Appendix G

Hydrology and Water Quality
Technical Study

Hydrology and Water Quality Technical Study For Arrow Commerce Center

RICK Job No.19871-A
February 21, 2024

RICK

HYDROLOGY AND WATER QUALITY TECHNICAL STUDY

FOR

ARROW COMMERCE CENTER PROJECT

Job Number 19871-A

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1.0 INTRODUCTION

This hydrology and water quality technical report has been prepared to support the proposed improvements of the Arrow Commerce Center (herein referred to as "the project"). This document has been prepared to summarize preliminary hydrologic and water quality analyses performed by others, which have been performed to support the planning and design of the project. This report evaluates the findings of those reports in context of the Environmental Checklist Form found in Appendix G of the State California Environmental Quality Act (CEQA) Guidelines (2023) and discusses the applicable local, State, and federal agencies, laws, and regulation requirements. It also identifies the regulatory background for future development to mitigate potential impacts to hydrology and water quality from the project. The qualitative descriptions of the hydrologic setting of the site, general drainage characteristics and storm water quality management provided in this report are based on technical reports relevant to the project area. These reports include "Preliminary Hydrology Calculations for Arrow Route and Juneberry Drive Industrial Development", prepared by Thienes Engineering, dated November 9, 2024 (herein referred to as "Hydrology Report"), and "Preliminary Water Quality Management Plan (PWQMP) For Arrow Route and Juneberry Drive", prepared by Thienes Engineering, dated May 18, 2023 (herein referred to as "PWQMP"). RICK Engineering Company has provided review comments on these reports that are anticipated to be incorporated by the applicant's team during the design process.

1.1 Project Description

The project site is located along the south side of Arrow Route between Interstate 15 and Etiwanda Avenue, in the City of Rancho Cucamonga, County of San Bernardino, California. The project site is bounded by Arrow Route to the north, industrial land uses to the east, the Atchison Topeka and Santa Fe Railway (AT/SF Railway) to the south, and industrial manufacturing and undeveloped land uses to the west. A vicinity map of the project location is provided in the Hydrology Report in Appendix A as well as Appendix D.

The project is located within the Neo-Industrial and Industrial Employment Districts, and will be developed for industrial use. Proposed improvements include the construction of three (3) industrial buildings along Arrow Route, two (2) warehouse buildings to the south, loading docks for truck trailers, 922 automobile parking spaces, 424 truck trailer parking spaces, modifications to onsite drive aisles and parking lots, the creation of a new vehicle circulation system, underground water quality basins and storm drain improvements.

1.2 FEMA Flood Hazard Zone Information

The watercourses around the project have been studied by the Federal Emergency Management Agency (FEMA), and no portion of the project site is shown in a FEMA defined floodplain or floodway. The project site is shown on the FEMA Flood Insurance Rate Map (FIRM) numbers 06071C8635J, effective September 26, 2014, 0671C8634J, effective September 26, 2014, and 06071C8633J, effective September 2, 2016. These maps are provided in Appendix C for reference. The entirety of the site is labeled as Zone X (unshaded) as an area of minimal flood hazard.

1.3 Hydrology and Drainage Characteristics

The project site is generally divided into two distinct drainage basins. The eastern portion of the site drains southeasterly, while the western portion of the site drains southwesterly. Both discharge points are along the southern property line. The project site is subject to stormwater run-on from an offsite area of approximately 14 acres, which drains from the north through the eastern portion of the project. A simplified drainage map with the main drainage basins, discharge points, and other hydrologic and hydraulic features can be found in Appendix D.

The project is within an industrial area, encompassing approximately 94.3 acres. At the time of the development of this technical report there is no existing development or buildings within the pre-project condition of the site. The project is comprised of pervious, barren soil, as it exists of November 1, 2023. Historically (aka prior to being cleared) the project site was generally developed with buildings, stockpiles and paved surfaces. Landscape in the historic condition was limited to the area surrounding the building in the northeast corner, and approximately 45% of the site was pervious, barren soil. In the pre-project condition, the eastern drainage basin drains southernly through a series of open channels and closed conduits until it reaches an existing detention basin near the southeastern corner of the project. The detention basin discharges via a 24" storm drain, and continues southeasterly under the railroad, ultimately discharging to the Etiwanda Channel. Runoff from the western drainage basin drains southwesterly from the previously existing building along Arrow Route and the associated parking/storage towards an existing catch basin in the southwest corner of the project. There are three existing storm drain systems in the pre-project condition, that collect and convey flows from the westerly drainage basin southwesterly and offsite.

In the post-project condition, the drainage characteristics will remain similar as compared to the pre-project condition. Most of the site will be impervious, with proposed impervious features, including five buildings, roadway improvements, and parking improvements. The project proposes 42 acres of streets and buildings, 44 acres of new public streets and 8 acres of landscaping. Runoff from Buildings 1-4 will drain southwest where low flows are directed into a proposed storm drain system leading to underground CMP retention facilities. Larger flows will be detained in truck yards and continue southwesterly to a proposed headwall. The detained flows will leave the project site, be conveyed under the railroad via an existing culvert, and continue south. Low flows associated with Building 5 will drain southeast into a proposed storm drain system leading to an underground CMP detention system with proprietary biofiltration for water quality treatment, and larger flows will be detained in truck yards to mimic historic/pre-project condition flow patterns and continue southeasterly to a proposed headwall. The detained flows will leave the project site, be conveyed under the railroad via an existing culvert, and continue south. The post-project condition proposes two storm drain systems to collect onsite and offsite runoff, as well as Low Impact Development (LID) Infiltration, Biofiltration and Self Retaining Best Management Practices (BMPs) which will be designed to provide water quality treatment and to reduce storm water discharge volume. The precise locations of the buildings and BMPs are provided in the PWQMP Drainage Map by Thienes Engineering, provided in Appendix B for reference.

Preliminary hydrologic calculations were prepared by Thienes Engineering in accordance with the San Bernardino Hydrology Manual, dated August 1986 for the purpose of comparing historic and post-project flow rates. Details of the methodology and results of the hydrologic analysis are provided in Section 2.0.

1.4 Water Quality

The County of San Bernadino has a stormwater program that requires all new development and significant redevelopment projects to incorporate measures ensuring water quality by adhering to the county guidance document titled, "The San Bernardino County Stormwater Program Technical Guidance Document for Water Quality Management Plans", with an effective date of June 7, 2013, herein referred to as "TGD for WQMPs". According to the TGD for WQMPs, the project is considered a Priority Project and obligated to implement water quality measures pursuant to the said guidance document. All proposed impervious surfaces will be subject to water quality requirements. The post-project condition proposes seven (7) LID Infiltration BMPs, one LID Bioretention BMP and one LID Self-Retaining BMP to provide water quality treatment. In addition, there are multiple proposed structural source control BMPs. The project falls within an HCOC Exemption Area and is therefore not subject to hydromodification requirements. Details of Water Quality are provided in Section 3.0.

2.0 HYDROLOGY

The purpose of the hydrologic analysis at the preliminary level was to determine the approximate overall design discharges for the project site for comparative purposes for the historic/pre-project condition and post-project condition. Calculations were prepared for the 100-year storm event.

2.1 Methodology and Criteria

Preliminary hydrologic calculations were prepared in accordance with the guidance document title, "San Bernardino County Hydrology Manual," dated August 1986. The Hydrowin Advanced Engineering Software (AES) 2016 Rational Method Analysis (Version 23.0) program was used to perform the hydrologic analysis in this study.

The AES hydrologic model is developed by creating independent node-link models of each interior drainage basin and linking these sub-models together at confluence points. The program has the capability to perform calculations for 15 hydrologic processes. These processes are assigned code numbers that appear in the results. The code numbers and their significances are as follows:

Subarea Hydrologic Processes (Codes)

Code 1:	Confluence analysis at a node
Code 2:	Initial subarea analysis
Code 3:	Pipe flow travel time (computer-estimated pipe sizes)
Code 4:	Pipe flow travel time (user-specified pipe size)
Code 5:	Trapezoidal channel travel time
Code 6:	Street flow analysis through a subarea

Code 7: User-specified information at a node
Code 8: Addition of the subarea runoff to mainline
Code 9: V-Gutter flow through a subarea
Code 10: Copy main-stream data onto a memory bank
Code 11: Confluence a memory bank with the main-stream memory
Code 12: Clear a memory bank
Code 13: Clear the main-stream memory
Code 14: Copy a memory bank onto the main-stream memory
Code 15: Hydrologic data bank storage functions

In order to perform the hydrologic analysis, base information for the study area is required. This information includes the drainage facility locations and sizes, land uses, flow patterns, drainage basin boundaries, and topographic elevations. Compiled hydrologic backup performed by Thienes Engineering is included in Appendix A of this report.

Area and Topography

Watersheds / major drainage basin boundaries were delineated to distinguish areas with similar flow characteristics and hydrologic properties as well as to determine peak flows for comparative analysis. Drainage basin boundaries, flow patterns, and topographic elevations are shown on the hydrologic workmaps for the site, prepared by Thienes Engineering, included in Appendix A of this report.

Time of Concentration/Intensity

The time of concentration was calculated using AES for the 100-year storm events. The rainfall intensity was calculated in AES using the relevant intensity values for the project area using the San Bernadino County Hydrology Manual Isopluvial Maps and Intensity-Duration Curves. A supporting annotated chart, prepared by Thienes Engineering, has been included in Appendix A.

Runoff Coefficient

In the historic project condition, the site contains approximately 45% impervious area and is found to be a “commercial poor cover” condition. As it exists as of November 2023, the site contains 0% impervious area. Hydrologic soil group data is available for the site through the San Bernardino County Hydrology Manual, showing the site consisting of type “A” soils. In the post-project condition, impervious area is added bringing the overall impervious percentage to approximately 93%.

The runoff coefficients used for each minor basin were calculated by the AES software based on the user-entered information of the hydrologic soil group and the land use for each basin. The percentage of impervious area in each subdrainage area was used to determine the land use entered within AES. Supporting information for parameters assigned to AES calculations is included with Appendix A of this report.

2.2 Hydrologic Results

Hydrologic calculations and supporting materials prepared by the engineer of work are provided in Appendix A for reference. The hydrologic results for the historic and post-project conditions are summarized in Table 2.1.

Table 2.1: 100-Year Peak Flow Discharge Rates [8]

Drainage Basin (D.B.) ID	Historic		Post-Project (Unmitigated)		Post-Project (Mitigated)	
	Total Area (acres)	Estimated Peak Flow Rate (cfs)[1]	Total Area (acres)	Estimated Peak Flow Rate (cfs)[1]	Total Area (acres)	Estimated Peak Flow Rate (cfs)[1]
Western D.B.	61.1 [3]	147.9 [3]	62.5 [4]	209.1 [4]	62.5 [6]	143.6 [6]
Eastern D.B.	49.4 [2]	128.1 [2]	46.9 [5]	149.8[5]	46.9 [7]	130.5 [7]

Note:

1: cfs = cubic feet per second

2: The area and flowrate for this basin in the existing condition are tributary to nodes 102 and 226 of the Thienes Engineering AES existing condition calculations, provided in Appendix A.

3: The area and flowrate for this basin in the existing condition are tributary to node 314 of the Thienes Engineering AES existing condition calculations, provided in Appendix A.

4: The area and flowrate for this basin in the proposed condition are tributary to nodes 138, 153, 154, 166. 167. 168 and 169 of the Thienes Engineering AES proposed condition calculations, provided in Appendix A.

5: The area and flowrate for this basin in the proposed condition are tributary to nodes 216, 226, 238, 239 and 255 of the Thienes Engineering AES proposed condition calculations, provided in Appendix A.

6: The area and flowrate for this basin in the proposed condition are tributary to nodes 138, 153, 154, 166. 167. 168 and 169 of the Thienes Engineering AES proposed condition with detention calculations, provided in Appendix A.

7: The area and flowrate for this basin in the proposed condition are tributary to nodes 216, 226, 238, 239 and 255 of the Thienes Engineering AES proposed condition with detention calculations, provided in Appendix A.

8: The total area in the proposed condition is less than the historic condition as it does not account for 1.1 Acres of landscaping that drains directly offsite in the proposed condition.

3.0 WATER QUALITY

The project site is located in the Santa Ana Region of San Bernardino County and is subject to the requirements of the Santa Ana Regional Water Quality Control Board (RWQCB). The project is defined as a "Priority Project", per table 1-1, section 1.5.1 of San Bernardino County Stormwater Program Technical Guidance Document for Water Quality Management Plans, dated June 7, 2013, as the proposed improvements include the addition or replacement of 5,000 square feet or more of impervious surface on an already developed site. Therefore, a project-specific WQMP is required for the project site at the preliminary stage, and structural treatment control BMPs are required. Hydromodification management measures do not need to be addressed as the project falls within an HCOC exempt area.

3.1 Preliminary Water Quality Features

The historic project site included approximately 2,182,701 square feet of impervious surfaces. In the pre-project condition, as it exists in November 2023, there are no impervious surfaces within the project area. In the post-project condition, the project proposes approximately 3,746,160 square feet (86 acres) of new impervious surfaces. All proposed impervious surfaces will be subject to water quality requirements.

Based on the PWQMP prepared by Thienes Engineering, included as Appendix B of this report, structural LID BMPs are proposed to be implemented onsite. Infiltration BMPs have been proposed in seven (7) locations: one adjacent to Building 1, two adjacent to Building 2, one adjacent to Building 3, two adjacent to Building 4 and one adjacent to Building 5. The locations of the buildings and BMPs are provided in the Drainage Map in Appendix B. Flows from these areas will be directed to perforated underground CMP facilities for infiltration. A Biofiltration BMP has been proposed at one location in the southeastern portion of the project, as infiltration was deemed infeasible due to pollutants in the soil. This BMP consists of solid underground CMP facilities for detention and proprietary biotreatment units. Modular wetlands have been selected for the biofiltration units.

Approximately 3.2 acres of landscaping along the perimeters of the project site will discharge directly off the site and not be routed to the LID BMPs. This area is considered self-treating. In addition to the LID BMPs, there will be multiple structural source control BMPs. Drain inserts at each catch basin will serve as pre-treatment. Supporting information regarding the selected BMPs can be found in Appendix B.

4.0 REGULATORY SETTINGS

4.1 Federal

Water Pollution Control Act (Clean Water Act)

The Federal Water Pollution Control Act Amendments were enacted in 1972. As amended in 1977, this law became commonly known as the Clean Water Act (CWA). The Act established basic guidelines for regulating discharges of pollutants into "waters of the United States." The CWA requires that States adopt water quality standards to protect public health; to enhance the quality of water resources; and to ensure implementation of the CWA.

- **Section 401.** Section 401 of the CWA requires an applicant for a federal permit (such as for the construction or operation of a facility that may result in the discharge of a pollutant) to obtain certification of those activities from the state in which the discharge originates. This process is known as the Water Quality Certification (WQC) for the Proposed Project. For projects in southeastern San Bernardino County, the Santa Ana RWQCB issues the Section 401 WQC.

- **Section 402**. Section 402 of the CWA established the National Pollution Discharge Elimination System (NPDES) to control water pollution by regulating point sources that discharge pollutants into "waters of the United States." For the State of California, the USEPA has authorized the SWRCB permitting authority to implement the NPDES program. In general, the SWRCB issues two storm water NPDES general permits: one for industrial discharges and one for construction activities. The Phase II Rule, which became final on December 8, 1999, expanded the existing NPDES program to address storm water discharges from construction sites that disturb land equal to or greater than one acre.

- **Section 404**. Section 404 of the CWA established a permitting program to regulate the discharge of dredged or filled material into "waters of the United States." The definition of "waters of the United States" includes wetlands adjacent to national waters. This permitting program is administered by the U.S., Army Corp of Engineers (USACE) and is enforced by the USEPA.

- **Section 303(d).** Under Section 303(d) of the CWA, the SWRCB is required to develop a list of water quality limited segments for jurisdictional "waters of the United States." The RWQCBs are responsible for establishing TMDLs and TMDL priority rankings as well as for developing action plans to improve water quality of waterbodies included on the 303(d) list. The most recent 303(d) List of Water Quality Limited Segments approved by the USEPA is from the 2010 Integrated Report. This document references the 2010 list. The list includes pollutants causing impairment to receiving waters or, in some cases, the condition leading to impairment.

Safe Drinking Water Act

Under the Safe Drinking Water Act (SDWA) [Public Law 93-523] of 1974, the USEPA regulates contaminants of concern to domestic water supply. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by the USEPA primary and secondary Maximum Contaminant Levels (MCLs) that are applicable to treated water supplies delivered to the distribution system. MCLs and the process for setting these standards are reviewed triennially. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. The SDWA authorizes three EPA ground water protection activities: the Underground Injection Control (UIC) regulatory program, the Sole Source Aquifer (SSA) designation program, and the Source Water Assessment and Protection (SWP) program, which includes Wellhead Protection. The Proposed Project does not involve underground injection, does not cross any designated SSA, and does not involve the construction and operation of a public water supply well, which would require a Drinking Water Source Assessment and Protection Program evaluation.

Executive Order 11988 "Floodplain Management" and the Federal Emergency Management Agency

Under Executive Order 11988 "Floodplain Management", the Federal Emergency Management Agency (FEMA) is responsible for managing floodplain areas. FEMA administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. The design standard for flood protection is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (i.e., the 100-year flood event).

4.2 State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act of 1967 (California Water Code, Section 13000 et seq.) is directed primarily towards the control of water quality. The Porter-Cologne Act provides for protection of the quality of all "waters of the State" for use and enjoyment by the people of California. It further provides that all activities that may affect the quality of "waters of the State" shall be regulated to obtain the highest water quality that is reasonable, considering all demands being made and to be made on those waters. The Porter-Cologne Act also establishes provisions for a statewide program for the control of water quality, recognizing that "waters of the State" are increasingly influenced by interbasin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally in the state. The Porter-Cologne Act establishes the SWRCB and its nine RWQCBs as the principal state agencies responsible for control of water quality. As such, each regional board is required to formulate and adopt a Basin Plan, which designates beneficial uses and establishes water quality objectives to protect these beneficial uses. The Project area is

under the jurisdiction of the Santa Ana RWQCB. Beneficial uses and water quality objectives for these areas are established by the 1995 (as amended through 2011) Water Quality Control Plan for the Santa Ana River Basin.

Construction General Storm Water Permit

Under Section 402 of the CWA, construction-related storm water discharges to surface waters are regulated through the NPDES program. The California SWRCB has been delegated the authority by the USEPA to oversee the NPDES program through the RWQCBs. Under this authority, the SWRCB has developed a general permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities Order No. 2022-0057-DWQ (Construction General Permit). Construction of the proposed project would disturb an area greater than one acre; therefore, the proposed project must receive coverage under the Construction General Permit. The proposed project area is under the jurisdiction of the Santa Ana RWQCB. This RWQCBs will therefore require notification of the proposed project's intention to carry out activities under the Construction General Permit. Operation under the Construction General Permit would require preparation of a Storm Water Pollution Prevention Plan (SWPPP).

4.3 Local

San Bernardino County Flood Control District

The San Bernardino County Flood Control District (SBCFCD) was enacted under California State legislation in 1939. The District developed an extensive network of flood-control facilities, including dams, conservation basins, channels, and storm drains. These facilities are designed to intercept and convey flood flows through and away from major developed areas in the County. The SBCFCD's primary functions are flood protection on major streams, water conservation, and storm drain construction. If applicable, encroachment permits for flood-channel crossings or any work within the District's right-of-way will need to be obtained from the SBCFCD.

Areawide Urban Storm Water Runoff (National Pollutant Discharge Elimination System Permit No. CAS618036)

Together with co-permittees, San Bernardino County participates in an areawide urban storm water runoff management program covered under NDPES Permit No. CAS618036. This permit regulates the discharge of pollutants in urban runoff from non-agricultural human sources from the MS4s under the jurisdiction or responsibility of the co-permittees. This permit requires that co-permittees ensure that all non-co-permittee construction sites that are greater than one-acre file a Notice of Intent with the SWRCB for coverage under the State's Construction General Permit. Co-permittees must also ensure that the erosion and sediment control plans approved incorporate appropriate erosion and sediment control BMPs and that the runoff from new development projects do not cause a nuisance to adjoining or downstream properties in stream channels to the maximum extent practicable. The permit also outlines potential water quality impacts that should be considered as part of the California Environmental Quality Act (CEQA) evaluation. New developments that create 10,000 square feet or more of impervious surface collectively over the entire project site are required to develop project-specific Water Quality Management Plans. The Water Quality Management Plans must include BMPs for source control, pollution prevention, site design, Low Impact Design (LID) implementation (where feasible), structural treatment-control BMPs, and control measures for any listed pollutant to an impaired waterbody on the 303(d) list.

County of San Bernardino 2007 General Plan

In accordance with the County of San Bernardino 2007 General Plan, the potential impact of a project's construction on storm water runoff should be considered during CEQA review. This review should consider the potential for discharging storm water pollutants from areas of material storage, vehicle or equipment fueling or maintenance, waste handling, hazardous materials storage, and other outdoor work areas. The review should also consider the potential for the discharge of storm water to affect beneficial uses of receiving waters and/or change the flow velocity of storm water runoff volume to cause environmental harm or significant increases in erosion on the project site or surrounding areas.

5.0 CEQA

In accordance with The National Pollutant Discharge Elimination System (NDPES) Permit and Waste Discharge Requirements for the San Bernardino County Flood Control District, dated January 29, 2010, this study evaluated the California Environmental Quality Act (CEQA) potential for adverse environmental impacts by providing responses to the following questions:

Would the project:

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?
   - The proposed project will not violate any water quality standards or waste discharge requirements. There is potential for water quality standards to be violated during site clearing, grading and excavation, building construction, paving and landscaping, and architectural coatings which could result in the generation of water quality pollutants such as silt, debris, chemicals, paints, and other substances with the potential to adversely affect water quality in the absence of protective or avoidance measures. The proposed project will be required to comply with existing National Pollutant Discharge Elimination System (NPDES) requirements, however, by implementing a Storm Water Pollution Prevention Plan (SWPPP), as required for all projects larger than one acre in size. As part of the SWPPP, the use of Best Management Practices (BMPs) during each construction phase will be identified. BMPs are measures that are to be used to reduce pollutants in storm water runoff. Post-Construction stormwater management will be addressed by a project-specific Water Quality Management Plan (WQMP). Based on the preliminary WQMP (PWQMP), seven Infiltration BMPs, one Proprietary Bioretention BMP, and drain inlet inserts will be used to capture runoff generated by proposed improvements to treat, retain, and discharge flows mimicking historic/pre-project conditions. It should be noted that the PWQMP reviewed for this technical report implies that the onsite roadways are not directly treated before discharging the project site, which could adversely affect water quality. However, the project must adhere to the City's stormwater quality requirements, and it is anticipated that by incorporating comments from the City over the course of final design, the proposed design would meet all requirements with the final submittal.

b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?
   - The proposed project will not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. The project is proposing to increase the amount of impervious area from the historical percentage of 45% to 93% of the site, which would limit the amount of stormwater infiltrating the ground. To combat this, several infiltration BMPs will be implemented, which will adhere to the requirements of the TGD for WQMPs. It is understood that a Water

Supply Assessment is being prepared by others to determine if the project will generate a significant water demand.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would

i. Result in substantial on- or off-site erosion or siltation?

- The proposed project will not significantly alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site. The greatest potential for erosion or siltation may occur during the project construction phase. However, as the project site is larger than one acre in size a SWPPP will be prepared in accordance with NPDES requirements specifying construction BMPs for erosion and sediment control.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

- The proposed project will not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. Standard conditions of approval, such as the City's flood control requirements for new development, would minimize the effects of increased flows and volumes on downstream receiving waters (Rancho Cucamonga General Plan DEIR 2021: 5.10-20). Based on the provided preliminary detention analysis the overall proposed project is not anticipated to generate a substantial increase in runoff as compared to the existing conditions, therefore it is not anticipated to result in flooding on-site or off-site.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

- The proposed development will not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. In the existing condition, there are no BMPs. For the portion of the project that proposes an increase of impervious surfaces, the project proposes seven Infiltration BMPs with retention facilities and one Proprietary Bioretention BMP with detention facilities to capture runoff generated by proposed improvements to treat, retain, and discharge flows mimicking historic/pre-project conditions. In accordance with the TGD for WQMPs, areas unfit for infiltration, such as areas previously exposed to hazardous materials, will not utilize Infiltration BMPs. In addition, drain inserts will be implemented at catch basins for pretreatment. The overall proposed project is not anticipated to generate a substantial increase in runoff as compared to the existing conditions. The proposed project would comply with all existing City drainage requirements; therefore, it is not anticipated to

contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems. The proposed project would comply with existing NPDES requirements, including the preparation of a SWPPP as required for all projects larger than one acre in size. As part of the SWPPP, the use of temporary BMPs will be identified as measures that are to be used to reduce pollutants in storm water runoff, therefore the project is not anticipated to provide substantial additional sources of polluted runoff.

iv. Impede or redirect flood flows?

- The project will not impede or redirect flows. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) panel numbers 06071C8635J, effective September 26, 2014, 06071C8634J, effective September 26, 2014, and 06071C8633J, effective September 2, 2016, the entirety of the site is labeled as Zone X (unshaded). Zone X indicates the area is of minimal flood hazard and determined to be outside the 100-Year Floodplain, the 500-Year Floodplain, and the 500-Year Floodplain Protected by Levee. The City of Rancho Cucamonga General Plan shows the project site close to the Flood Control/ Utility corridor for Day Creek, but it is not within it.

d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?
   - The project site is not subject to inundation by flood hazard, tsunami, or seiche zones. The proposed project is not close to a large land-locked body of water and therefore not subject to a seiche. The proposed project is a significant distance from the Pacific Ocean and therefore not subject to a tsunami. The proposed project does not receive a significant amount of off-site run-on associated with mudflows.

e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The proposed project will not obstruct implementation of a water quality control plan or sustainable groundwater management plan. The Chino Basin underlies the project site and is an adjudicated basin subject to the Sustainable Groundwater Management Act. A Water Supply Assessment is being prepared by others to determine if the project will generate a significant water demand. According to the preliminary WQMP, several infiltration BMPs will be implemented in accordance with the TGD for WQMPs. As discussed in responses to Items c) and e), the proposed project would comply with existing NPDES requirements, including the preparation of a PWQMP, a SWPPP and inclusion of BMPs to reduce pollutants in storm water runoff. The project features and uses have no additional effects to water quality.

6.0 Summary and Conclusion

This combined Hydrology and Water Quality Technical Report reviewed two preliminary engineering reports relevant to the Arrow Route Commerce Center Project, prepared by Thienes Engineering. This report evaluates the findings of those reports in the context of the Environmental Checklist Form found in Appendix G of the State California Environmental Quality Act (CEQA) Guidelines and identifies how the future development intends to mitigate potential impacts to hydrology and water quality from the project. RICK Engineering Company has separately provided review comments on the preliminary engineering reports that are anticipated to be incorporated by the applicant's team during the design process.

7.0 References

City of Rancho Cucamonga, 2023. *General Plan Update & Climate Action Plan Draft Environmental Impact Report.* September 2021

FEMA, 2014. *Flood Insurance Rate Map (FIRM) 06071C8635J*. September 2014.

FEMA, 2016. *Flood Insurance Rate Map (FIRM) 06071C8633J*. September 2016.

FEMA, 2016. *Flood Insurance Rate Map (FIRM) 06071C8634J*. September 2016.

County of San Bernardino, 2013. *Technical Guidance Document for Water Quality Management Plans.* September 2013.

Thienes Engineering, 2024. *Preliminary Hydrology Calculations for Arrow Route and Juneberry Drive Industrial Development.* November 2024.

Thienes Engineering, 2023. *Preliminary Water Quality Management Plan (PWQMP) for Arrow Route and Juneberry Drive Industrial Development.* May 2023.

Appendix A

Preliminary Hydrology Calculations
for Arrow Route and Juneberry Drive Industrial Development

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

PRELIMINARY HYDROLOGY CALCULATIONS

FOR

ARROW ROUTE AND JUNEBERRY DRIVE
INDUSTRIAL DEVELOPMENT
RANCHO CUCAMONGA, CA

PREPARED FOR

BLACK CREEK GROUP
4675 MAC ARTHUR COURT, STE 625
NEWPORT BEACH, CA 92660
P. (949) 892-4900

MAY 8, 2023
REVISED NOVEMBER 9, 2023

JOB NO. 4021

PREPARED BY

THIENES ENGINEERING
14349 FIRESTONE BLVD.
LA MIRADA, CALIFORNIA 90638
P. (714) 521-4811
FAX (714) 521-4173

PRELIMINARY HYDROLOGY CALCULATIONS

FOR

ARROW ROUTE AND JUNEBERRY DRIVE INDUSTRIAL DEVELOPMENT

PREPARED UNDER
THE SUPERVISION OF:

REINHARD STENZEL DATE
R.C.E. 56155
EXP. 12/31/2024

INTRODUCTION

A: PROJECT LOCATION

The project site is located along the south side of Arrow Route between Interstate 15 and Etiwanda Avenue, in the City of Rancho Cucamonga, California. Please see following page for vicinity map.

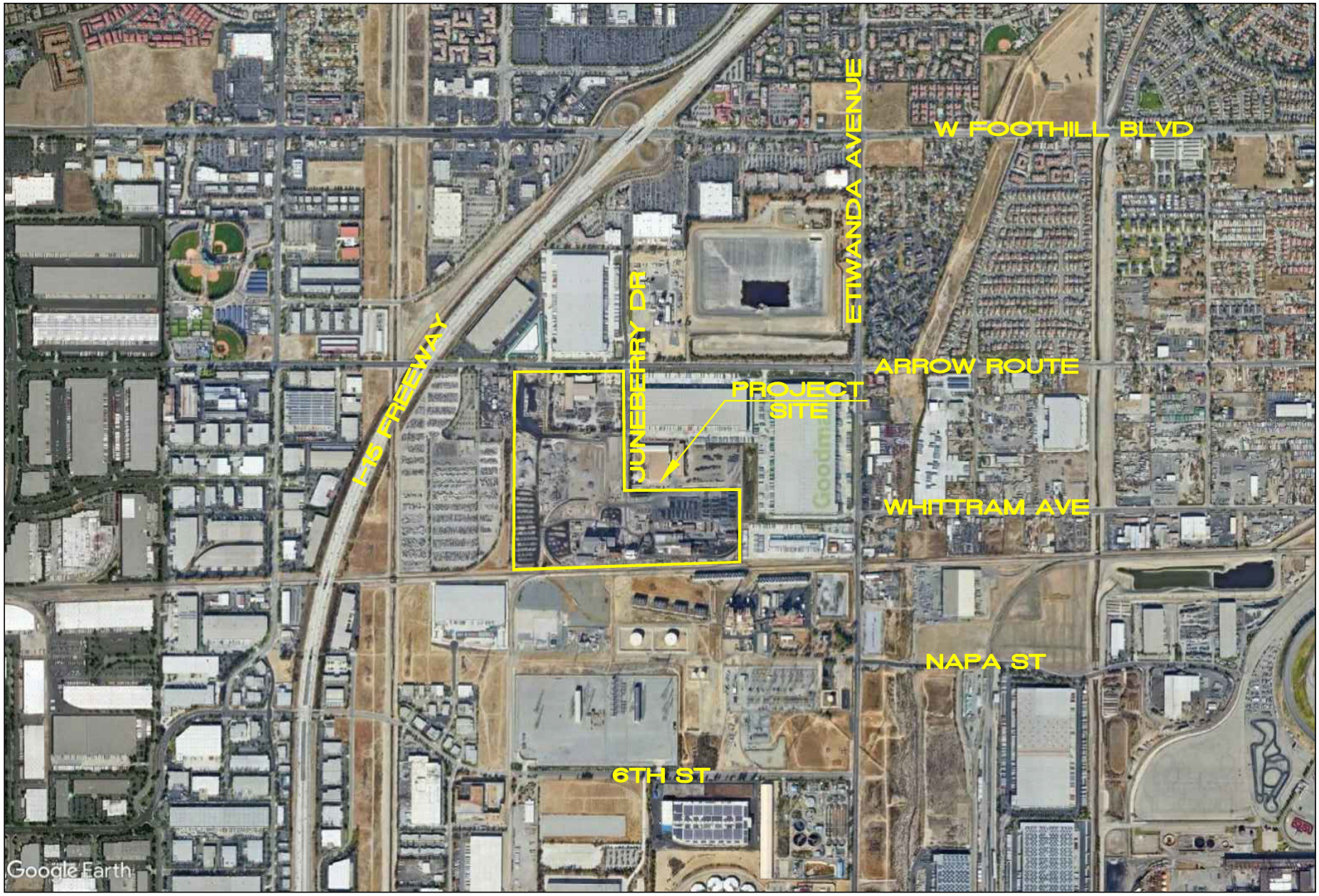
B: STUDY PURPOSE

The purpose of this study is to determine the existing and proposed condition 100-year peak flow rate from the site that drains southerly to two different discharge points which are conveyed southerly under the existing railroad.

C: PROJECT STAFF:

Thienes Engineering staff involved in this study include:

Reinhard Stenzel
Brian Weil



Last Update:11/8/21
O:\4000-4099\4021\4021VicMap.dwg

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

VICINITY MAP

FOR

ARROW ROUTE AND JUNEBERRY DRIVE
RANCHO CUCAMONGA, CA

N

NTS

DISCUSSION

The project site encompasses approximately 96.50 acres. There is an additional approximate 14.0 acres of offsite area that is tributary to the project site. The existing condition is generally developed with buildings, stockpiles, and paved surfaces. Landscape in the existing condition is limited to the area surrounding the building in the northeast corner.

Proposed improvements to the site consist of three building along Arrow Route and two larger warehouse type buildings to the south. The warehouse buildings will have truckyards along both sides. Vehicle parking is generally along the permitter of the projects.

Off-Site Drainage

There is an existing warehouse type building and storage yard north of the proposed building 5 that drains to the project site. In the existing condition, this area drains southerly to a swale which conveys low flows easterly. High flows appear to top the swale and continue south. In the proposed condition, several drainage inlets will be provided along the property line to intercept the drainage into the proposed storm drain system.

Existing Condition

The project site is generally divided into two distinct drainage zones. The eastern portion of the site drains southeasterly, while the western portion of the site drains southwesterly. Both discharge points are along the southern property line.

North of the eastern portion of the project site, offsite area drains to a channel along the northern property line (Nodes 100-102, 11.8 acres). The channel doesn't discharge to a single location, but rather overtops and spills to the project site. The 100-year peak flow rate for this offsite area is approximately 29.9 cfs.

The eastern drive aisle from Arrow Route drains southerly through a series of open channels and underground conduits to the southeast portion of the site (Nodes 200-226, 37.6 acres). There is an existing detention basin near the southeast property corner. Runoff is discharged from this basin via a 24" storm drain which daylights out a head wall and continues southeasterly following the existing drainage pattern offsite. The runoff is then conveyed under the railroad and continues southerly. The 100-year peak flow rate for the eastern portion of the site is approximately 98.2 cfs.

The west portion of the site drains southerly towards the southwest corner of the project site (Nodes 300-314, 61.1 acres). Here the runoff from the existing building along Arrow route and the associated parking/storage areas drain southwesterly towards an existing catch basin. An existing storm drain conveys this runoff westerly and southerly towards an existing headwall into a small basin. The runoff from the areas south of the existing building drains southwesterly towards the southwest corner of the site. The runoff is then conveyed under the railroad and continues southerly. The 100-year peak flow rate for the western portion of the site is approximately 147.9 cfs.

See Appendix "B" for existing condition hydrology calculations and Appendix "D" for existing condition hydrology map.

Proposed Condition

Buildings 1 – 3, along Arrow Route, and Building 4, the westerly warehouse building, will drain to the southwest of the project site. The offsite area and Building 5, the easterly warehouse building, will drain to the southeast of the project site.

Drainage from the areas associated with Buildings 1 – 3, the drive aisle south of these buildings, and the western access road will be collected into a storm drain system and conveyed to a proposed headwall at the southwest portion of the project site (Nodes 100-138, 19.4 acres). The undetained flows will leave the project site, be conveyed under the railroad, and continue south. The 100-year peak flow rate for the Buildings 1 – 3 storm drain system is approximately 57.4 cfs.

Drainage from the areas associated with Building 4 will be collected into a storm drain system and conveyed to a proposed headwall at the southwest portion of the project site (Nodes 140-171, 43.1 acres). Storm flows in this storm drain system will be detained using both the west and east truck yards. The detained flows will leave the project site, be conveyed under the railroad, and continue south. The 100-year undetained peak flow rate for the Building 4 storm drain system is approximately 151.7 cfs.

Drainage from the areas associated with Building 5, Juneberry Drive, the eastern access road, and the southern access road will be collected into a storm drain system and conveyed to a proposed headwall at the southeast portion of the project site (Nodes 200-257, 46.9 acres). Storm flows in this storm drain system will be detained using both the south and north truck yards. The detained flows will leave the project site, be conveyed under the railroad, and continue south. The 100-year undetained peak flow rate for the Building 5 storm drain system is approximately 149.8 cfs.

See Appendix "B" for proposed condition hydrology calculations and Appendix "D" for proposed condition hydrology map.

Detention Analysis

Onsite storm flow detention will be utilized to reduce the proposed condition flow rate below the existing condition rate. The truck yard areas of Buildings 4 and 5 provide the storage volume, storm drain size restrictions reduce the discharge.

A small area unit hydrograph was established for the tributary area to the truck yards. A rating curve was developed using the available ponding in the truck yards for storage and an orifice equation for the reduced storm drain size discharge.

The discharge from the truck yard on the west side of Building 4 (Nodes 140-153, 25.5 acres) is reduced from 85.1 cfs to 44.6 cfs with the remaining volume temporarily stored in the truck yard at a depth of about 0.53'.

The discharge from the truck yard on the east side of Building 4 (Nodes 160-166, 15.7 acres) is reduced from 59.4 cfs to 35.2 cfs with the remaining volume temporarily stored in the truck yard at a depth of about 0.41'.

The discharge from the truck yard on the south side of Building 5 (Nodes 220-226, 11.3 acres) is reduced from 40.6 cfs to 27.6 cfs with the remaining volume temporarily stored in the truck yard at a depth of about 0.41'.

The discharge from the truck yard on the north side of Building 5 (Nodes 230-238, 8.9 acres) is reduced from 37.9 cfs to 23.9 cfs with the remaining volume temporarily stored in the truck yard at a depth of about 0.34'.

See Appendix "C" for detention calculations.

Summary

The following is a summary of the existing and proposed 100-year site runoff.

Existing Condition		
Node Number ()	Tributary Area (ac)	Q100 (cfs)
102	11.8	29.9
226	37.6	98.2
314	61.1	147.9
Total	110.5	276.0

Proposed Condition			
Node Number ()	Tributary Area (ac)	Unmitigated Q100 (cfs)	Mitigated Q100 (cfs)
138	18.7	57.4	57.4
153	25.5	85.1	44.6
154	0.2	0.8	0.8
166	15.7	59.4	35.2
167	0.4	1.4	1.4
168	0.6	2.2	2.2
169	0.6	2.0	2.0
216	7.5	19.8	19.8
226	11.3	40.6	27.6
238	8.9	37.9	23.9
239	0.8	3.2	3.2
255	17.2	56.0	56.0
Total	109.4	365.8	274.1

Note: There is 1.1 acres of landscape that drains to the south.

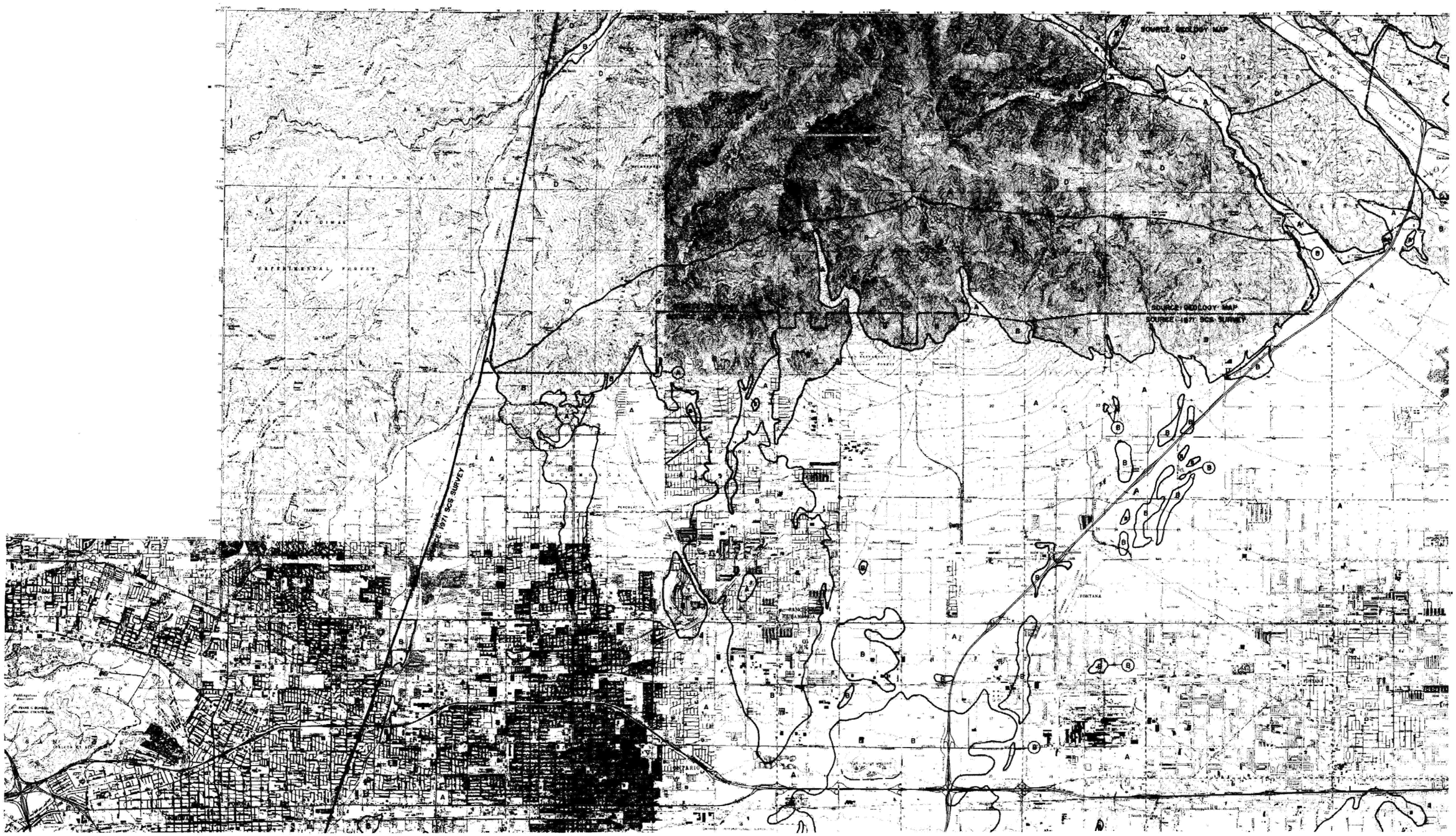
Methodology

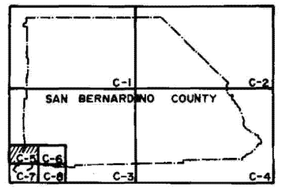
The hydrology calculations were computed using the San Bernardino County Rational Method Program (by AES software). The detention analysis was computed using the San Bernardino County Flood Routing Analysis (by AES Software). The soil type is “A” per the San Bernardino County Hydrology Manual.

APPENDIX	DESCRIPTION
A	REFERENCE MATERIALS
B	HYDROLOGY CALCULATIONS
C	DETENTION CALCULATIONS
D	HYDROLOGY MAPS

APPENDIX A

REFERENCE MATERIALS





INDEX MAP

LEGEND

SOIL GROUP BOUNDARY

A SOIL GROUP DESIGNATION

BOUNDARY OF INDICATED SOURCE

SCALE 1:48,000

SCALE REDUCED BY 1/2

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHWEST-A AREA

FIGURE C-13

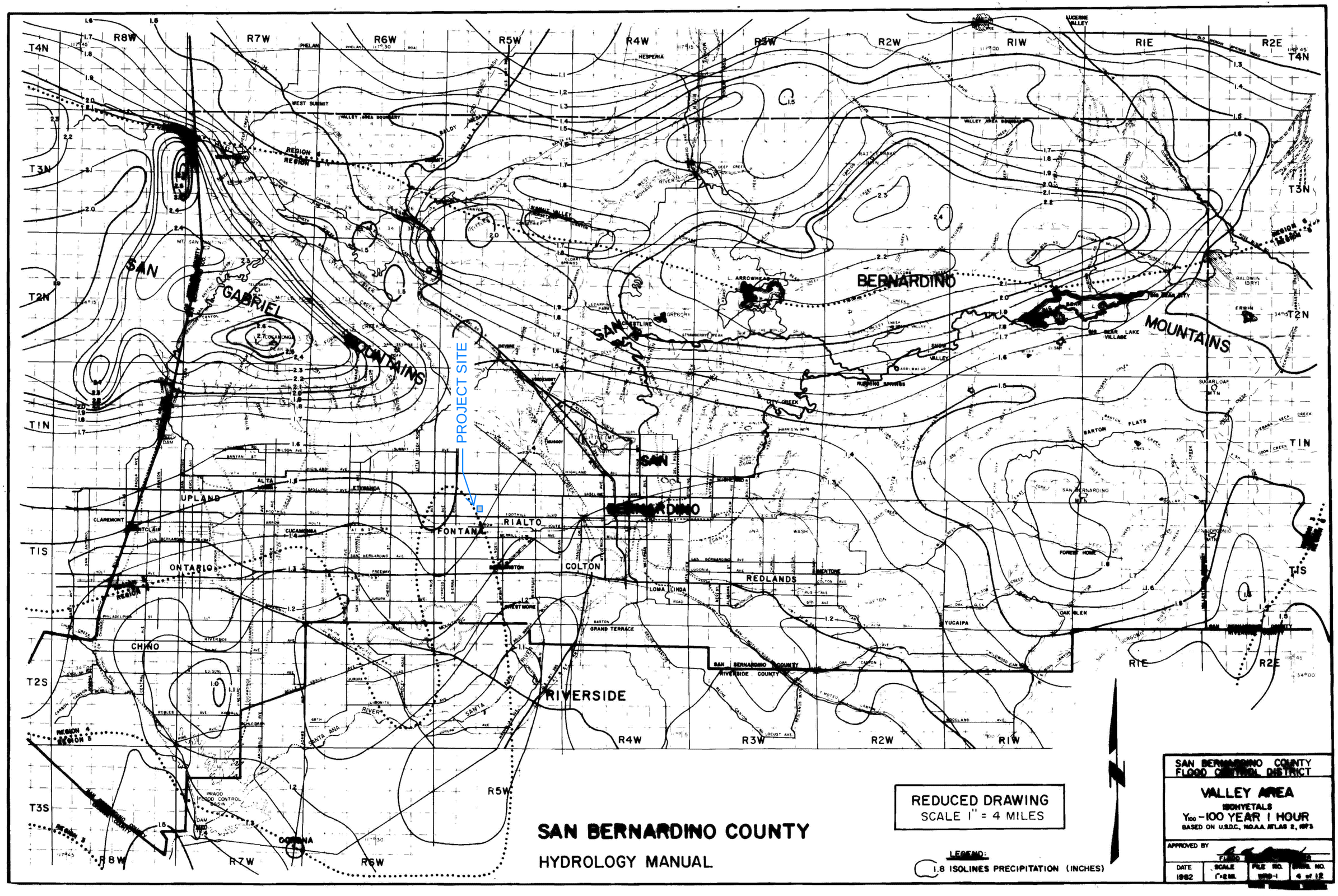

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL
REDUCED DRAWING
SCALE 1" = 4 MILES
LEGEND:
1.8 ISOLINES PRECIPITATION (INCHES)
PROJECT SITE
SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT
VALLEY AREA
ISOHYETALS
Y100 - 100 YEAR 1 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973
APPROVED BY
DATE 1982
SCALE 1"=2 MI.
FILE NO. 1980-1
DWG. NO. 4 of 12
SAN BERNARDINO MOUNTAINS
SAN GABRIEL MOUNTAINS
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
T4N
T3N
T2N
T1N
T1S
T2S
T3S

FIGURE B-4

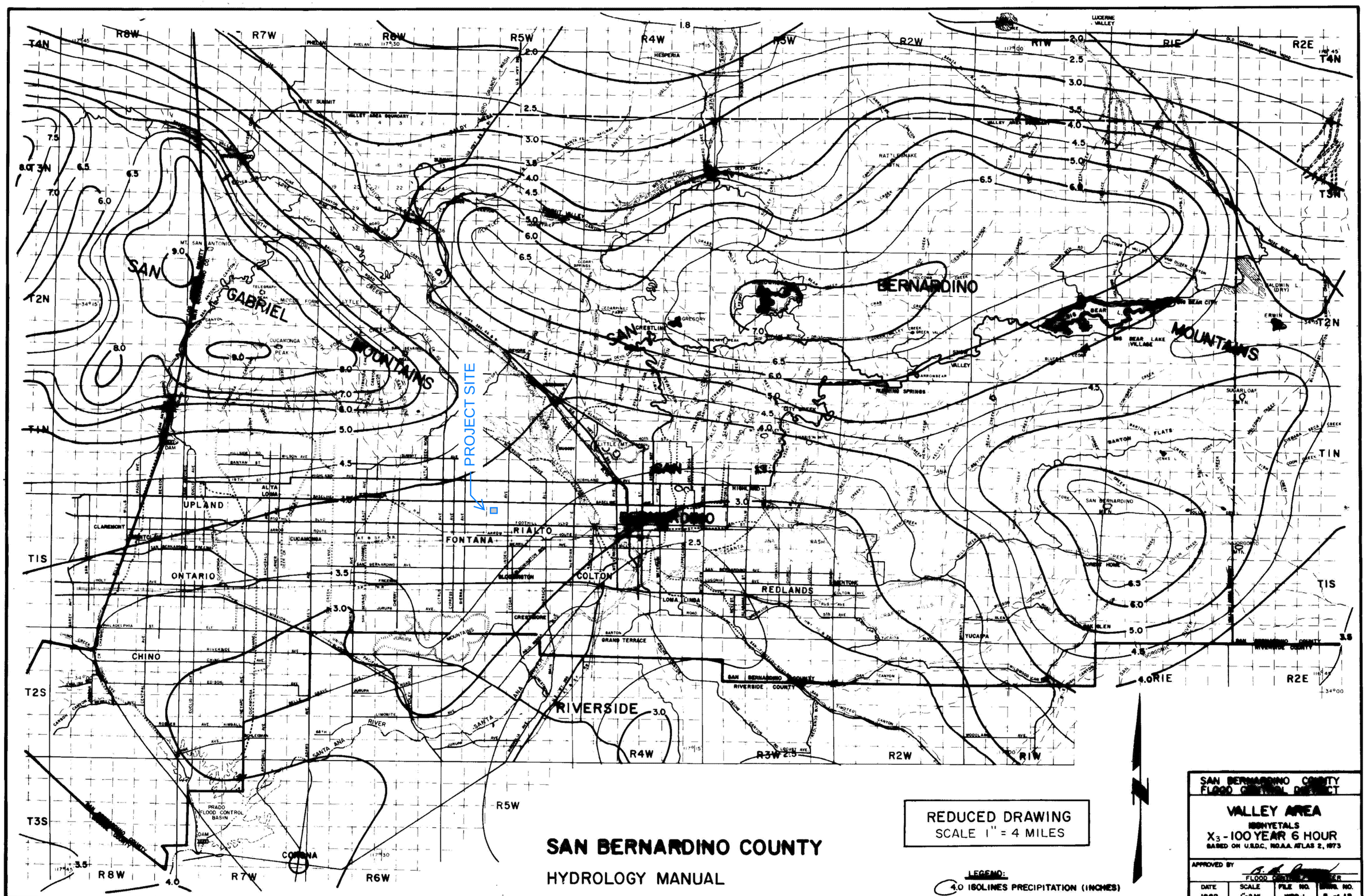

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL
REDUCED DRAWING
SCALE 1" = 4 MILES
LEGEND:
4.0 ISOLINES PRECIPITATION (INCHES)
PROJECT SITE
SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT
VALLEY AREA
ISOHYETALS
X3 - 100 YEAR 6 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973
APPROVED BY
DATE 1982
SCALE 1"=2 MI.
FILE NO. WRD-1
DWG. NO. 8 of 12
SAN GABRIEL MOUNTAINS
SAN BERNARDINO MOUNTAINS
SAN ANDREAS FAULT
SAN JACINTO FAULT
SAN BERNARDINO
RIVERSIDE
UPLAND
ONTARIO
CHINO
FONTANA
RIALTO
COLTON
REDLANDS
LOMA LINDA
CLAREMONT
CORONA
PRADO FLOOD CONTROL BASIN
SANTA ANA RIVER
MT. SAN ANTONIO
CUCAMONGA PEAK
BIG BEAR LAKE
BIG BEAR CITY
SAN BERNARDINO PEAK
SUGARLOAF MTN.
T4N
T3N
T2N
T1N
T1S
T2S
T3S
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E

FIGURE B-5

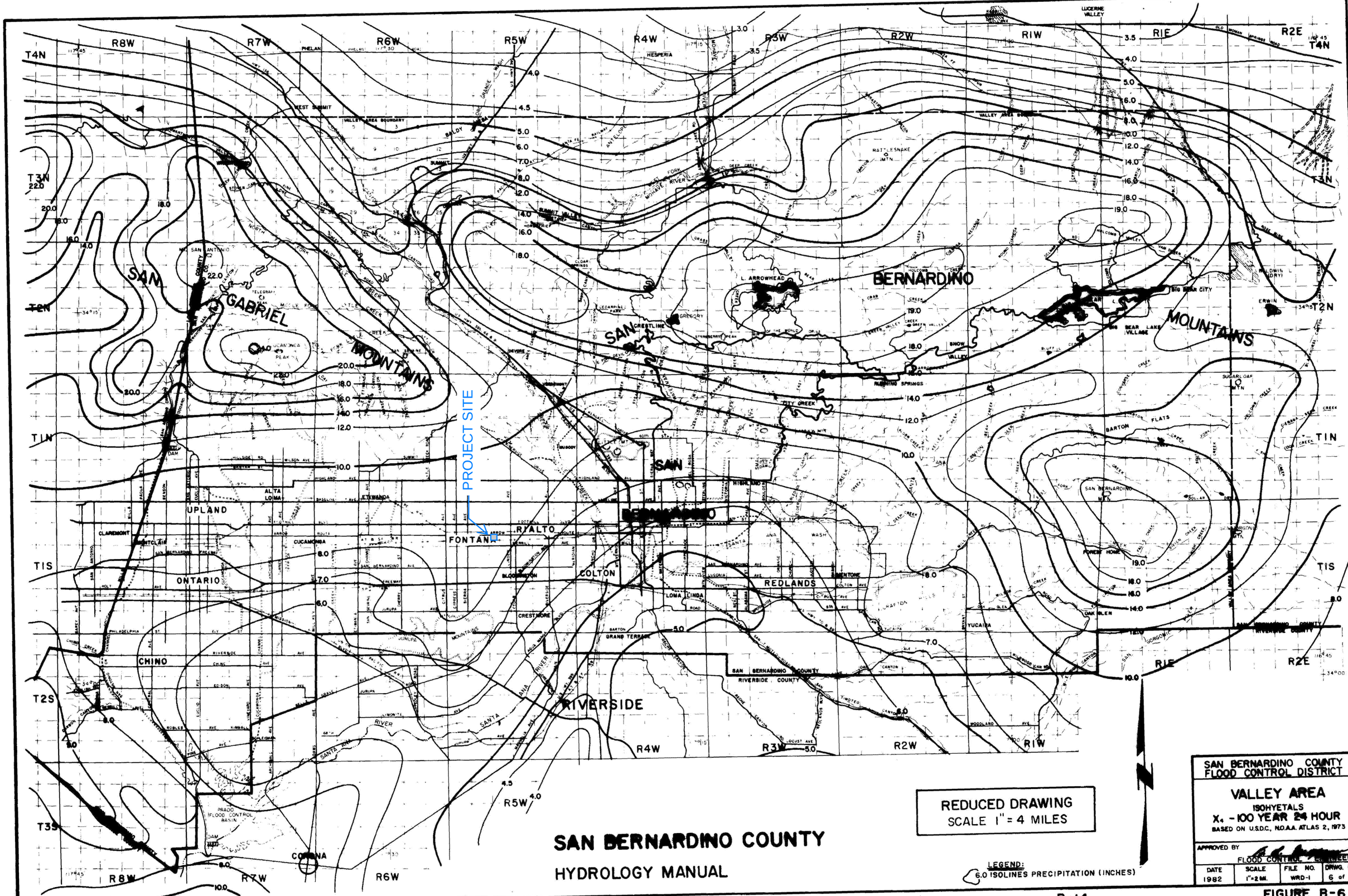
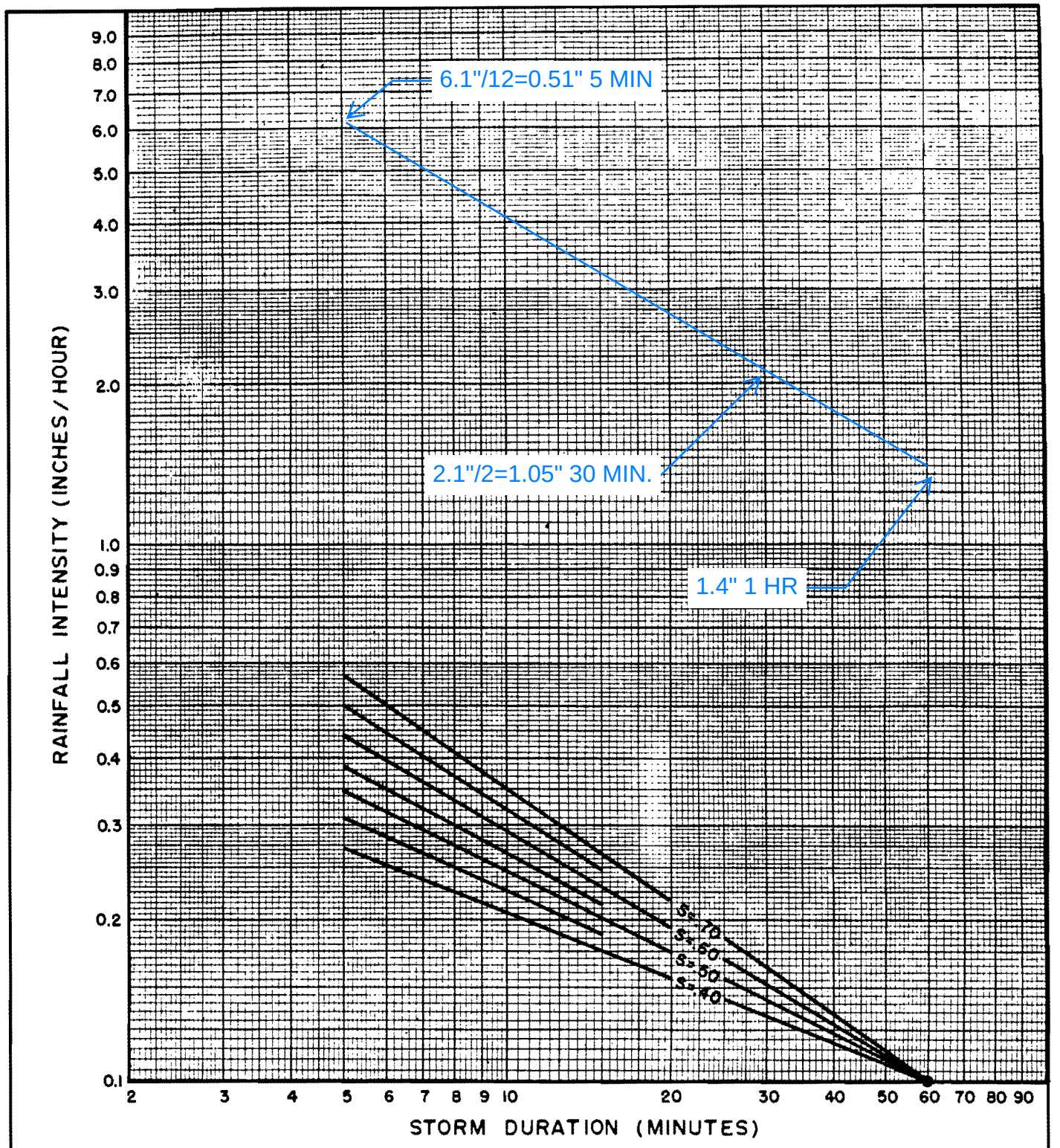

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL
REDUCED DRAWING
SCALE 1" = 4 MILES
LEGEND:
6.0 ISOLINES PRECIPITATION (INCHES)
SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT
VALLEY AREA
ISOHYETALS
X4 - 100 YEAR 24 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, 1973
APPROVED BY
FLOOD CONTROL ENGINEER
DATE 1982
SCALE 1"=2 MI.
FILE NO. WRD-1
DRWG. NO. 6 of 12
SAN GABRIEL MOUNTAINS
SAN BERNARDINO MOUNTAINS
PROJECT SITE
FONTANA
RIVERSIDE
UPLAND
ONTARIO
CHINO
COLTON
REDLANDS
RIALTO
CORONA
PRADO FLOOD CONTROL BASIN
L. ARROWHEAD
BIG BEAR LAKE
BIG BEAR CITY
SAN BERNARDINO
T4N
T3N
T2N
T1N
T1S
T2S
T3S
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E

FIGURE B-6



DESIGN STORM FREQUENCY = 100 YEARS

ONE HOUR POINT RAINFALL = 1.4" INCHES

LOG-LOG SLOPE = 0.60"

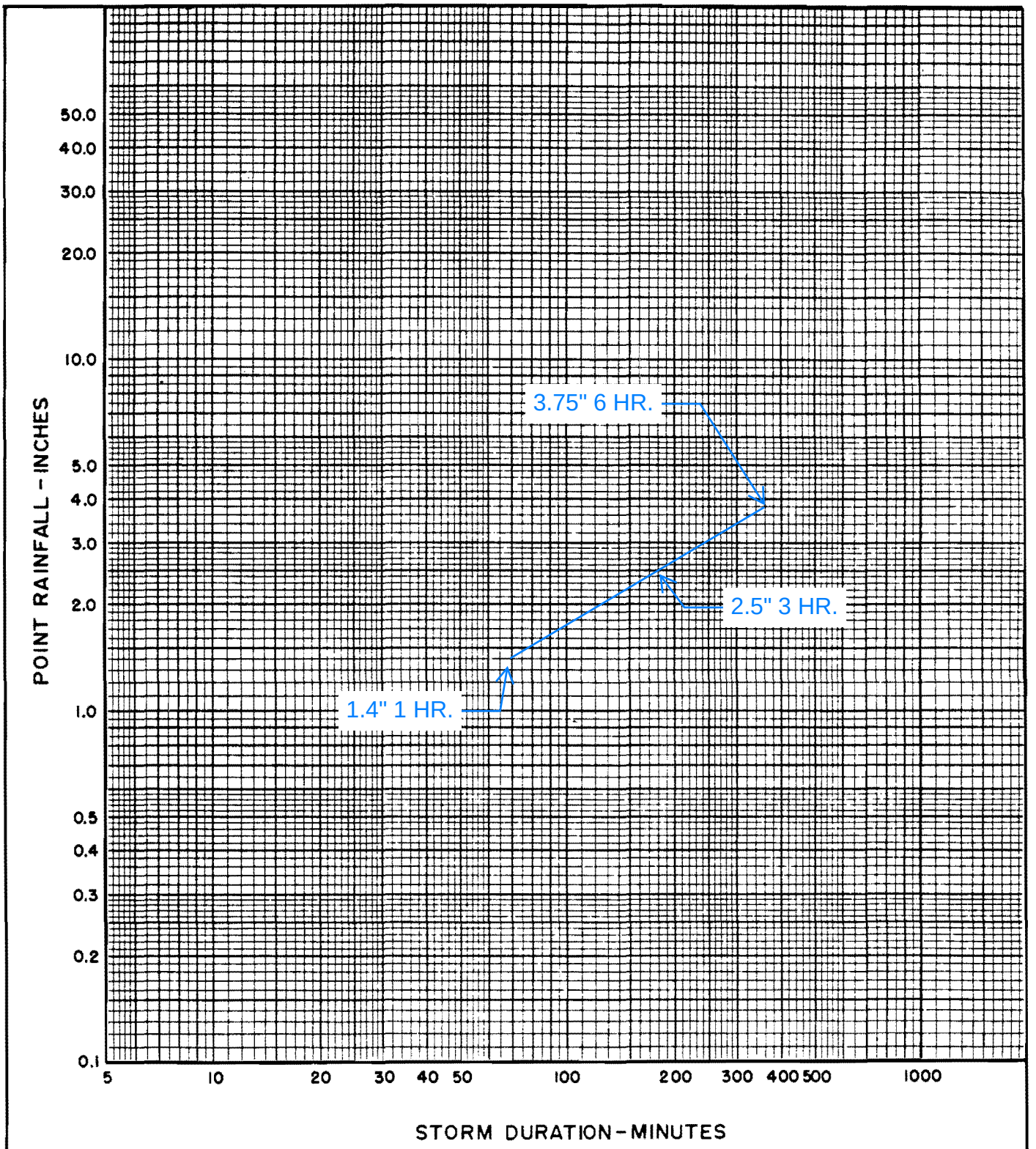
PROJECT LOCATION = ARROW AND JUNEBERRY

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

INTENSITY - DURATION CURVES CALCULATION SHEET

FIGURE D-3



PROJECT LOCATION ARROW AND JUNEBERRY

NOTES TEI JOB NUMBER 4021

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

AREA - AVERAGED MASS RAINFALL PLOTTING SHEET

FIGURE E-8

APPENDIX B

HYDROLOGY CALCULATIONS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* ARROW RT. AND JUNEBERRY DR. - RANCHO CUCAMONGA                        *
* EXISTING CONDITION - NODES 100-102                                    *
* HYDROLOGIC ANALYSIS - 100-YEAR                                        *
 ************************************************************************

  FILE NAME: 4021EX1C.DAT
  TIME/DATE OF STUDY: 16:00 05/03/2023
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.4000

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   977.00
  ELEVATION DATA: UPSTREAM(FEET) =   1148.10  DOWNSTREAM(FEET) =   1138.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.135
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.652
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        3.60      0.74      0.100    52   12.14
  NATURAL POOR COVER
  "BARREN"                   A        2.80      0.18      1.000    93   20.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.24
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.494
```

```
  SUBAREA RUNOFF(CFS) =     20.34
  TOTAL AREA(ACRES) =      6.40   PEAK FLOW RATE(CFS) =     20.34

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1138.90  DOWNSTREAM(FEET) =   1138.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   529.00   CHANNEL SLOPE =  0.0015
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.963
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.20      0.74     0.100    52
  NATURAL POOR COVER
  "BARREN"                   A        5.20      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.967
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.74
  AVERAGE FLOW DEPTH(FEET) =   1.77   TRAVEL TIME(MIN.) =   5.06
  Tc(MIN.) =   17.20
  SUBAREA AREA(ACRES) =     5.40       SUBAREA RUNOFF(CFS) =   13.55
  EFFECTIVE AREA(ACRES) =     11.80     AREA-AVERAGED Fm(INCH/HR) =   0.15
  AREA-AVERAGED Fp(INCH/HR) =   0.21  AREA-AVERAGED Ap =   0.71
  TOTAL AREA(ACRES) =       11.8         PEAK FLOW RATE(CFS) =      29.92

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.83   FLOW VELOCITY(FEET/SEC.) =   1.79
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1506.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       11.8  TC(MIN.) =     17.20
  EFFECTIVE AREA(ACRES) =     11.80  AREA-AVERAGED Fm(INCH/HR)=  0.15
  AREA-AVERAGED Fp(INCH/HR) =  0.21  AREA-AVERAGED Ap = 0.710
  PEAK FLOW RATE(CFS)   =      29.92
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* ARROW RT. AND JUNEBERRY DR. - RANCHO CUCAMONGA                        *
* EXISTING CONDITION - NODES 200-226                                    *
* HYDROLOGIC ANALYSIS - 100-YEAR                                        *
 ************************************************************************

  FILE NAME: 4021EX2C.DAT
  TIME/DATE OF STUDY: 16:00 05/03/2023
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.4000

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   751.00
  ELEVATION DATA: UPSTREAM(FEET) =   1163.50  DOWNSTREAM(FEET) =   1150.21

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.628
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.197
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        1.10      0.74      0.100    52    9.63
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      4.08
  TOTAL AREA(ACRES) =      1.10   PEAK FLOW RATE(CFS) =      4.08
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1150.21  DOWNSTREAM(FEET) =   1138.22
  CHANNEL LENGTH THRU SUBAREA(FEET) =   770.00   CHANNEL SLOPE =  0.0156
  CHANNEL FLOW THRU SUBAREA(CFS) =       4.08
  FLOW VELOCITY(FEET/SEC) =   2.51 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.11   Tc(MIN.) =   14.74
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =    1521.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.250
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        4.20      0.74      0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    4.20      SUBAREA RUNOFF(CFS) =   12.01
  EFFECTIVE AREA(ACRES) =      5.30   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.3       PEAK FLOW RATE(CFS) =      15.15

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1131.70  DOWNSTREAM(FEET) =  1126.90
  FLOW LENGTH(FEET) =  1496.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.86
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.15
  PIPE TRAVEL TIME(MIN.) =   5.13    Tc(MIN.) =   19.87
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =    3017.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.717
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.10      0.74      0.100    52
  NATURAL POOR COVER
  "BARREN"                   A        3.20      0.18      1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.973
  SUBAREA AREA(ACRES) =    3.30      SUBAREA RUNOFF(CFS) =    7.54
  EFFECTIVE AREA(ACRES) =      8.60   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =        8.6       PEAK FLOW RATE(CFS) =      20.15

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1126.90  DOWNSTREAM(FEET) =  1124.56
  FLOW LENGTH(FEET) =   265.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.52
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.15
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =   20.46
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =    3282.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    226.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1124.56  DOWNSTREAM(FEET) =   1123.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =    99.00   CHANNEL SLOPE =  0.0087
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   3.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.622
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "BARREN"                   A        0.20      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.64
  AVERAGE FLOW DEPTH(FEET) =   0.60   TRAVEL TIME(MIN.) =   0.62
  Tc(MIN.) =   21.08
  SUBAREA AREA(ACRES) =     0.20       SUBAREA RUNOFF(CFS) =    0.44
  EFFECTIVE AREA(ACRES) =      8.80     AREA-AVERAGED Fm(INCH/HR) =   0.12
  AREA-AVERAGED Fp(INCH/HR) =   0.26  AREA-AVERAGED Ap =   0.45
  TOTAL AREA(ACRES) =        8.8         PEAK FLOW RATE(CFS) =      20.15
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   2.64
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    226.00 =    3381.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    226.00 TO NODE    226.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==========================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   964.00
  ELEVATION DATA: UPSTREAM(FEET) =   1139.60  DOWNSTREAM(FEET) =   1130.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.987
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.680
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        1.60      0.74     0.100    52   11.99
  NATURAL POOR COVER
  "BARREN"                   A        5.50      0.18     1.000    93   20.70
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.797
  SUBAREA RUNOFF(CFS) =     22.51
  TOTAL AREA(ACRES) =      7.10   PEAK FLOW RATE(CFS) =     22.51

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    211.00 TO NODE    212.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1130.20  DOWNSTREAM(FEET) =  1123.80
 FLOW LENGTH(FEET) =   653.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.25
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      22.51
 PIPE TRAVEL TIME(MIN.) =   1.32    Tc(MIN.) =   13.30
 LONGEST FLOWPATH FROM NODE    210.00 TO NODE    212.00 =    1617.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    212.00 TO NODE    212.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   13.30
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.456
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 A        0.50      0.74     0.100    52
 NATURAL POOR COVER
 "BARREN"                   A       11.60      0.18     1.000    93
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.963
 SUBAREA AREA(ACRES) =   12.10      SUBAREA RUNOFF(CFS) =   35.73
 EFFECTIVE AREA(ACRES) =     19.20   AREA-AVERAGED Fm(INCH/HR) =  0.17
 AREA-AVERAGED Fp(INCH/HR) =  0.19  AREA-AVERAGED Ap =  0.90
 TOTAL AREA(ACRES) =       19.2       PEAK FLOW RATE(CFS) =      56.81

****************************************************************************
 FLOW PROCESS FROM NODE    212.00 TO NODE    224.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.30
 RAINFALL INTENSITY(INCH/HR) =   3.46
 AREA-AVERAGED Fm(INCH/HR) =  0.17
 AREA-AVERAGED Fp(INCH/HR) =  0.19
 AREA-AVERAGED Ap =  0.90
 EFFECTIVE STREAM AREA(ACRES) =      19.20
 TOTAL STREAM AREA(ACRES) =      19.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      56.81

****************************************************************************
 FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   963.00
 ELEVATION DATA: UPSTREAM(FEET) =   1139.20  DOWNSTREAM(FEET) =   1130.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.084
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.662
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 A        0.70      0.74     0.100    52   12.08
 NATURAL POOR COVER
 "BARREN"                   A        4.50      0.18     1.000    93   20.87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.19
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.879
 SUBAREA RUNOFF(CFS) =     16.36
 TOTAL AREA(ACRES) =      5.20   PEAK FLOW RATE(CFS) =     16.36
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    221.00 TO NODE    222.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1130.20  DOWNSTREAM(FEET) =   1124.74
  CHANNEL LENGTH THRU SUBAREA(FEET) =   679.00   CHANNEL SLOPE =  0.0080
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.224
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                A        1.00      0.74     0.100    52
  NATURAL POOR COVER
  "BARREN"                  A        2.40      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.735
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.07
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.96
  AVERAGE FLOW DEPTH(FEET) =   1.51   TRAVEL TIME(MIN.) =   2.86
  Tc(MIN.) =   14.94
  SUBAREA AREA(ACRES) =     3.40       SUBAREA RUNOFF(CFS) =    9.41
  EFFECTIVE AREA(ACRES) =      8.60     AREA-AVERAGED Fm(INCH/HR) =   0.16
  AREA-AVERAGED Fp(INCH/HR) =   0.19  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =        8.6         PEAK FLOW RATE(CFS) =      23.72

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.61   FLOW VELOCITY(FEET/SEC.) =   4.09
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    222.00 =    1642.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    223.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1124.74  DOWNSTREAM(FEET) =  1122.04
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.51
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.72
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   14.95
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    223.00 =    1662.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    224.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.95
  RAINFALL INTENSITY(INCH/HR) =   3.22
  AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.19
  AREA-AVERAGED Ap =  0.82
  EFFECTIVE STREAM AREA(ACRES) =       8.60
  TOTAL STREAM AREA(ACRES) =       8.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      23.72

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       56.81   13.30    3.456  0.19( 0.17) 0.90      19.2     210.00
      2       23.72   14.95    3.222  0.19( 0.16) 0.82       8.6     220.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       79.53   13.30    3.456  0.19( 0.17) 0.88      26.9     210.00
      2       76.49   14.95    3.222  0.19( 0.17) 0.88      27.8     220.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      79.53    Tc(MIN.) =    13.30
  EFFECTIVE AREA(ACRES) =      26.85   AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.19  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =       27.8
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    224.00 =    1662.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    224.00 TO NODE    224.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   13.30
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.456
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "BARREN"                   A        0.50      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    0.50      SUBAREA RUNOFF(CFS) =    1.47
  EFFECTIVE AREA(ACRES) =     27.35   AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.19  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =       28.3       PEAK FLOW RATE(CFS) =      80.99

****************************************************************************
  FLOW PROCESS FROM NODE    224.00 TO NODE    225.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1124.27  DOWNSTREAM(FEET) =  1123.92
  FLOW LENGTH(FEET) =    96.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  37.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.66
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      80.99
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   13.51
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    225.00 =    1758.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    225.00 TO NODE    226.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1123.92  DOWNSTREAM(FEET) =   1123.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   160.00   CHANNEL SLOPE =  0.0014
  CHANNEL BASE(FEET) =    2.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00

         ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
             CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
             ALLOWABLE DEPTH).
             AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
             ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.385
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "BARREN"                   A        0.50      0.18     1.000    93
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.21
  AVERAGE FLOW DEPTH(FEET) =   2.00   TRAVEL TIME(MIN.) =   0.26
  Tc(MIN.) =   13.77
  SUBAREA AREA(ACRES) =     0.50       SUBAREA RUNOFF(CFS) =    1.44
  EFFECTIVE AREA(ACRES) =     27.85     AREA-AVERAGED Fm(INCH/HR) =   0.17
  AREA-AVERAGED Fp(INCH/HR) =   0.19  AREA-AVERAGED Ap =   0.88
  TOTAL AREA(ACRES) =       28.8         PEAK FLOW RATE(CFS) =      80.99
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.


  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.00   FLOW VELOCITY(FEET/SEC.) =  10.12

  ==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    226.00 =    1918.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    226.00 TO NODE    226.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       80.99   13.77    3.385  0.19( 0.17) 0.88      27.9     210.00
      2       77.85   15.44    3.162  0.19( 0.17) 0.88      28.8     220.00
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    226.00 =    1918.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       20.15   21.08    2.622  0.26( 0.12) 0.45       8.8     200.00
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    226.00 =    3381.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       98.17   13.77    3.385  0.19( 0.16) 0.81      33.6     210.00
      2       95.77   15.44    3.162  0.20( 0.16) 0.80      35.2     220.00
      3       83.98   21.08    2.622  0.20( 0.15) 0.78      37.6     200.00
    TOTAL AREA(ACRES) =        37.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       98.17  Tc(MIN.) =   13.775
  EFFECTIVE AREA(ACRES) =     33.60  AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.19  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =       37.6
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    226.00 =    3381.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    226.00 TO NODE    226.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       37.6  TC(MIN.) =     13.77
  EFFECTIVE AREA(ACRES) =     33.60  AREA-AVERAGED Fm(INCH/HR)=  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.19  AREA-AVERAGED Ap = 0.809
  PEAK FLOW RATE(CFS)   =      98.17
```

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	98.17	13.77	3.385	0.19(0.16)	0.81	33.6	210.00
2	95.77	15.44	3.162	0.20(0.16)	0.80	35.2	220.00
3	83.98	21.08	2.622	0.20(0.15)	0.78	37.6	200.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* ARROW RT. AND JUNEBERRY DR. - RANCHO CUCAMONGA                        *
* EXISTING CONDITION - NODES 300-314                                    *
* HYDROLOGIC ANALYSIS - 100-YEAR                                        *
 ************************************************************************

  FILE NAME: 4021EX3C.DAT
  TIME/DATE OF STUDY: 16:00 05/03/2023
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.4000

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   855.00
  ELEVATION DATA: UPSTREAM(FEET) =   1162.70  DOWNSTREAM(FEET) =   1152.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.952
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.884
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        1.20      0.74      0.100    52   10.95
  NATURAL POOR COVER
  "BARREN"                   A        5.50      0.18      1.000    93   18.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.19
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.839
```

```
  SUBAREA RUNOFF(CFS) =     22.45
  TOTAL AREA(ACRES) =      6.70   PEAK FLOW RATE(CFS) =     22.45

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1152.40  DOWNSTREAM(FEET) =   1149.78
  CHANNEL LENGTH THRU SUBAREA(FEET) =   619.00   CHANNEL SLOPE =  0.0042
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.360
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.70      0.74     0.100    52
  NATURAL POOR COVER
  "BARREN"                   A        6.10      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.804
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.45
  AVERAGE FLOW DEPTH(FEET) =   1.71   TRAVEL TIME(MIN.) =   2.99
  Tc(MIN.) =   13.94
  SUBAREA AREA(ACRES) =     7.80       SUBAREA RUNOFF(CFS) =   22.49
  EFFECTIVE AREA(ACRES) =     14.50     AREA-AVERAGED Fm(INCH/HR) =   0.16
  AREA-AVERAGED Fp(INCH/HR) =   0.19  AREA-AVERAGED Ap =   0.82
  TOTAL AREA(ACRES) =       14.5         PEAK FLOW RATE(CFS) =      41.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.93   FLOW VELOCITY(FEET/SEC.) =   3.66
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    302.00 =    1474.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1149.78  DOWNSTREAM(FEET) =  1127.54
  FLOW LENGTH(FEET) =  1840.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.19
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.78
  PIPE TRAVEL TIME(MIN.) =   3.01    Tc(MIN.) =   16.95
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    303.00 =    3314.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    314.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1127.54  DOWNSTREAM(FEET) =   1125.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =    65.00   CHANNEL SLOPE =  0.0268
  CHANNEL FLOW THRU SUBAREA(CFS) =      41.78
  FLOW VELOCITY(FEET/SEC) =   6.01 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   0.18   Tc(MIN.) =   17.13
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    314.00 =    3379.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    314.00 TO NODE    314.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.970
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "BARREN"                  A       13.50      0.18      1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =   13.50      SUBAREA RUNOFF(CFS) =   33.89
  EFFECTIVE AREA(ACRES) =     28.00   AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.19  AREA-AVERAGED Ap =  0.91
  TOTAL AREA(ACRES) =       28.0       PEAK FLOW RATE(CFS) =      70.58

****************************************************************************
  FLOW PROCESS FROM NODE    314.00 TO NODE    314.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.13
  RAINFALL INTENSITY(INCH/HR) =   2.97
  AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.19
  AREA-AVERAGED Ap =  0.91
  EFFECTIVE STREAM AREA(ACRES) =      28.00
  TOTAL STREAM AREA(ACRES) =      28.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      70.58

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    311.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   795.00
  ELEVATION DATA: UPSTREAM(FEET) =   1150.50  DOWNSTREAM(FEET) =   1136.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.917
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.123
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  A        0.10      0.74     0.100    52    9.92
  NATURAL POOR COVER
  "BARREN"                    A        4.30      0.18     1.000    93   17.13
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.980
  SUBAREA RUNOFF(CFS) =     15.62
  TOTAL AREA(ACRES) =      4.40   PEAK FLOW RATE(CFS) =     15.62

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    312.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1136.90  DOWNSTREAM(FEET) =   1132.79
  CHANNEL LENGTH THRU SUBAREA(FEET) =   707.00   CHANNEL SLOPE =  0.0058
  CHANNEL FLOW THRU SUBAREA(CFS) =      15.62
  FLOW VELOCITY(FEET/SEC) =   2.14 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   5.51   Tc(MIN.) =   15.43
  LONGEST FLOWPATH FROM NODE    310.00 TO NODE    312.00 =    1502.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    312.00 TO NODE    312.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.43
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.163
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  COMMERCIAL                  A        0.10      0.74     0.100    52
  NATURAL POOR COVER
  "BARREN"                    A       12.40      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.993
  SUBAREA AREA(ACRES) =   12.50      SUBAREA RUNOFF(CFS) =   33.57
  EFFECTIVE AREA(ACRES) =     16.90   AREA-AVERAGED Fm(INCH/HR) =  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap =  0.99
  TOTAL AREA(ACRES) =       16.9       PEAK FLOW RATE(CFS) =      45.39

****************************************************************************
  FLOW PROCESS FROM NODE    312.00 TO NODE    313.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1132.79  DOWNSTREAM(FEET) =   1122.30
  CHANNEL LENGTH THRU SUBAREA(FEET) =   389.00   CHANNEL SLOPE =  0.0270
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.067
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  A        2.20      0.74     0.100    52
  NATURAL POOR COVER
  "BARREN"                    A       11.00      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.19
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.850
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.96
  AVERAGE FLOW DEPTH(FEET) =   1.44   TRAVEL TIME(MIN.) =   0.81
  Tc(MIN.) =   16.24
  SUBAREA AREA(ACRES) =    13.20       SUBAREA RUNOFF(CFS) =   34.50
  EFFECTIVE AREA(ACRES) =     30.10     AREA-AVERAGED Fm(INCH/HR) =   0.17
  AREA-AVERAGED Fp(INCH/HR) =   0.18  AREA-AVERAGED Ap =   0.93
  TOTAL AREA(ACRES) =       30.1         PEAK FLOW RATE(CFS) =      78.43

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.64   FLOW VELOCITY(FEET/SEC.) =   8.51
  LONGEST FLOWPATH FROM NODE    310.00 TO NODE    313.00 =    1891.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    313.00 TO NODE    314.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1128.16  DOWNSTREAM(FEET) =   1125.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =   435.00   CHANNEL SLOPE =  0.0054
  CHANNEL FLOW THRU SUBAREA(CFS) =      78.43
  FLOW VELOCITY(FEET/SEC) =   3.25 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =   18.47
  LONGEST FLOWPATH FROM NODE    310.00 TO NODE    314.00 =    2326.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    314.00 TO NODE    314.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.839
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL POOR COVER
  "BARREN"                    A        3.00      0.18     1.000    93
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.18
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    3.00      SUBAREA RUNOFF(CFS) =    7.18
  EFFECTIVE AREA(ACRES) =     33.10   AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.18  AREA-AVERAGED Ap =  0.93
```

```
  TOTAL AREA(ACRES) =       33.1       PEAK FLOW RATE(CFS) =      79.43

****************************************************************************
  FLOW PROCESS FROM NODE    314.00 TO NODE    314.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.47
  RAINFALL INTENSITY(INCH/HR) =   2.84
  AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.18
  AREA-AVERAGED Ap =  0.93
  EFFECTIVE STREAM AREA(ACRES) =      33.10
  TOTAL STREAM AREA(ACRES) =      33.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      79.43

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       70.58   17.13    2.970  0.19( 0.17) 0.91      28.0     300.00
      2       79.43   18.47    2.839  0.18( 0.17) 0.93      33.1     310.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      147.88   17.13    2.970  0.19( 0.17) 0.92      58.7     300.00
      2      146.71   18.47    2.839  0.19( 0.17) 0.92      61.1     310.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     147.88    Tc(MIN.) =    17.13
  EFFECTIVE AREA(ACRES) =      58.70   AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.19  AREA-AVERAGED Ap =  0.92
  TOTAL AREA(ACRES) =       61.1
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    314.00 =    3379.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       61.1  TC(MIN.) =     17.13
  EFFECTIVE AREA(ACRES) =     58.70  AREA-AVERAGED Fm(INCH/HR)=  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.19  AREA-AVERAGED Ap = 0.921
  PEAK FLOW RATE(CFS)   =     147.88

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      147.88   17.13    2.970  0.19( 0.17) 0.92      58.7     300.00
      2      146.71   18.47    2.839  0.19( 0.17) 0.92      61.1     310.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB NO. 4021                                                      *
* PROPOSED CONDITION 100-YR STORM EVENT                                 *
* NODES 100-171                                                         *
 ************************************************************************

  FILE NAME: W:\4021\4021PR1C.DAT
  TIME/DATE OF STUDY: 09:17 11/07/2023
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.4000

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   383.00
  ELEVATION DATA: UPSTREAM(FEET) =   1155.31  DOWNSTREAM(FEET) =   1152.57

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.815
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.425
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.40      0.74     0.100    52    8.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.57
  TOTAL AREA(ACRES) =      0.40   PEAK FLOW RATE(CFS) =      1.57

************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1149.24  DOWNSTREAM(FEET) =  1149.02
  FLOW LENGTH(FEET) =    44.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.52
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.57
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    9.02
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     427.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.02
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.363
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.20      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.20      SUBAREA RUNOFF(CFS) =    4.63
  EFFECTIVE AREA(ACRES) =      1.60   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.6       PEAK FLOW RATE(CFS) =       6.18

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    123.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1149.02  DOWNSTREAM(FEET) =  1148.00
  FLOW LENGTH(FEET) =   208.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.88
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.18
  PIPE TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =    9.73
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    123.00 =     635.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   173.00
  ELEVATION DATA: UPSTREAM(FEET) =   1159.60  DOWNSTREAM(FEET) =   1158.75

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.915
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.118
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.20      0.74     0.100    52    6.92
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.20   PEAK FLOW RATE(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    112.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1154.75  DOWNSTREAM(FEET) =  1153.45
  FLOW LENGTH(FEET) =   265.00   MANNING'S N =  0.012
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.9 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.04
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.91
  PIPE TRAVEL TIME(MIN.) =   1.45    Tc(MIN.) =    8.37
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    112.00 =     438.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.565
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.10      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.10      SUBAREA RUNOFF(CFS) =    8.49
  EFFECTIVE AREA(ACRES) =      2.30   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.3       PEAK FLOW RATE(CFS) =       9.30

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1153.43  DOWNSTREAM(FEET) =  1151.19
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.87
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.30
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    8.73
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    113.00 =     608.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.73
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.451
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.30      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.30      SUBAREA RUNOFF(CFS) =    5.12
  EFFECTIVE AREA(ACRES) =      3.60   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        3.6       PEAK FLOW RATE(CFS) =      14.18

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    122.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1151.14  DOWNSTREAM(FEET) =  1149.78
  FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.32
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.18
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    8.77
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    122.00 =     642.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    122.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    8.77
  RAINFALL INTENSITY(INCH/HR) =   4.44
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       3.60
  TOTAL STREAM AREA(ACRES) =       3.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      14.18

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   291.00
  ELEVATION DATA: UPSTREAM(FEET) =   1161.97  DOWNSTREAM(FEET) =   1158.08

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.970
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.094
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp          Ap     SCS   Tc
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  A        2.30      0.74     0.100    52    6.97
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     10.39
  TOTAL AREA(ACRES) =      2.30   PEAK FLOW RATE(CFS) =     10.39

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1154.08  DOWNSTREAM(FEET) =  1149.78
  FLOW LENGTH(FEET) =   241.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.08
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.39
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    7.41
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    122.00 =     532.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    122.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.41
  RAINFALL INTENSITY(INCH/HR) =   4.91
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       2.30
  TOTAL STREAM AREA(ACRES) =       2.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.39

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       14.18    8.77    4.438  0.74( 0.07) 0.10       3.6     110.00
      2       10.39    7.41    4.910  0.74( 0.07) 0.10       2.3     120.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       23.67    7.41    4.910  0.74( 0.07) 0.10       5.3     120.00
      2       23.56    8.77    4.438  0.74( 0.07) 0.10       5.9     110.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.67    Tc(MIN.) =     7.41
```

```
  EFFECTIVE AREA(ACRES) =       5.34   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.9
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    122.00 =     642.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1149.57  DOWNSTREAM(FEET) =  1147.99
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.83
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.67
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    7.45
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    123.00 =     677.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       23.67    7.45    4.895  0.74( 0.07) 0.10       5.3     120.00
      2       23.56    8.81    4.427  0.74( 0.07) 0.10       5.9     110.00
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    123.00 =     677.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.18    9.73    4.169  0.74( 0.07) 0.10       1.6     100.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    123.00 =     635.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       29.24    7.45    4.895  0.74( 0.07) 0.10       6.6     120.00
      2       29.50    8.81    4.427  0.74( 0.07) 0.10       7.3     110.00
      3       28.34    9.73    4.169  0.74( 0.07) 0.10       7.5     100.00
    TOTAL AREA(ACRES) =         7.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       29.50  Tc(MIN.) =    8.808
  EFFECTIVE AREA(ACRES) =      7.35  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    123.00 =     677.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    123.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    124.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1147.98  DOWNSTREAM(FEET) =  1146.13
  FLOW LENGTH(FEET) =   374.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.07
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.50
  PIPE TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =    9.69
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    124.00 =    1051.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    124.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==============================================================================
  MAINLINE Tc(MIN.) =    9.69
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.181
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.80      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.80      SUBAREA RUNOFF(CFS) =    6.65
  EFFECTIVE AREA(ACRES) =      9.15   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        9.3       PEAK FLOW RATE(CFS) =      33.81

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       33.91    8.33    4.577  0.74( 0.07) 0.10       8.4     120.00
      2       33.81    9.69    4.181  0.74( 0.07) 0.10       9.1     110.00
      3       32.50   10.62    3.957  0.74( 0.07) 0.10       9.3     100.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      33.91  Tc(MIN.) =    8.33
  AREA-AVERAGED Fm(INCH/HR) =  0.07  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10  EFFECTIVE AREA(ACRES) =       8.37

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    135.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1146.11  DOWNSTREAM(FEET) =  1144.40
  FLOW LENGTH(FEET) =   340.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.50
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.91
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =    9.09
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    135.00 =    1391.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    135.00 TO NODE    135.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.09
  RAINFALL INTENSITY(INCH/HR) =   4.34
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       8.37
  TOTAL STREAM AREA(ACRES) =       9.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      33.91

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   249.00
  ELEVATION DATA: UPSTREAM(FEET) =   1159.07  DOWNSTREAM(FEET) =   1157.85

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.004
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.688
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.20      0.74     0.100    52    8.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.20   PEAK FLOW RATE(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1153.85  DOWNSTREAM(FEET) =  1152.63
  FLOW LENGTH(FEET) =   249.00   MANNING'S N =  0.012
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.97
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.83
  PIPE TRAVEL TIME(MIN.) =   1.40    Tc(MIN.) =    9.40
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    132.00 =     498.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    132.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.257
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.70      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.70      SUBAREA RUNOFF(CFS) =   10.17
  EFFECTIVE AREA(ACRES) =      2.90   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.9       PEAK FLOW RATE(CFS) =      10.92

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1152.61  DOWNSTREAM(FEET) =  1148.15
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  12.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.27
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.92
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    9.68
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    133.00 =     668.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    133.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.68
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.184
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.20      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    0.74
  EFFECTIVE AREA(ACRES) =      3.10   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        3.1       PEAK FLOW RATE(CFS) =      11.47

****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    134.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1148.05  DOWNSTREAM(FEET) =  1147.82
  FLOW LENGTH(FEET) =    11.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.87
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.47
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    9.69
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    134.00 =     679.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    134.00 TO NODE    134.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    9.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.179
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 A        0.40      0.74     0.100    52
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.40      SUBAREA RUNOFF(CFS) =    1.48
 EFFECTIVE AREA(ACRES) =      3.50   AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        3.5       PEAK FLOW RATE(CFS) =      12.93

****************************************************************************
 FLOW PROCESS FROM NODE    134.00 TO NODE    135.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1147.82  DOWNSTREAM(FEET) =  1144.52
 FLOW LENGTH(FEET) =    56.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.93
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.93
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    9.76
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    135.00 =     735.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    135.00 TO NODE    135.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.76
 RAINFALL INTENSITY(INCH/HR) =   4.16
 AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.74
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       3.50
 TOTAL STREAM AREA(ACRES) =       3.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.93

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       33.91    9.09    4.345  0.74( 0.07) 0.10       8.4     120.00
     1       33.81   10.45    3.996  0.74( 0.07) 0.10       9.1     110.00
     1       32.50   11.38    3.796  0.74( 0.07) 0.10       9.3     100.00
     2       12.93    9.76    4.163  0.74( 0.07) 0.10       3.5     130.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       46.49    9.09    4.345  0.74( 0.07) 0.10      11.6     120.00
     2       46.79    9.76    4.163  0.74( 0.07) 0.10      12.3     130.00
     3       46.21   10.45    3.996  0.74( 0.07) 0.10      12.6     110.00
     4       44.27   11.38    3.796  0.74( 0.07) 0.10      12.8     100.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      46.79    Tc(MIN.) =     9.76
 EFFECTIVE AREA(ACRES) =      12.25   AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       12.8
 LONGEST FLOWPATH FROM NODE    110.00 TO NODE    135.00 =    1391.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    135.00 TO NODE    136.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1144.38  DOWNSTREAM(FEET) =  1143.32
  FLOW LENGTH(FEET) =   106.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.53
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      46.79
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    9.92
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    136.00 =    1497.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    136.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.92
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.121
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.90      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.90      SUBAREA RUNOFF(CFS) =    3.28
  EFFECTIVE AREA(ACRES) =     13.15   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       13.7       PEAK FLOW RATE(CFS) =      47.90

****************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    136.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.92
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.121
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.50      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.50      SUBAREA RUNOFF(CFS) =    1.82
  EFFECTIVE AREA(ACRES) =     13.65   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       14.2       PEAK FLOW RATE(CFS) =      49.72

****************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    137.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1143.27  DOWNSTREAM(FEET) =  1127.99
  FLOW LENGTH(FEET) =  1603.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.41
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.72
  PIPE TRAVEL TIME(MIN.) =   2.57    Tc(MIN.) =   12.49
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    137.00 =    3100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    137.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.590
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        3.40      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.40      SUBAREA RUNOFF(CFS) =   10.76
  EFFECTIVE AREA(ACRES) =     17.05   AREA-AVERAGED Fm(INCH/HR) =  0.07
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       17.6       PEAK FLOW RATE(CFS) =      53.95

****************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    137.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.590
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.10      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.10      SUBAREA RUNOFF(CFS) =    3.48
  EFFECTIVE AREA(ACRES) =     18.15   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       18.7       PEAK FLOW RATE(CFS) =      57.43

****************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    138.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1127.98  DOWNSTREAM(FEET) =  1127.40
  FLOW LENGTH(FEET) =   183.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  33.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.08
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      57.43
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =   12.92
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    138.00 =    3283.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    138.00 TO NODE    171.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   285.00
  ELEVATION DATA: UPSTREAM(FEET) =   1148.38  DOWNSTREAM(FEET) =   1139.65

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.856
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.656
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        1.00      0.74     0.100    52    5.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.02
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      5.02

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    141.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.86
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.656
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.70      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.70      SUBAREA RUNOFF(CFS) =    3.52
  EFFECTIVE AREA(ACRES) =      1.70   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
```

```
  TOTAL AREA(ACRES) =        1.7       PEAK FLOW RATE(CFS) =       8.54

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    142.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1135.65  DOWNSTREAM(FEET) =  1134.42
  FLOW LENGTH(FEET) =   387.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.44
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.54
  PIPE TRAVEL TIME(MIN.) =   1.45    Tc(MIN.) =    7.31
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    142.00 =     672.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    142.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.952
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.60      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.60      SUBAREA RUNOFF(CFS) =    2.63
  EFFECTIVE AREA(ACRES) =      2.30   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.3       PEAK FLOW RATE(CFS) =      10.10

****************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    142.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.952
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.50      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.50      SUBAREA RUNOFF(CFS) =    2.19
  EFFECTIVE AREA(ACRES) =      2.80   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.8       PEAK FLOW RATE(CFS) =      12.29

****************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    145.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1134.42  DOWNSTREAM(FEET) =  1132.95
  FLOW LENGTH(FEET) =   458.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.88
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.29
  PIPE TRAVEL TIME(MIN.) =   1.56    Tc(MIN.) =    8.87
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    145.00 =    1130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    145.00 TO NODE    145.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.87
  RAINFALL INTENSITY(INCH/HR) =   4.41
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
```

```
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       2.80
  TOTAL STREAM AREA(ACRES) =       2.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.29

****************************************************************************
  FLOW PROCESS FROM NODE    143.00 TO NODE    144.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   364.00
  ELEVATION DATA: UPSTREAM(FEET) =   1152.15  DOWNSTREAM(FEET) =   1137.98

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.155
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.489
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  A        5.00      0.74     0.100    52    6.16
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     24.36
  TOTAL AREA(ACRES) =      5.00   PEAK FLOW RATE(CFS) =     24.36

****************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    145.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1133.98  DOWNSTREAM(FEET) =  1132.95
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.65
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      24.36
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    6.21
  LONGEST FLOWPATH FROM NODE    143.00 TO NODE    145.00 =     404.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    145.00 TO NODE    145.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.21
  RAINFALL INTENSITY(INCH/HR) =   5.46
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       5.00
  TOTAL STREAM AREA(ACRES) =       5.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      24.36

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       12.29    8.87    4.408  0.74( 0.07) 0.10       2.8     140.00
      2       24.36    6.21    5.461  0.74( 0.07) 0.10       5.0     143.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       35.06    6.21    5.461  0.74( 0.07) 0.10       7.0     143.00
      2       31.90    8.87    4.408  0.74( 0.07) 0.10       7.8     140.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      35.06    Tc(MIN.) =     6.21
  EFFECTIVE AREA(ACRES) =       6.96   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.8
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    145.00 =    1130.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    145.00 TO NODE    146.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1132.95  DOWNSTREAM(FEET) =  1132.56
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.36
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      35.06
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    6.53
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    146.00 =    1252.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    146.00 TO NODE    146.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.53
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.299
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.90      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    8.93
  EFFECTIVE AREA(ACRES) =      8.86   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        9.7       PEAK FLOW RATE(CFS) =      41.66

****************************************************************************
  FLOW PROCESS FROM NODE    146.00 TO NODE    147.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1132.56  DOWNSTREAM(FEET) =  1132.17
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.67
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.66
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    6.83
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    147.00 =    1374.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    147.00 TO NODE    147.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.83
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.155
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.90      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    8.69
  EFFECTIVE AREA(ACRES) =     10.76   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       11.6       PEAK FLOW RATE(CFS) =      49.20

****************************************************************************
  FLOW PROCESS FROM NODE    147.00 TO NODE    148.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1132.17  DOWNSTREAM(FEET) =  1131.78
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  31.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.78
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.20
```

```
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    7.13
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    148.00 =    1496.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    148.00 TO NODE    148.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.024
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.90      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    8.46
  EFFECTIVE AREA(ACRES) =     12.66   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       13.5       PEAK FLOW RATE(CFS) =      56.40

****************************************************************************
  FLOW PROCESS FROM NODE    148.00 TO NODE    149.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1131.78  DOWNSTREAM(FEET) =  1131.39
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.10
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      56.40
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    7.42
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    149.00 =    1618.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    149.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.907
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.90      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    8.26
  EFFECTIVE AREA(ACRES) =     14.56   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       15.4       PEAK FLOW RATE(CFS) =      63.33

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    150.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1131.19  DOWNSTREAM(FEET) =  1131.00
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  37.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.61
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      63.33
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    7.78
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    150.00 =    1740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.769
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  COMMERCIAL                  A        2.50      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.50      SUBAREA RUNOFF(CFS) =   10.56
  EFFECTIVE AREA(ACRES) =     17.06   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       17.9       PEAK FLOW RATE(CFS) =      72.08

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1131.00  DOWNSTREAM(FEET) =  1130.61
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  36.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.46
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      72.08
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    8.05
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    151.00 =    1862.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    151.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.05
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.671
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  A        1.90      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    7.86
  EFFECTIVE AREA(ACRES) =     18.96   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       19.8       PEAK FLOW RATE(CFS) =      78.44

****************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    152.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1130.61  DOWNSTREAM(FEET) =  1130.22
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  36.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.74
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      78.44
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    8.32
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    152.00 =    1984.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.582
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  A        1.90      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    7.71
  EFFECTIVE AREA(ACRES) =     20.86   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       21.7       PEAK FLOW RATE(CFS) =      84.63

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    153.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1130.22  DOWNSTREAM(FEET) =  1129.83
  FLOW LENGTH(FEET) =   122.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  38.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.78
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      84.63
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    8.58
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    153.00 =    2106.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    153.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =    8.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.498
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        3.80      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.80      SUBAREA RUNOFF(CFS) =   15.13
  EFFECTIVE AREA(ACRES) =     24.66   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       25.5       PEAK FLOW RATE(CFS) =      98.17

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1129.83  DOWNSTREAM(FEET) =  1128.52
  FLOW LENGTH(FEET) =   192.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.85
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      98.17
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    8.87
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    154.00 =    2298.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =    8.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.407
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.20      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.20      SUBAREA RUNOFF(CFS) =    0.78
  EFFECTIVE AREA(ACRES) =     24.86   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       25.7       PEAK FLOW RATE(CFS) =      98.17
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    170.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1128.52  DOWNSTREAM(FEET) =  1128.06
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.67
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      98.17
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    8.98
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    170.00 =    2368.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    170.00 IS CODE =   1
```

```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.98
  RAINFALL INTENSITY(INCH/HR) =   4.38
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      24.86
  TOTAL STREAM AREA(ACRES) =      25.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      98.17

****************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    161.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   404.00
  ELEVATION DATA: UPSTREAM(FEET) =   1153.24  DOWNSTREAM(FEET) =   1136.19

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.315
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.405
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        4.30      0.74     0.100    52    6.31
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     20.63
  TOTAL AREA(ACRES) =      4.30   PEAK FLOW RATE(CFS) =     20.63

****************************************************************************
  FLOW PROCESS FROM NODE    161.00 TO NODE    162.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1133.54  DOWNSTREAM(FEET) =  1133.07
  FLOW LENGTH(FEET) =   192.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.97
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.63
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =    6.96
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    162.00 =     596.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    162.00 TO NODE    162.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.96
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.099
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.10      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =     2.10      SUBAREA RUNOFF(CFS) =     9.50
  EFFECTIVE AREA(ACRES) =      6.40   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.4       PEAK FLOW RATE(CFS) =      28.95

****************************************************************************
  FLOW PROCESS FROM NODE    162.00 TO NODE    163.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1133.07  DOWNSTREAM(FEET) =  1132.60
  FLOW LENGTH(FEET) =   188.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.56
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      28.95
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =    7.52
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    163.00 =     784.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    163.00 TO NODE    163.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.867
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.00      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.00      SUBAREA RUNOFF(CFS) =    8.63
  EFFECTIVE AREA(ACRES) =      8.40   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        8.4       PEAK FLOW RATE(CFS) =      36.23

****************************************************************************
  FLOW PROCESS FROM NODE    163.00 TO NODE    164.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1132.60  DOWNSTREAM(FEET) =  1132.13
  FLOW LENGTH(FEET) =   188.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.88
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      36.23
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    8.05
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    164.00 =     972.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    164.00 TO NODE    164.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.05
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.671
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.00      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.00      SUBAREA RUNOFF(CFS) =    8.27
  EFFECTIVE AREA(ACRES) =     10.40   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       10.4       PEAK FLOW RATE(CFS) =      43.03

****************************************************************************
  FLOW PROCESS FROM NODE    164.00 TO NODE    165.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1132.13  DOWNSTREAM(FEET) =  1131.66
  FLOW LENGTH(FEET) =   188.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  31.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.99
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.03
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =    8.58
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    165.00 =    1160.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    165.00 TO NODE    165.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.498
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL               A        2.30      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    9.16
  EFFECTIVE AREA(ACRES) =     12.70   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       12.7       PEAK FLOW RATE(CFS) =      50.56

****************************************************************************
  FLOW PROCESS FROM NODE    165.00 TO NODE    166.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1131.66  DOWNSTREAM(FEET) =  1131.19
  FLOW LENGTH(FEET) =   188.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.29
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      50.56
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =    9.08
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    166.00 =    1348.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    166.00 TO NODE    166.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.08
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.348
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL               A        3.00      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.00      SUBAREA RUNOFF(CFS) =   11.54
  EFFECTIVE AREA(ACRES) =     15.70   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       15.7       PEAK FLOW RATE(CFS) =      60.39

****************************************************************************
  FLOW PROCESS FROM NODE    166.00 TO NODE    167.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1131.19  DOWNSTREAM(FEET) =  1130.30
  FLOW LENGTH(FEET) =   355.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.59
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.39
  PIPE TRAVEL TIME(MIN.) =   0.90    Tc(MIN.) =    9.97
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    167.00 =    1703.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    167.00 TO NODE    167.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.97
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.109
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL               A        0.40      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.40      SUBAREA RUNOFF(CFS) =    1.45
  EFFECTIVE AREA(ACRES) =     16.10   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       16.1       PEAK FLOW RATE(CFS) =      60.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    167.00 TO NODE    168.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1130.30  DOWNSTREAM(FEET) =  1130.15
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.58
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.39
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   10.13
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    168.00 =    1763.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    168.00 TO NODE    168.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   10.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.072
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.60      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.60      SUBAREA RUNOFF(CFS) =    2.16
  EFFECTIVE AREA(ACRES) =     16.70   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       16.7       PEAK FLOW RATE(CFS) =      60.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    168.00 TO NODE    169.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1130.15  DOWNSTREAM(FEET) =  1128.71
  FLOW LENGTH(FEET) =   574.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  34.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.59
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.39
  PIPE TRAVEL TIME(MIN.) =   1.45    Tc(MIN.) =   11.58
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    169.00 =    2337.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    169.00 TO NODE    169.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   11.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.757
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.60      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.60      SUBAREA RUNOFF(CFS) =    1.99
  EFFECTIVE AREA(ACRES) =     17.30   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       17.3       PEAK FLOW RATE(CFS) =      60.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    169.00 TO NODE    170.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1128.71  DOWNSTREAM(FEET) =  1128.06
  FLOW LENGTH(FEET) =   262.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  35.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.56
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.39
  PIPE TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =   12.24
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    170.00 =    2599.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    170.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.24
  RAINFALL INTENSITY(INCH/HR) =   3.63
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      17.30
  TOTAL STREAM AREA(ACRES) =      17.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      60.39

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       98.17    8.98    4.375  0.74( 0.07) 0.10      24.9     143.00
      1       85.80   11.72    3.730  0.74( 0.07) 0.10      25.7     140.00
      2       60.39   12.24    3.633  0.74( 0.07) 0.10      17.3     160.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      151.72    8.98    4.375  0.74( 0.07) 0.10      37.6     143.00
      2      145.17   11.72    3.730  0.74( 0.07) 0.10      42.3     140.00
      3      143.92   12.24    3.633  0.74( 0.07) 0.10      43.0     160.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     151.72    Tc(MIN.) =     8.98
  EFFECTIVE AREA(ACRES) =      37.55   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       43.0
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    170.00 =    2599.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    171.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1128.06  DOWNSTREAM(FEET) =  1127.49
  FLOW LENGTH(FEET) =   229.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  50.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.23
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     151.72
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =    9.45
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    171.00 =    2828.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    171.00 TO NODE    171.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      151.72    9.45    4.245  0.74( 0.07) 0.10      37.6     143.00
      2      145.17   12.18    3.644  0.74( 0.07) 0.10      42.3     140.00
      3      143.92   12.71    3.553  0.74( 0.07) 0.10      43.0     160.00
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    171.00 =    2828.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       57.35   12.25    3.631  0.74( 0.07) 0.10      17.5     120.00
      2       57.43   12.92    3.517  0.74( 0.07) 0.10      18.2     130.00
      3       56.77   13.61    3.409  0.74( 0.07) 0.10      18.5     110.00
      4       54.85   14.57    3.274  0.74( 0.07) 0.10      18.7     100.00
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    171.00 =    3283.00 FEET.
```

```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      203.56    9.45    4.245  0.74( 0.07) 0.10      51.1     143.00
      2      202.40   12.18    3.644  0.74( 0.07) 0.10      59.7     140.00
      3      202.37   12.25    3.631  0.74( 0.07) 0.10      59.9     120.00
      4      201.33   12.71    3.553  0.74( 0.07) 0.10      61.0     160.00
      5      199.89   12.92    3.517  0.74( 0.07) 0.10      61.2     130.00
      6      194.75   13.61    3.409  0.74( 0.07) 0.10      61.5     110.00
      7      187.22   14.57    3.274  0.74( 0.07) 0.10      61.7     100.00
    TOTAL AREA(ACRES) =        61.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      203.56  Tc(MIN.) =    9.446
  EFFECTIVE AREA(ACRES) =     51.06  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       61.7
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    171.00 =    3283.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    171.00 TO NODE    171.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       61.7  TC(MIN.) =      9.45
  EFFECTIVE AREA(ACRES) =     51.06  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =     203.56

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      203.56    9.45    4.245  0.74( 0.07) 0.10      51.1     143.00
      2      202.40   12.18    3.644  0.74( 0.07) 0.10      59.7     140.00
      3      202.37   12.25    3.631  0.74( 0.07) 0.10      59.9     120.00
      4      201.33   12.71    3.553  0.74( 0.07) 0.10      61.0     160.00
      5      199.89   12.92    3.517  0.74( 0.07) 0.10      61.2     130.00
      6      194.75   13.61    3.409  0.74( 0.07) 0.10      61.5     110.00
      7      187.22   14.57    3.274  0.74( 0.07) 0.10      61.7     100.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* TEI JOB NO. 4021                                                      *
* PROPOSED CONDITION 100-YR STORM EVENT                                 *
* NODES 200-257                                                         *
 ************************************************************************

  FILE NAME: W:\4021\4021PR2C.DAT
  TIME/DATE OF STUDY: 09:10 11/07/2023
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.4000

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   649.00
  ELEVATION DATA: UPSTREAM(FEET) =   1135.86  DOWNSTREAM(FEET) =   1132.37

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.525
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.767
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.40      0.74     0.100    52   11.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.33
  TOTAL AREA(ACRES) =      0.40   PEAK FLOW RATE(CFS) =      1.33

************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1128.41  DOWNSTREAM(FEET) =  1128.30
  FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.78
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.33
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   11.75
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     686.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   11.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.724
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.10      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.10      SUBAREA RUNOFF(CFS) =    3.61
  EFFECTIVE AREA(ACRES) =      1.50   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.5       PEAK FLOW RATE(CFS) =       4.93

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    214.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1128.30  DOWNSTREAM(FEET) =  1127.99
  FLOW LENGTH(FEET) =   101.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.87
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.93
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =   12.18
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    214.00 =     787.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.18
  RAINFALL INTENSITY(INCH/HR) =   3.64
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.50
  TOTAL STREAM AREA(ACRES) =       1.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.93

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    211.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   863.00
  ELEVATION DATA: UPSTREAM(FEET) =   1155.00  DOWNSTREAM(FEET) =   1138.91

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.073
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.084
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.70      0.74     0.100    52   10.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.53
  TOTAL AREA(ACRES) =      0.70   PEAK FLOW RATE(CFS) =      2.53
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    211.00 TO NODE    212.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1138.91  DOWNSTREAM ELEVATION(FEET) = 1132.12
  STREET LENGTH(FEET) =   770.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.21
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   12.43
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.43
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.99
  STREET FLOW TRAVEL TIME(MIN.) =   5.29   Tc(MIN.) =   15.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.171
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.20      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.20      SUBAREA RUNOFF(CFS) =    3.34
  EFFECTIVE AREA(ACRES) =      1.90    AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.9        PEAK FLOW RATE(CFS) =       5.30

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  13.68
  FLOW VELOCITY(FEET/SEC.) =  2.57   DEPTH*VELOCITY(FT*FT/SEC.) =   1.11
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    212.00 =    1633.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    213.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1128.12  DOWNSTREAM(FEET) =  1128.08
  FLOW LENGTH(FEET) =    31.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.82
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.30
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   15.54
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    213.00 =    1664.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    213.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.54
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.148
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.70      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.70      SUBAREA RUNOFF(CFS) =    1.94
  EFFECTIVE AREA(ACRES) =      2.60   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.6       PEAK FLOW RATE(CFS) =       7.19

****************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    214.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1128.08  DOWNSTREAM(FEET) =  1127.98
  FLOW LENGTH(FEET) =    66.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.27
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.19
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   15.88
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    214.00 =    1730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.88
  RAINFALL INTENSITY(INCH/HR) =   3.11
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       2.60
  TOTAL STREAM AREA(ACRES) =       2.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.19

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        4.93   12.18    3.644  0.74( 0.07) 0.10       1.5     200.00
      2        7.19   15.88    3.108  0.74( 0.07) 0.10       2.6     210.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       11.42   12.18    3.644  0.74( 0.07) 0.10       3.5     200.00
      2       11.38   15.88    3.108  0.74( 0.07) 0.10       4.1     210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.42    Tc(MIN.) =    12.18
  EFFECTIVE AREA(ACRES) =       3.49   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =         4.1
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    214.00 =    1730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    215.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1127.97  DOWNSTREAM(FEET) =  1120.10
  FLOW LENGTH(FEET) =  1067.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.63
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.42
  PIPE TRAVEL TIME(MIN.) =   2.68    Tc(MIN.) =   14.86
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    215.00 =    2797.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    215.00 TO NODE    215.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =   14.86
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.234
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.20      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.20      SUBAREA RUNOFF(CFS) =    3.41
  EFFECTIVE AREA(ACRES) =      4.69   AREA-AVERAGED Fm(INCH/HR) =  0.07
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.3       PEAK FLOW RATE(CFS) =      13.35

****************************************************************************
  FLOW PROCESS FROM NODE    215.00 TO NODE    216.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1120.10  DOWNSTREAM(FEET) =  1119.70
  FLOW LENGTH(FEET) =    24.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.21
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.35
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   14.91
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    216.00 =    2821.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    216.00 TO NODE    216.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.228
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.20      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.20      SUBAREA RUNOFF(CFS) =    6.25
  EFFECTIVE AREA(ACRES) =      6.89   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5       PEAK FLOW RATE(CFS) =      19.57

****************************************************************************
  FLOW PROCESS FROM NODE    216.00 TO NODE    241.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1119.63  DOWNSTREAM(FEET) =  1117.56
  FLOW LENGTH(FEET) =   110.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.72
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.57
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   15.08
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    241.00 =    2931.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    241.00 TO NODE    241.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   184.00
  ELEVATION DATA: UPSTREAM(FEET) =   1138.10  DOWNSTREAM(FEET) =   1132.47

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.000
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.218
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        1.00      0.74     0.100    52    5.00
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.53
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      5.53

****************************************************************************
```

```
 FLOW PROCESS FROM NODE    221.00 TO NODE    222.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1127.28  DOWNSTREAM(FEET) =  1125.71
 FLOW LENGTH(FEET) =   313.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.82
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       5.53
 PIPE TRAVEL TIME(MIN.) =   1.08    Tc(MIN.) =    6.08
 LONGEST FLOWPATH FROM NODE    220.00 TO NODE    222.00 =     497.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    222.00 TO NODE    222.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    6.08
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.528
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 A        0.40      0.74     0.100    52
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.40      SUBAREA RUNOFF(CFS) =    1.96
 EFFECTIVE AREA(ACRES) =      1.40   AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.4       PEAK FLOW RATE(CFS) =       6.87

****************************************************************************
 FLOW PROCESS FROM NODE    222.00 TO NODE    223.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1125.71  DOWNSTREAM(FEET) =  1122.43
 FLOW LENGTH(FEET) =   658.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.00
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.87
 PIPE TRAVEL TIME(MIN.) =   2.19    Tc(MIN.) =    8.28
 LONGEST FLOWPATH FROM NODE    220.00 TO NODE    223.00 =    1155.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    223.00 TO NODE    223.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    8.28
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.595
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 A        3.70      0.74     0.100    52
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    3.70      SUBAREA RUNOFF(CFS) =   15.06
 EFFECTIVE AREA(ACRES) =      5.10   AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        5.1       PEAK FLOW RATE(CFS) =      20.75

****************************************************************************
 FLOW PROCESS FROM NODE    223.00 TO NODE    224.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1122.43  DOWNSTREAM(FEET) =  1121.33
 FLOW LENGTH(FEET) =   224.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.53
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      20.75
 PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =    8.85
 LONGEST FLOWPATH FROM NODE    220.00 TO NODE    224.00 =    1379.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    224.00 TO NODE    224.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.85
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.415
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.90      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    7.42
  EFFECTIVE AREA(ACRES) =      7.00   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.0       PEAK FLOW RATE(CFS) =      27.35

****************************************************************************
  FLOW PROCESS FROM NODE    224.00 TO NODE    225.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1121.31  DOWNSTREAM(FEET) =  1120.21
  FLOW LENGTH(FEET) =   224.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.00
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      27.35
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    9.38
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    225.00 =    1603.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    225.00 TO NODE    225.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.263
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.80      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.80      SUBAREA RUNOFF(CFS) =    6.79
  EFFECTIVE AREA(ACRES) =      8.80   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        8.8       PEAK FLOW RATE(CFS) =      33.17

****************************************************************************
  FLOW PROCESS FROM NODE    225.00 TO NODE    226.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1120.19  DOWNSTREAM(FEET) =  1119.09
  FLOW LENGTH(FEET) =   224.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.40
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.17
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =    9.89
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    226.00 =    1827.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    226.00 TO NODE    226.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.131
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.50      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.50      SUBAREA RUNOFF(CFS) =    9.13
  EFFECTIVE AREA(ACRES) =     11.30   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       11.3       PEAK FLOW RATE(CFS) =      41.25

****************************************************************************
  FLOW PROCESS FROM NODE    226.00 TO NODE    240.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1119.07  DOWNSTREAM(FEET) =  1118.03
  FLOW LENGTH(FEET) =   212.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.82
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.25
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   10.34
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    240.00 =    2039.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    240.00 TO NODE    240.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.34
  RAINFALL INTENSITY(INCH/HR) =   4.02
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      11.30
  TOTAL STREAM AREA(ACRES) =      11.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      41.25

****************************************************************************
  FLOW PROCESS FROM NODE    230.00 TO NODE    231.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   195.00
  ELEVATION DATA: UPSTREAM(FEET) =   1135.44  DOWNSTREAM(FEET) =   1130.11

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    5.147
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  6.111
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        1.40      0.74     0.100    52    5.15
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      7.61
  TOTAL AREA(ACRES) =      1.40   PEAK FLOW RATE(CFS) =      7.61

****************************************************************************
  FLOW PROCESS FROM NODE    231.00 TO NODE    232.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1126.12  DOWNSTREAM(FEET) =  1125.53
  FLOW LENGTH(FEET) =   147.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.80
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.61
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =    5.66
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    232.00 =     342.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    232.00 TO NODE    232.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    5.66
```

```
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.773
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.40      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.40      SUBAREA RUNOFF(CFS) =    7.18
  EFFECTIVE AREA(ACRES) =      2.80   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.8       PEAK FLOW RATE(CFS) =      14.36

****************************************************************************
  FLOW PROCESS FROM NODE    232.00 TO NODE    233.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1125.51  DOWNSTREAM(FEET) =  1124.98
  FLOW LENGTH(FEET) =   128.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.56
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.36
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    6.04
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    233.00 =     470.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    233.00 TO NODE    233.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.04
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.551
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.10      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.10      SUBAREA RUNOFF(CFS) =    5.42
  EFFECTIVE AREA(ACRES) =      3.90   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        3.9       PEAK FLOW RATE(CFS) =      19.22

****************************************************************************
  FLOW PROCESS FROM NODE    233.00 TO NODE    234.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1124.98  DOWNSTREAM(FEET) =  1124.47
  FLOW LENGTH(FEET) =   128.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.90
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.22
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    6.40
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    234.00 =     598.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    234.00 TO NODE    234.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.360
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.10      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.10      SUBAREA RUNOFF(CFS) =    5.23
  EFFECTIVE AREA(ACRES) =      5.00   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.0       PEAK FLOW RATE(CFS) =      23.79

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    234.00 TO NODE    235.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1124.45  DOWNSTREAM(FEET) =  1123.93
  FLOW LENGTH(FEET) =   128.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.33
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.79
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    6.74
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    235.00 =     726.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    235.00 TO NODE    235.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    6.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.198
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.40      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.40      SUBAREA RUNOFF(CFS) =    6.46
  EFFECTIVE AREA(ACRES) =      6.40   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.4       PEAK FLOW RATE(CFS) =      29.51

****************************************************************************
  FLOW PROCESS FROM NODE    235.00 TO NODE    236.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1123.93  DOWNSTREAM(FEET) =  1123.41
  FLOW LENGTH(FEET) =   128.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.70
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.51
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    7.06
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    236.00 =     854.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    236.00 TO NODE    236.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.06
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.056
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.10      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.10      SUBAREA RUNOFF(CFS) =    4.93
  EFFECTIVE AREA(ACRES) =      7.50   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5       PEAK FLOW RATE(CFS) =      33.63

****************************************************************************
  FLOW PROCESS FROM NODE    236.00 TO NODE    237.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1123.39  DOWNSTREAM(FEET) =  1122.87
  FLOW LENGTH(FEET) =   128.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.82
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.63
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    7.37
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    237.00 =     982.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    237.00 TO NODE    237.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.926
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.40      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.40      SUBAREA RUNOFF(CFS) =    6.11
  EFFECTIVE AREA(ACRES) =      8.90   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        8.9       PEAK FLOW RATE(CFS) =      38.86

****************************************************************************
  FLOW PROCESS FROM NODE    237.00 TO NODE    238.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1122.87  DOWNSTREAM(FEET) =  1122.56
  FLOW LENGTH(FEET) =    71.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.37
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      38.86
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    7.53
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    238.00 =    1053.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    238.00 TO NODE    238.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.53
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.863
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.00      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    4.31
  EFFECTIVE AREA(ACRES) =      9.90   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        9.9       PEAK FLOW RATE(CFS) =      42.67

****************************************************************************
  FLOW PROCESS FROM NODE    238.00 TO NODE    239.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1122.55  DOWNSTREAM(FEET) =  1119.59
  FLOW LENGTH(FEET) =   578.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.00
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.67
  PIPE TRAVEL TIME(MIN.) =   1.20    Tc(MIN.) =    8.74
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    239.00 =    1631.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    239.00 TO NODE    239.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.449
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.00      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    3.94
  EFFECTIVE AREA(ACRES) =     10.90   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       10.9       PEAK FLOW RATE(CFS) =      42.92

****************************************************************************
  FLOW PROCESS FROM NODE    239.00 TO NODE    240.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1119.59  DOWNSTREAM(FEET) =  1117.96
  FLOW LENGTH(FEET) =   189.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.76
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.92
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    9.06
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    240.00 =    1820.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    240.00 TO NODE    240.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.06
  RAINFALL INTENSITY(INCH/HR) =   4.35
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      10.90
  TOTAL STREAM AREA(ACRES) =      10.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      42.92

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       41.25   10.34    4.021  0.74( 0.07) 0.10      11.3     220.00
      2       42.92    9.06    4.353  0.74( 0.07) 0.10      10.9     230.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       82.10    9.06    4.353  0.74( 0.07) 0.10      20.8     230.00
      2       80.84   10.34    4.021  0.74( 0.07) 0.10      22.2     220.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      82.10    Tc(MIN.) =     9.06
  EFFECTIVE AREA(ACRES) =      20.80   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       22.2
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    240.00 =    2039.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    240.00 TO NODE    241.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1118.01  DOWNSTREAM(FEET) =  1117.50
  FLOW LENGTH(FEET) =   103.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.23
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      82.10
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    9.24
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    241.00 =    2142.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    241.00 TO NODE    241.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
```

```
==============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       82.10    9.24    4.300  0.74( 0.07) 0.10       20.8     230.00
      2       80.84   10.52    3.978  0.74( 0.07) 0.10       22.2     220.00
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    241.00 =    2142.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       19.57   15.08    3.206  0.74( 0.07) 0.10        6.9     200.00
      2       18.58   18.78    2.811  0.74( 0.07) 0.10        7.5     210.00
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    241.00 =    2931.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       98.29    9.24    4.300  0.74( 0.07) 0.10       25.0     230.00
      2       97.87   10.52    3.978  0.74( 0.07) 0.10       27.0     220.00
      3       84.43   15.08    3.206  0.74( 0.07) 0.10       29.1     200.00
      4       75.24   18.78    2.811  0.74( 0.07) 0.10       29.7     210.00
    TOTAL AREA(ACRES) =        29.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       98.29  Tc(MIN.) =    9.244
  EFFECTIVE AREA(ACRES) =     25.03  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       29.7
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    241.00 =    2931.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    241.00 TO NODE    241.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    241.00 TO NODE    256.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1117.46  DOWNSTREAM(FEET) =  1108.04
  FLOW LENGTH(FEET) =   127.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.90
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      98.29
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.32
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    256.00 =    3058.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    256.00 TO NODE    256.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.32
  RAINFALL INTENSITY(INCH/HR) =   4.28
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      25.03
  TOTAL STREAM AREA(ACRES) =      29.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      98.29

****************************************************************************
  FLOW PROCESS FROM NODE    250.00 TO NODE    251.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   386.00
  ELEVATION DATA: UPSTREAM(FEET) =   1141.10  DOWNSTREAM(FEET) =   1138.84

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.205
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.311
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.50      0.74     0.100    52    9.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.91
  TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      1.91

****************************************************************************
  FLOW PROCESS FROM NODE    251.00 TO NODE    252.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1132.84  DOWNSTREAM(FEET) =  1132.68
  FLOW LENGTH(FEET) =    36.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.52
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.91
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    9.38
  LONGEST FLOWPATH FROM NODE    250.00 TO NODE    252.00 =     422.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    252.00 TO NODE    252.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.264
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.50      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.50      SUBAREA RUNOFF(CFS) =    5.66
  EFFECTIVE AREA(ACRES) =      2.00   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.0       PEAK FLOW RATE(CFS) =       7.54

****************************************************************************
  FLOW PROCESS FROM NODE    252.00 TO NODE    252.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.264
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        5.30      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    5.30      SUBAREA RUNOFF(CFS) =   19.99
  EFFECTIVE AREA(ACRES) =      7.30   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.3       PEAK FLOW RATE(CFS) =      27.53

****************************************************************************
  FLOW PROCESS FROM NODE    252.00 TO NODE    253.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1132.65  DOWNSTREAM(FEET) =  1129.04
  FLOW LENGTH(FEET) =   725.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.05
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      27.53
  PIPE TRAVEL TIME(MIN.) =   1.71    Tc(MIN.) =   11.09
  LONGEST FLOWPATH FROM NODE    250.00 TO NODE    253.00 =    1147.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    253.00 TO NODE    253.00 IS CODE =  81
```

```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   11.09
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.855
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.70      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.70      SUBAREA RUNOFF(CFS) =    2.38
  EFFECTIVE AREA(ACRES) =      8.00   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        8.0       PEAK FLOW RATE(CFS) =      27.53
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    253.00 TO NODE    254.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1129.04  DOWNSTREAM(FEET) =  1128.92
  FLOW LENGTH(FEET) =    24.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.06
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      27.53
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   11.15
  LONGEST FLOWPATH FROM NODE    250.00 TO NODE    254.00 =    1171.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    254.00 TO NODE    254.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   11.15
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.844
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.50      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.50      SUBAREA RUNOFF(CFS) =    1.70
  EFFECTIVE AREA(ACRES) =      8.50   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        8.5       PEAK FLOW RATE(CFS) =      28.84

****************************************************************************
  FLOW PROCESS FROM NODE    254.00 TO NODE    254.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   11.15
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.844
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        6.80      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    6.80      SUBAREA RUNOFF(CFS) =   23.07
  EFFECTIVE AREA(ACRES) =     15.30   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       15.3       PEAK FLOW RATE(CFS) =      51.91

****************************************************************************
  FLOW PROCESS FROM NODE    254.00 TO NODE    255.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1128.92  DOWNSTREAM(FEET) =  1127.04
  FLOW LENGTH(FEET) =   379.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.31
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      51.91
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   11.91
  LONGEST FLOWPATH FROM NODE    250.00 TO NODE    255.00 =    1550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    255.00 TO NODE    255.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   11.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.694
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.90      0.74     0.100    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    6.19
  EFFECTIVE AREA(ACRES) =     17.20   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       17.2       PEAK FLOW RATE(CFS) =      56.04

****************************************************************************
  FLOW PROCESS FROM NODE    255.00 TO NODE    256.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1127.02  DOWNSTREAM(FEET) =  1108.26
  FLOW LENGTH(FEET) =   869.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.64
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      56.04
  PIPE TRAVEL TIME(MIN.) =   0.99    Tc(MIN.) =   12.90
  LONGEST FLOWPATH FROM NODE    250.00 TO NODE    256.00 =    2419.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    256.00 TO NODE    256.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.90
  RAINFALL INTENSITY(INCH/HR) =   3.52
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      17.20
  TOTAL STREAM AREA(ACRES) =      17.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      56.04

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       98.29    9.32    4.278  0.74( 0.07) 0.10      25.0     230.00
      1       97.87   10.60    3.961  0.74( 0.07) 0.10      27.0     220.00
      1       84.43   15.16    3.196  0.74( 0.07) 0.10      29.1     200.00
      1       75.24   18.86    2.803  0.74( 0.07) 0.10      29.7     210.00
      2       56.04   12.90    3.522  0.74( 0.07) 0.10      17.2     250.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      147.70    9.32    4.278  0.74( 0.07) 0.10      37.5     230.00
      2      149.81   10.60    3.961  0.74( 0.07) 0.10      41.2     220.00
      3      147.15   12.90    3.522  0.74( 0.07) 0.10      45.3     250.00
      4      135.17   15.16    3.196  0.74( 0.07) 0.10      46.3     200.00
      5      119.60   18.86    2.803  0.74( 0.07) 0.10      46.9     210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     149.81    Tc(MIN.) =    10.60
  EFFECTIVE AREA(ACRES) =      41.15   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.10
```

```
  TOTAL AREA(ACRES) =       46.9
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    256.00 =    3058.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    256.00 TO NODE    257.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1107.99  DOWNSTREAM(FEET) =  1107.00
  FLOW LENGTH(FEET) =   200.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  41.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.76
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     149.81
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =   10.91
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    257.00 =    3258.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       46.9  TC(MIN.) =     10.91
  EFFECTIVE AREA(ACRES) =     41.15  AREA-AVERAGED Fm(INCH/HR)=  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =     149.81

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      147.70    9.63    4.195  0.74( 0.07) 0.10      37.5     230.00
      2      149.81   10.91    3.893  0.74( 0.07) 0.10      41.2     220.00
      3      147.15   13.21    3.472  0.74( 0.07) 0.10      45.3     250.00
      4      135.17   15.48    3.156  0.74( 0.07) 0.10      46.3     200.00
      5      119.60   19.19    2.774  0.74( 0.07) 0.10      46.9     210.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX C

DETENTION CALCULATIONS

Arrow Rt. and Juneberry Dr. - Rancho Cucamonga
Basin Rating Curve

Building 4 - Nodes 140-153 - Line F Sta. 15+02.10

Elevation (ft)	Depth (ft)	Storage (cu-ft)	Storage (ac-ft)	Type SD Orifice C 0.60 Storm Drain Diameter (in) 24 Invert (ft) 1129.83 Discharge (cfs)
1137.98	0.00	0	0.000	43.184
1138.08	0.10	25	0.001	43.448
1138.18	0.20	941	0.022	43.711
1138.28	0.30	3,699	0.085	43.972
1138.38	0.40	8,500	0.195	44.231
1138.48	0.50	15,339	0.352	44.489
1138.58	0.60	23,962	0.550	44.745
1138.68	0.70	33,707	0.774	45.000

```
******************************************************************************

            F L O O D    R O U T I N G    A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* ARROW RT. AND JUNEBERRY DR. - RANCHO CUCAMONGA                        *
* PROPOSED CONDITION - BUILDING 4 - NODES 140-153                       *
* HYDROLOGIC ANALYSIS - 100-YEAR                                        *
 ************************************************************************

  FILE NAME: 4021P1AC.FLD
  TIME/DATE OF STUDY: 10:00 11/09/2023

   The Small Area Unit Hydrograph Procedures in Section J
   of the Hydrology Manual provides estimates of runoff
   hydrograph and runoff volume for watersheds whose time of
   concentration is less than 25 minutes. The PROGRAM User
   should check the applicability of using the small area unit
   hydrograph procedures, and follow the guidelines in
   Sections J and K.5 in complex watershed modeling.


******************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    153.00 IS CODE = 1.2
------------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (SMALL AREA UNIT-HYDROGRAPH ANALYSIS) <<<<<
==============================================================================

  (SMALL AREA UNIT-HYDROGRAPH ADDED TO STREAM #1)

    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   25.50
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.074
    LOW LOSS FRACTION = 0.126
    TIME OF CONCENTRATION(MIN.) = 11.20
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED:
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.51
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  1.05
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.40
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.50
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  8.20

------------------------------------------------------------------------------
    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    13.82
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     3.61

------------------------------------------------------------------------------
♠
==============================================================================

                     2 4 - H O U R    S T O R M
                  R U N O F F    H Y D R O G R A P H

==============================================================================
              HYDROGRAPH IN  ONE-MINUTE UNIT INTERVALS(CFS)
        (Notes: Time indicated is at END of Each Unit Intervals.
                Peak 5-minute rainfall intensity is modeled as
                a constant value for entire 5-minute period.)
------------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       21.3      42.5      63.8      85.1
------------------------------------------------------------------------------
   0.017      0.0003      0.24  Q         .         .         .         .
   0.033      0.0013      0.73  Q         .         .         .         .
   0.050      0.0030      1.21  Q         .         .         .         .
   0.067      0.0053      1.69  Q         .         .         .         .
```

0.083	0.0083	2.18	VQ	.	.	.	.
0.100	0.0120	2.66	VQ	.	.	.	.
0.117	0.0163	3.15	VQ	.	.	.	.
0.133	0.0213	3.63	VQ	.	.	.	.
0.150	0.0267	3.87	VQ	.	.	.	.
0.167	0.0320	3.87	VQ	.	.	.	.
0.183	0.0373	3.87	VQ	.	.	.	.
0.200	0.0427	3.87	VQ	.	.	.	.
0.217	0.0480	3.88	VQ	.	.	.	.
0.233	0.0534	3.88	VQ	.	.	.	.
0.250	0.0587	3.88	VQ	.	.	.	.
0.267	0.0640	3.88	VQ	.	.	.	.
0.283	0.0694	3.88	VQ	.	.	.	.
0.300	0.0747	3.88	VQ	.	.	.	.
0.317	0.0801	3.88	VQ	.	.	.	.
0.333	0.0854	3.88	VQ	.	.	.	.
0.350	0.0908	3.88	VQ	.	.	.	.
0.367	0.0961	3.89	VQ	.	.	.	.
0.383	0.1015	3.89	VQ	.	.	.	.
0.400	0.1068	3.89	VQ	.	.	.	.
0.417	0.1122	3.89	VQ	.	.	.	.
0.433	0.1176	3.90	VQ	.	.	.	.
0.450	0.1229	3.90	VQ	.	.	.	.
0.467	0.1283	3.90	VQ	.	.	.	.
0.483	0.1337	3.90	VQ	.	.	.	.
0.500	0.1391	3.91	VQ	.	.	.	.
0.517	0.1445	3.91	VQ	.	.	.	.
0.533	0.1498	3.91	VQ	.	.	.	.
0.550	0.1552	3.91	VQ	.	.	.	.
0.567	0.1606	3.91	VQ	.	.	.	.
0.583	0.1660	3.91	VQ	.	.	.	.
0.600	0.1714	3.91	VQ	.	.	.	.
0.617	0.1768	3.92	VQ	.	.	.	.
0.633	0.1822	3.92	VQ	.	.	.	.
0.650	0.1876	3.92	VQ	.	.	.	.
0.667	0.1930	3.92	VQ	.	.	.	.
0.683	0.1984	3.92	VQ	.	.	.	.
0.700	0.2038	3.92	VQ	.	.	.	.
0.717	0.2092	3.92	VQ	.	.	.	.
0.733	0.2146	3.93	VQ	.	.	.	.
0.750	0.2200	3.93	VQ	.	.	.	.
0.767	0.2254	3.93	VQ	.	.	.	.
0.783	0.2309	3.93	VQ	.	.	.	.
0.800	0.2363	3.94	VQ	.	.	.	.
0.817	0.2417	3.94	VQ	.	.	.	.
0.833	0.2471	3.94	VQ	.	.	.	.
0.850	0.2526	3.94	VQ	.	.	.	.
0.867	0.2580	3.95	VQ	.	.	.	.
0.883	0.2634	3.95	VQ	.	.	.	.
0.900	0.2689	3.95	VQ	.	.	.	.
0.917	0.2743	3.95	VQ	.	.	.	.
0.933	0.2798	3.95	VQ	.	.	.	.
0.950	0.2852	3.95	VQ	.	.	.	.
0.967	0.2907	3.96	VQ	.	.	.	.
0.983	0.2961	3.96	VQ	.	.	.	.
1.000	0.3016	3.96	VQ	.	.	.	.
1.017	0.3070	3.96	VQ	.	.	.	.
1.033	0.3125	3.96	VQ	.	.	.	.
1.050	0.3179	3.96	VQ	.	.	.	.
1.067	0.3234	3.96	VQ	.	.	.	.
1.083	0.3289	3.97	VQ	.	.	.	.
1.100	0.3343	3.97	VQ	.	.	.	.
1.117	0.3398	3.97	VQ	.	.	.	.
1.133	0.3453	3.97	VQ	.	.	.	.
1.150	0.3508	3.98	.Q	.	.	.	.
1.167	0.3562	3.98	.Q	.	.	.	.
1.183	0.3617	3.98	.Q	.	.	.	.
1.200	0.3672	3.98	.Q	.	.	.	.
1.217	0.3727	3.99	.Q	.	.	.	.
1.233	0.3782	3.99	.Q	.	.	.	.
1.250	0.3837	3.99	.Q	.	.	.	.
1.267	0.3892	3.99	.Q	.	.	.	.
1.283	0.3947	3.99	.Q	.	.	.	.
1.300	0.4002	4.00	.Q	.	.	.	.
1.317	0.4057	4.00	.Q	.	.	.	.
1.333	0.4112	4.00	.Q	.	.	.	.
1.350	0.4167	4.00	.Q	.	.	.	.
1.367	0.4222	4.00	.Q	.	.	.	.
1.383	0.4277	4.00	.Q	.	.	.	.

1.400	0.4333	4.00	.Q	.	.	.	.
1.417	0.4388	4.01	.Q	.	.	.	.
1.433	0.4443	4.01	.Q	.	.	.	.
1.450	0.4498	4.01	.Q	.	.	.	.
1.467	0.4553	4.01	.Q	.	.	.	.
1.483	0.4609	4.01	.Q	.	.	.	.
1.500	0.4664	4.02	.Q	.	.	.	.
1.517	0.4719	4.02	.Q	.	.	.	.
1.533	0.4775	4.02	.Q	.	.	.	.
1.550	0.4830	4.02	.Q	.	.	.	.
1.567	0.4886	4.03	.Q	.	.	.	.
1.583	0.4941	4.03	.Q	.	.	.	.
1.600	0.4997	4.03	.Q	.	.	.	.
1.617	0.5052	4.03	.Q	.	.	.	.
1.633	0.5108	4.04	.Q	.	.	.	.
1.650	0.5163	4.04	.Q	.	.	.	.
1.667	0.5219	4.04	.Q	.	.	.	.
1.683	0.5275	4.04	.Q	.	.	.	.
1.700	0.5330	4.04	.Q	.	.	.	.
1.717	0.5386	4.04	.Q	.	.	.	.
1.733	0.5442	4.05	.Q	.	.	.	.
1.750	0.5498	4.05	.Q	.	.	.	.
1.767	0.5553	4.05	.Q	.	.	.	.
1.783	0.5609	4.05	.Q	.	.	.	.
1.800	0.5665	4.05	.Q	.	.	.	.
1.817	0.5721	4.05	.Q	.	.	.	.
1.833	0.5777	4.05	.Q	.	.	.	.
1.850	0.5832	4.06	.Q	.	.	.	.
1.867	0.5888	4.06	.Q	.	.	.	.
1.883	0.5944	4.06	.Q	.	.	.	.
1.900	0.6000	4.07	.Q	.	.	.	.
1.917	0.6056	4.07	.Q	.	.	.	.
1.933	0.6112	4.07	.Q	.	.	.	.
1.950	0.6169	4.07	.Q	.	.	.	.
1.967	0.6225	4.08	.Q	.	.	.	.
1.983	0.6281	4.08	.Q	.	.	.	.
2.000	0.6337	4.08	.Q	.	.	.	.
2.017	0.6393	4.08	.Q	.	.	.	.
2.033	0.6450	4.09	.Q	.	.	.	.
2.050	0.6506	4.09	.Q	.	.	.	.
2.067	0.6562	4.09	.Q	.	.	.	.
2.083	0.6619	4.09	.Q	.	.	.	.
2.100	0.6675	4.09	.Q	.	.	.	.
2.117	0.6731	4.09	.Q	.	.	.	.
2.133	0.6788	4.09	.Q	.	.	.	.
2.150	0.6844	4.10	.Q	.	.	.	.
2.167	0.6901	4.10	.Q	.	.	.	.
2.183	0.6957	4.10	.QV	.	.	.	.
2.200	0.7014	4.10	.QV	.	.	.	.
2.217	0.7070	4.10	.QV	.	.	.	.
2.233	0.7127	4.11	.QV	.	.	.	.
2.250	0.7183	4.11	.QV	.	.	.	.
2.267	0.7240	4.11	.QV	.	.	.	.
2.283	0.7297	4.11	.QV	.	.	.	.
2.300	0.7353	4.12	.QV	.	.	.	.
2.317	0.7410	4.12	.QV	.	.	.	.
2.333	0.7467	4.12	.QV	.	.	.	.
2.350	0.7524	4.13	.QV	.	.	.	.
2.367	0.7581	4.13	.QV	.	.	.	.
2.383	0.7637	4.13	.QV	.	.	.	.
2.400	0.7694	4.13	.QV	.	.	.	.
2.417	0.7751	4.13	.QV	.	.	.	.
2.433	0.7808	4.14	.QV	.	.	.	.
2.450	0.7865	4.14	.QV	.	.	.	.
2.467	0.7922	4.14	.QV	.	.	.	.
2.483	0.7979	4.14	.QV	.	.	.	.
2.500	0.8036	4.14	.QV	.	.	.	.
2.517	0.8093	4.14	.QV	.	.	.	.
2.533	0.8151	4.14	.QV	.	.	.	.
2.550	0.8208	4.15	.QV	.	.	.	.
2.567	0.8265	4.15	.QV	.	.	.	.
2.583	0.8322	4.15	.QV	.	.	.	.
2.600	0.8379	4.15	.QV	.	.	.	.
2.617	0.8436	4.16	.QV	.	.	.	.
2.633	0.8494	4.16	.QV	.	.	.	.
2.650	0.8551	4.16	.QV	.	.	.	.
2.667	0.8608	4.17	.QV	.	.	.	.
2.683	0.8666	4.17	.QV	.	.	.	.
2.700	0.8723	4.17	.QV	.	.	.	.

2.717	0.8781	4.17	.QV	.	.	.	.
2.733	0.8838	4.18	.QV	.	.	.	.
2.750	0.8896	4.18	.QV	.	.	.	.
2.767	0.8953	4.18	.QV	.	.	.	.
2.783	0.9011	4.18	.QV	.	.	.	.
2.800	0.9069	4.19	.QV	.	.	.	.
2.817	0.9126	4.19	.QV	.	.	.	.
2.833	0.9184	4.19	.QV	.	.	.	.
2.850	0.9242	4.19	.QV	.	.	.	.
2.867	0.9300	4.19	.QV	.	.	.	.
2.883	0.9357	4.19	.QV	.	.	.	.
2.900	0.9415	4.19	.QV	.	.	.	.
2.917	0.9473	4.20	.QV	.	.	.	.
2.933	0.9531	4.20	.QV	.	.	.	.
2.950	0.9589	4.20	.QV	.	.	.	.
2.967	0.9646	4.20	.QV	.	.	.	.
2.983	0.9704	4.21	.QV	.	.	.	.
3.000	0.9762	4.21	.QV	.	.	.	.
3.017	0.9820	4.21	.QV	.	.	.	.
3.033	0.9879	4.22	.QV	.	.	.	.
3.050	0.9937	4.22	.QV	.	.	.	.
3.067	0.9995	4.22	.QV	.	.	.	.
3.083	1.0053	4.22	.QV	.	.	.	.
3.100	1.0111	4.23	.QV	.	.	.	.
3.117	1.0169	4.23	.QV	.	.	.	.
3.133	1.0228	4.23	.QV	.	.	.	.
3.150	1.0286	4.24	.QV	.	.	.	.
3.167	1.0345	4.24	.QV	.	.	.	.
3.183	1.0403	4.24	.Q V	.	.	.	.
3.200	1.0461	4.24	.Q V	.	.	.	.
3.217	1.0520	4.24	.Q V	.	.	.	.
3.233	1.0578	4.24	.Q V	.	.	.	.
3.250	1.0637	4.24	.Q V	.	.	.	.
3.267	1.0695	4.25	.Q V	.	.	.	.
3.283	1.0754	4.25	.Q V	.	.	.	.
3.300	1.0812	4.25	.Q V	.	.	.	.
3.317	1.0871	4.25	.Q V	.	.	.	.
3.333	1.0929	4.25	. QV	.	.	.	.
3.350	1.0988	4.26	. QV	.	.	.	.
3.367	1.1047	4.26	. QV	.	.	.	.
3.383	1.1105	4.26	. QV	.	.	.	.
3.400	1.1164	4.27	. QV	.	.	.	.
3.417	1.1223	4.27	. QV	.	.	.	.
3.433	1.1282	4.27	. QV	.	.	.	.
3.450	1.1341	4.28	. QV	.	.	.	.
3.467	1.1400	4.28	. QV	.	.	.	.
3.483	1.1459	4.28	. QV	.	.	.	.
3.500	1.1518	4.29	. QV	.	.	.	.
3.517	1.1577	4.29	. QV	.	.	.	.
3.533	1.1636	4.29	. QV	.	.	.	.
3.550	1.1695	4.29	. QV	.	.	.	.
3.567	1.1754	4.29	. QV	.	.	.	.
3.583	1.1813	4.30	. QV	.	.	.	.
3.600	1.1873	4.30	. QV	.	.	.	.
3.617	1.1932	4.30	. QV	.	.	.	.
3.633	1.1991	4.30	. QV	.	.	.	.
3.650	1.2050	4.30	. QV	.	.	.	.
3.667	1.2110	4.30	. QV	.	.	.	.
3.683	1.2169	4.31	. QV	.	.	.	.
3.700	1.2228	4.31	. QV	.	.	.	.
3.717	1.2288	4.31	. QV	.	.	.	.
3.733	1.2347	4.31	. QV	.	.	.	.
3.750	1.2407	4.32	. QV	.	.	.	.
3.767	1.2466	4.32	. QV	.	.	.	.
3.783	1.2526	4.33	. QV	.	.	.	.
3.800	1.2585	4.33	. QV	.	.	.	.
3.817	1.2645	4.33	. QV	.	.	.	.
3.833	1.2705	4.34	. QV	.	.	.	.
3.850	1.2764	4.34	. QV	.	.	.	.
3.867	1.2824	4.34	. QV	.	.	.	.
3.883	1.2884	4.34	. QV	.	.	.	.
3.900	1.2944	4.35	. QV	.	.	.	.
3.917	1.3004	4.35	. QV	.	.	.	.
3.933	1.3064	4.35	. QV	.	.	.	.
3.950	1.3124	4.35	. QV	.	.	.	.
3.967	1.3184	4.35	. QV	.	.	.	.
3.983	1.3244	4.35	. QV	.	.	.	.
4.000	1.3304	4.36	. QV	.	.	.	.
4.017	1.3364	4.36	. QV	.	.	.	.

4.033	1.3424	4.36	. QV	.	.	.	.
4.050	1.3484	4.36	. QV	.	.	.	.
4.067	1.3544	4.36	. QV	.	.	.	.
4.083	1.3604	4.37	. QV	.	.	.	.
4.100	1.3664	4.37	. QV	.	.	.	.
4.117	1.3725	4.37	. QV	.	.	.	.
4.133	1.3785	4.38	. QV	.	.	.	.
4.150	1.3845	4.38	. Q V	.	.	.	.
4.167	1.3906	4.39	. Q V	.	.	.	.
4.183	1.3966	4.39	. Q V	.	.	.	.
4.200	1.4027	4.39	. Q V	.	.	.	.
4.217	1.4087	4.40	. Q V	.	.	.	.
4.233	1.4148	4.40	. Q V	.	.	.	.
4.250	1.4208	4.40	. Q V	.	.	.	.
4.267	1.4269	4.40	. Q V	.	.	.	.
4.283	1.4330	4.41	. Q V	.	.	.	.
4.300	1.4390	4.41	. Q V	.	.	.	.
4.317	1.4451	4.41	. Q V	.	.	.	.
4.333	1.4512	4.41	. Q V	.	.	.	.
4.350	1.4573	4.41	. Q V	.	.	.	.
4.367	1.4634	4.42	. Q V	.	.	.	.
4.383	1.4694	4.42	. Q V	.	.	.	.
4.400	1.4755	4.42	. Q V	.	.	.	.
4.417	1.4816	4.42	. Q V	.	.	.	.
4.433	1.4877	4.42	. Q V	.	.	.	.
4.450	1.4938	4.43	. Q V	.	.	.	.
4.467	1.4999	4.43	. Q V	.	.	.	.
4.483	1.5060	4.43	. Q V	.	.	.	.
4.500	1.5121	4.44	. Q V	.	.	.	.
4.517	1.5182	4.44	. Q V	.	.	.	.
4.533	1.5244	4.44	. Q V	.	.	.	.
4.550	1.5305	4.45	. Q V	.	.	.	.
4.567	1.5366	4.45	. Q V	.	.	.	.
4.583	1.5428	4.46	. Q V	.	.	.	.
4.600	1.5489	4.46	. Q V	.	.	.	.
4.617	1.5551	4.46	. Q V	.	.	.	.
4.633	1.5612	4.47	. Q V	.	.	.	.
4.650	1.5674	4.47	. Q V	.	.	.	.
4.667	1.5735	4.47	. Q V	.	.	.	.
4.683	1.5797	4.47	. Q V	.	.	.	.
4.700	1.5858	4.47	. Q V	.	.	.	.
4.717	1.5920	4.48	. Q V	.	.	.	.
4.733	1.5982	4.48	. Q V	.	.	.	.
4.750	1.6043	4.48	. Q V	.	.	.	.
4.767	1.6105	4.48	. Q V	.	.	.	.
4.783	1.6167	4.48	. Q V	.	.	.	.
4.800	1.6229	4.48	. Q V	.	.	.	.
4.817	1.6290	4.49	. Q V	.	.	.	.
4.833	1.6352	4.49	. Q V	.	.	.	.
4.850	1.6414	4.50	. Q V	.	.	.	.
4.867	1.6476	4.50	. Q V	.	.	.	.
4.883	1.6538	4.50	. Q V	.	.	.	.
4.900	1.6600	4.51	. Q V	.	.	.	.
4.917	1.6662	4.51	. Q V	.	.	.	.
4.933	1.6725	4.51	. Q V	.	.	.	.
4.950	1.6787	4.52	. Q V	.	.	.	.
4.967	1.6849	4.52	. Q V	.	.	.	.
4.983	1.6911	4.53	. Q V	.	.	.	.
5.000	1.6974	4.53	. Q V	.	.	.	.
5.017	1.7036	4.53	. Q V	.	.	.	.
5.033	1.7099	4.53	. Q V	.	.	.	.
5.050	1.7161	4.54	. Q V	.	.	.	.
5.067	1.7224	4.54	. Q V	.	.	.	.
5.083	1.7286	4.54	. Q V	.	.	.	.
5.100	1.7349	4.54	. Q V	.	.	.	.
5.117	1.7411	4.54	. Q V	.	.	.	.
5.133	1.7474	4.55	. Q V	.	.	.	.
5.150	1.7537	4.55	. Q V	.	.	.	.
5.167	1.7599	4.55	. Q V	.	.	.	.
5.183	1.7662	4.55	. Q V	.	.	.	.
5.200	1.7725	4.56	. Q V	.	.	.	.
5.217	1.7787	4.56	. Q V	.	.	.	.
5.233	1.7850	4.56	. Q V	.	.	.	.
5.250	1.7913	4.57	. Q V	.	.	.	.
5.267	1.7976	4.57	. Q V	.	.	.	.
5.283	1.8039	4.58	. Q V	.	.	.	.
5.300	1.8102	4.58	. Q V	.	.	.	.
5.317	1.8165	4.58	. Q V	.	.	.	.
5.333	1.8229	4.59	. Q V	.	.	.	.

5.350	1.8292	4.59	.	Q	V	.	.	.	.
5.367	1.8355	4.60	.	Q	V	.	.	.	.
5.383	1.8419	4.60	.	Q	V	.	.	.	.
5.400	1.8482	4.60	.	Q	V	.	.	.	.
5.417	1.8545	4.60	.	Q	V	.	.	.	.
5.433	1.8609	4.60	.	Q	V	.	.	.	.
5.450	1.8672	4.61	.	Q	V	.	.	.	.
5.467	1.8736	4.61	.	Q	V	.	.	.	.
5.483	1.8799	4.61	.	Q	V	.	.	.	.
5.500	1.8863	4.61	.	Q	V	.	.	.	.
5.517	1.8926	4.62	.	Q	V	.	.	.	.
5.533	1.8990	4.62	.	Q	V	.	.	.	.
5.550	1.9054	4.62	.	Q	V	.	.	.	.
5.567	1.9117	4.62	.	Q	V	.	.	.	.
5.583	1.9181	4.63	.	Q	V	.	.	.	.
5.600	1.9245	4.63	.	Q	V	.	.	.	.
5.617	1.9309	4.64	.	Q	V	.	.	.	.
5.633	1.9373	4.64	.	Q	V	.	.	.	.
5.650	1.9436	4.64	.	Q	V	.	.	.	.
5.667	1.9501	4.65	.	Q	V	.	.	.	.
5.683	1.9565	4.65	.	Q	V	.	.	.	.
5.700	1.9629	4.66	.	Q	V	.	.	.	.
5.717	1.9693	4.66	.	Q	V	.	.	.	.
5.733	1.9757	4.67	.	Q	V	.	.	.	.
5.750	1.9822	4.67	.	Q	V	.	.	.	.
5.767	1.9886	4.67	.	Q	V	.	.	.	.
5.783	1.9950	4.67	.	Q	V	.	.	.	.
5.800	2.0015	4.68	.	Q	V	.	.	.	.
5.817	2.0079	4.68	.	Q	V	.	.	.	.
5.833	2.0144	4.68	.	Q	V	.	.	.	.
5.850	2.0208	4.68	.	Q	V	.	.	.	.
5.867	2.0273	4.68	.	Q	V	.	.	.	.
5.883	2.0337	4.69	.	Q	V	.	.	.	.
5.900	2.0402	4.69	.	Q	V	.	.	.	.
5.917	2.0466	4.69	.	Q	V	.	.	.	.
5.933	2.0531	4.69	.	Q	V	.	.	.	.
5.950	2.0596	4.70	.	Q	V	.	.	.	.
5.967	2.0660	4.70	.	Q	V	.	.	.	.
5.983	2.0725	4.71	.	Q	V	.	.	.	.
6.000	2.0790	4.71	.	Q	V	.	.	.	.
6.017	2.0855	4.72	.	Q	V	.	.	.	.
6.033	2.0920	4.72	.	Q	V	.	.	.	.
6.050	2.0985	4.73	.	Q	V	.	.	.	.
6.067	2.1050	4.73	.	Q	V	.	.	.	.
6.083	2.1116	4.73	.	Q	V	.	.	.	.
6.100	2.1181	4.74	.	Q	V	.	.	.	.
6.117	2.1246	4.74	.	Q	V	.	.	.	.
6.133	2.1312	4.75	.	Q	V	.	.	.	.
6.150	2.1377	4.75	.	Q	V	.	.	.	.
6.167	2.1442	4.75	.	Q	V	.	.	.	.
6.183	2.1508	4.75	.	Q	V	.	.	.	.
6.200	2.1573	4.75	.	Q	V	.	.	.	.
6.217	2.1639	4.76	.	Q	V	.	.	.	.
6.233	2.1704	4.76	.	Q	V	.	.	.	.
6.250	2.1770	4.76	.	Q	V	.	.	.	.
6.267	2.1836	4.76	.	Q	V	.	.	.	.
6.283	2.1901	4.77	.	Q	V	.	.	.	.
6.300	2.1967	4.77	.	Q	V	.	.	.	.
6.317	2.2033	4.77	.	Q	V	.	.	.	.
6.333	2.2099	4.78	.	Q	V	.	.	.	.
6.350	2.2164	4.78	.	Q	V	.	.	.	.
6.367	2.2230	4.79	.	Q	V	.	.	.	.
6.383	2.2296	4.79	.	Q	V	.	.	.	.
6.400	2.2362	4.80	.	Q	V	.	.	.	.
6.417	2.2429	4.80	.	Q	V	.	.	.	.
6.433	2.2495	4.81	.	Q	V	.	.	.	.
6.450	2.2561	4.81	.	Q	V	.	.	.	.
6.467	2.2627	4.82	.	Q	V	.	.	.	.
6.483	2.2694	4.82	.	Q	V	.	.	.	.
6.500	2.2760	4.82	.	Q	V	.	.	.	.
6.517	2.2827	4.83	.	Q	V	.	.	.	.
6.533	2.2893	4.83	.	Q	V	.	.	.	.
6.550	2.2960	4.83	.	Q	V	.	.	.	.
6.567	2.3026	4.83	.	Q	V	.	.	.	.
6.583	2.3093	4.84	.	Q	V	.	.	.	.
6.600	2.3160	4.84	.	Q	V	.	.	.	.
6.617	2.3226	4.84	.	Q	V	.	.	.	.
6.633	2.3293	4.84	.	Q	V	.	.	.	.
6.650	2.3360	4.85	.	Q	V	.	.	.	.

6.667	2.3427	4.85	.	Q	V	.	.	.	.
6.683	2.3493	4.85	.	Q	V	.	.	.	.
6.700	2.3560	4.86	.	Q	V	.	.	.	.
6.717	2.3627	4.86	.	Q	V	.	.	.	.
6.733	2.3694	4.87	.	Q	V	.	.	.	.
6.750	2.3761	4.87	.	Q	V	.	.	.	.
6.767	2.3829	4.88	.	Q	V	.	.	.	.
6.783	2.3896	4.88	.	Q	V	.	.	.	.
6.800	2.3963	4.89	.	Q	V	.	.	.	.
6.817	2.4030	4.89	.	Q	V	.	.	.	.
6.833	2.4098	4.90	.	Q	V	.	.	.	.
6.850	2.4165	4.90	.	Q	V	.	.	.	.
6.867	2.4233	4.91	.	Q	V	.	.	.	.
6.883	2.4301	4.91	.	Q	V	.	.	.	.
6.900	2.4368	4.91	.	Q	V	.	.	.	.
6.917	2.4436	4.91	.	Q	V	.	.	.	.
6.933	2.4504	4.92	.	Q	V	.	.	.	.
6.950	2.4571	4.92	.	Q	V	.	.	.	.
6.967	2.4639	4.92	.	Q	V	.	.	.	.
6.983	2.4707	4.92	.	Q	V	.	.	.	.
7.000	2.4775	4.93	.	Q	V	.	.	.	.
7.017	2.4843	4.93	.	Q	V	.	.	.	.
7.033	2.4911	4.93	.	Q	V	.	.	.	.
7.050	2.4979	4.94	.	Q	V	.	.	.	.
7.067	2.5047	4.94	.	Q	V	.	.	.	.
7.083	2.5115	4.95	.	Q	V	.	.	.	.
7.100	2.5183	4.95	.	Q	V	.	.	.	.
7.117	2.5251	4.96	.	Q	V	.	.	.	.
7.133	2.5320	4.96	.	Q	V	.	.	.	.
7.150	2.5388	4.97	.	Q	V	.	.	.	.
7.167	2.5457	4.97	.	Q	V	.	.	.	.
7.183	2.5525	4.98	.	Q	V	.	.	.	.
7.200	2.5594	4.98	.	Q	V	.	.	.	.
7.217	2.5663	4.99	.	Q	V	.	.	.	.
7.233	2.5731	4.99	.	Q	V	.	.	.	.
7.250	2.5800	5.00	.	Q	V	.	.	.	.
7.267	2.5869	5.00	.	Q	V	.	.	.	.
7.283	2.5938	5.00	.	Q	V	.	.	.	.
7.300	2.6007	5.01	.	Q	V	.	.	.	.
7.317	2.6076	5.01	.	Q	V	.	.	.	.
7.333	2.6145	5.01	.	Q	V	.	.	.	.
7.350	2.6214	5.01	.	Q	V	.	.	.	.
7.367	2.6283	5.02	.	Q	V	.	.	.	.
7.383	2.6352	5.02	.	Q	V	.	.	.	.
7.400	2.6421	5.02	.	Q	V	.	.	.	.
7.417	2.6491	5.02	.	Q	V	.	.	.	.
7.433	2.6560	5.03	.	Q	V	.	.	.	.
7.450	2.6629	5.03	.	Q	V	.	.	.	.
7.467	2.6699	5.04	.	Q	V	.	.	.	.
7.483	2.6768	5.05	.	Q	V	.	.	.	.
7.500	2.6838	5.05	.	Q	V	.	.	.	.
7.517	2.6907	5.06	.	Q	V	.	.	.	.
7.533	2.6977	5.06	.	Q	V	.	.	.	.
7.550	2.7047	5.07	.	Q	V	.	.	.	.
7.567	2.7117	5.07	.	Q	V	.	.	.	.
7.583	2.7187	5.08	.	Q	V	.	.	.	.
7.600	2.7257	5.09	.	Q	V	.	.	.	.
7.617	2.7327	5.09	.	Q	V	.	.	.	.
7.633	2.7397	5.09	.	Q	V	.	.	.	.
7.650	2.7467	5.10	.	Q	V	.	.	.	.
7.667	2.7538	5.10	.	Q	V	.	.	.	.
7.683	2.7608	5.10	.	Q	V	.	.	.	.
7.700	2.7678	5.10	.	Q	V	.	.	.	.
7.717	2.7748	5.11	.	Q	V	.	.	.	.
7.733	2.7819	5.11	.	Q	V	.	.	.	.
7.750	2.7889	5.11	.	Q	V	.	.	.	.
7.767	2.7960	5.12	.	Q	V	.	.	.	.
7.783	2.8030	5.12	.	Q	V	.	.	.	.
7.800	2.8101	5.12	.	Q	V	.	.	.	.
7.817	2.8171	5.13	.	Q	V	.	.	.	.
7.833	2.8242	5.14	.	Q	V	.	.	.	.
7.850	2.8313	5.14	.	Q	V	.	.	.	.
7.867	2.8384	5.15	.	Q	V	.	.	.	.
7.883	2.8455	5.15	.	Q	V	.	.	.	.
7.900	2.8526	5.16	.	Q	V	.	.	.	.
7.917	2.8597	5.17	.	Q	V	.	.	.	.
7.933	2.8668	5.17	.	Q	V	.	.	.	.
7.950	2.8740	5.18	.	Q	V	.	.	.	.
7.967	2.8811	5.18	.	Q	V	.	.	.	.

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7.983      2.8883      5.19  . Q     V .         .         .         .
8.000      2.8954      5.19  . Q     V .         .         .         .
8.017      2.9026      5.20  . Q     V .         .         .         .
8.033      2.9097      5.20  . Q     V .         .         .         .
8.050      2.9169      5.20  . Q     V .         .         .         .
8.067      2.9241      5.20  . Q     V .         .         .         .
8.083      2.9312      5.21  . Q     V .         .         .         .
8.100      2.9384      5.21  . Q     V .         .         .         .
8.117      2.9456      5.21  . Q     V .         .         .         .
8.133      2.9528      5.22  . Q     V .         .         .         .
8.150      2.9600      5.22  . Q     V .         .         .         .
8.167      2.9672      5.22  . Q     V .         .         .         .
8.183      2.9744      5.23  . Q     V .         .         .         .
8.200      2.9816      5.24  . Q     V .         .         .         .
8.217      2.9888      5.24  . Q     V .         .         .         .
8.233      2.9960      5.25  . Q     V .         .         .         .
8.250      3.0033      5.26  . Q     V .         .         .         .
8.267      3.0105      5.26  . Q     V .         .         .         .
8.283      3.0178      5.27  . Q     V .         .         .         .
8.300      3.0250      5.27  . Q     V .         .         .         .
8.317      3.0323      5.28  . Q     V .         .         .         .
8.333      3.0396      5.29  . Q     V .         .         .         .
8.350      3.0469      5.29  . Q     V .         .         .         .
8.367      3.0542      5.30  . Q     V .         .         .         .
8.383      3.0615      5.30  . Q     V .         .         .         .
8.400      3.0688      5.30  . Q     V .         .         .         .
8.417      3.0761      5.31  . Q     V .         .         .         .
8.433      3.0834      5.31  . Q     V .         .         .         .
8.450      3.0907      5.31  . Q     V .         .         .         .
8.467      3.0981      5.32  . Q     V .         .         .         .
8.483      3.1054      5.32  . Q     V .         .         .         .
8.500      3.1127      5.32  . Q      V.         .         .         .
8.517      3.1201      5.33  . Q      V.         .         .         .
8.533      3.1274      5.33  . Q      V.         .         .         .
8.550      3.1348      5.34  . Q      V.         .         .         .
8.567      3.1421      5.34  . Q      V.         .         .         .
8.583      3.1495      5.35  . Q      V.         .         .         .
8.600      3.1569      5.36  . Q      V.         .         .         .
8.617      3.1643      5.36  . Q      V.         .         .         .
8.633      3.1717      5.37  . Q      V.         .         .         .
8.650      3.1791      5.38  . Q      V.         .         .         .
8.667      3.1865      5.38  . Q      V.         .         .         .
8.683      3.1939      5.39  . Q      V.         .         .         .
8.700      3.2013      5.40  . Q      V.         .         .         .
8.717      3.2088      5.41  . Q      V.         .         .         .
8.733      3.2162      5.41  . Q      V.         .         .         .
8.750      3.2237      5.42  . Q      V.         .         .         .
8.767      3.2312      5.42  . Q      V.         .         .         .
8.783      3.2386      5.42  . Q      V.         .         .         .
8.800      3.2461      5.43  . Q      V.         .         .         .
8.817      3.2536      5.43  . Q      V.         .         .         .
8.833      3.2611      5.43  . Q      V.         .         .         .
8.850      3.2686      5.44  . Q      V.         .         .         .
8.867      3.2760      5.44  . Q      V.         .         .         .
8.883      3.2835      5.44  . Q      V.         .         .         .
8.900      3.2910      5.45  . Q      V.         .         .         .
8.917      3.2986      5.45  . Q      V.         .         .         .
8.933      3.3061      5.46  . Q      V.         .         .         .
8.950      3.3136      5.47  . Q      V.         .         .         .
8.967      3.3211      5.47  . Q      V.         .         .         .
8.983      3.3287      5.48  . Q      V.         .         .         .
9.000      3.3363      5.49  . Q      V.         .         .         .
9.017      3.3438      5.50  . Q      V.         .         .         .
9.033      3.3514      5.50  . Q      V.         .         .         .
9.050      3.3590      5.51  . Q      V.         .         .         .
9.067      3.3666      5.52  . Q      V.         .         .         .
9.083      3.3742      5.53  . Q      V.         .         .         .
9.100      3.3818      5.53  . Q      V.         .         .         .
9.117      3.3895      5.54  . Q      V.         .         .         .
9.133      3.3971      5.54  . Q      V.         .         .         .
9.150      3.4047      5.55  . Q      V.         .         .         .
9.167      3.4124      5.55  . Q      V.         .         .         .
9.183      3.4200      5.55  . Q      V.         .         .         .
9.200      3.4277      5.56  . Q      V.         .         .         .
9.217      3.4353      5.56  . Q      V.         .         .         .
9.233      3.4430      5.56  . Q      V.         .         .         .
9.250      3.4507      5.57  . Q      V.         .         .         .
9.267      3.4583      5.57  . Q       V         .         .         .
9.283      3.4660      5.58  . Q       V         .         .         .
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9.300	3.4737	5.58	.	Q	V	.	.	.
9.317	3.4814	5.59	.	Q	V	.	.	.
9.333	3.4891	5.60	.	Q	V	.	.	.
9.350	3.4968	5.61	.	Q	V	.	.	.
9.367	3.5046	5.61	.	Q	V	.	.	.
9.383	3.5123	5.62	.	Q	V	.	.	.
9.400	3.5201	5.63	.	Q	V	.	.	.
9.417	3.5278	5.64	.	Q	V	.	.	.
9.433	3.5356	5.65	.	Q	V	.	.	.
9.450	3.5434	5.65	.	Q	V	.	.	.
9.467	3.5512	5.66	.	Q	V	.	.	.
9.483	3.5590	5.67	.	Q	V	.	.	.
9.500	3.5668	5.67	.	Q	V	.	.	.
9.517	3.5747	5.68	.	Q	V	.	.	.
9.533	3.5825	5.68	.	Q	V	.	.	.
9.550	3.5903	5.69	.	Q	V	.	.	.
9.567	3.5982	5.69	.	Q	V	.	.	.
9.583	3.6060	5.69	.	Q	V	.	.	.
9.600	3.6138	5.70	.	Q	V	.	.	.
9.617	3.6217	5.70	.	Q	V	.	.	.
9.633	3.6296	5.71	.	Q	V	.	.	.
9.650	3.6374	5.71	.	Q	V	.	.	.
9.667	3.6453	5.72	.	Q	V	.	.	.
9.683	3.6532	5.72	.	Q	V	.	.	.
9.700	3.6611	5.73	.	Q	V	.	.	.
9.717	3.6690	5.74	.	Q	V	.	.	.
9.733	3.6769	5.75	.	Q	V	.	.	.
9.750	3.6848	5.76	.	Q	V	.	.	.
9.767	3.6928	5.77	.	Q	V	.	.	.
9.783	3.7007	5.78	.	Q	V	.	.	.
9.800	3.7087	5.79	.	Q	V	.	.	.
9.817	3.7167	5.79	.	Q	V	.	.	.
9.833	3.7247	5.80	.	Q	V	.	.	.
9.850	3.7327	5.81	.	Q	V	.	.	.
9.867	3.7407	5.82	.	Q	V	.	.	.
9.883	3.7487	5.82	.	Q	V	.	.	.
9.900	3.7568	5.83	.	Q	V	.	.	.
9.917	3.7648	5.83	.	Q	V	.	.	.
9.933	3.7728	5.83	.	Q	V	.	.	.
9.950	3.7809	5.84	.	Q	V	.	.	.
9.967	3.7889	5.84	.	Q	V	.	.	.
9.983	3.7970	5.85	.	Q	V	.	.	.
10.000	3.8050	5.85	.	Q	.V	.	.	.
10.017	3.8131	5.86	.	Q	.V	.	.	.
10.033	3.8212	5.86	.	Q	.V	.	.	.
10.050	3.8293	5.87	.	Q	.V	.	.	.
10.067	3.8374	5.88	.	Q	.V	.	.	.
10.083	3.8455	5.89	.	Q	.V	.	.	.
10.100	3.8536	5.90	.	Q	.V	.	.	.
10.117	3.8617	5.91	.	Q	.V	.	.	.
10.133	3.8699	5.92	.	Q	.V	.	.	.
10.150	3.8780	5.93	.	Q	.V	.	.	.
10.167	3.8862	5.94	.	Q	.V	.	.	.
10.183	3.8944	5.95	.	Q	.V	.	.	.
10.200	3.9026	5.96	.	Q	.V	.	.	.
10.217	3.9108	5.97	.	Q	.V	.	.	.
10.233	3.9191	5.97	.	Q	.V	.	.	.
10.250	3.9273	5.98	.	Q	.V	.	.	.
10.267	3.9355	5.98	.	Q	.V	.	.	.
10.283	3.9438	5.99	.	Q	.V	.	.	.
10.300	3.9520	5.99	.	Q	.V	.	.	.
10.317	3.9603	6.00	.	Q	.V	.	.	.
10.333	3.9686	6.00	.	Q	.V	.	.	.
10.350	3.9768	6.01	.	Q	.V	.	.	.
10.367	3.9851	6.01	.	Q	.V	.	.	.
10.383	3.9934	6.02	.	Q	.V	.	.	.
10.400	4.0017	6.02	.	Q	.V	.	.	.
10.417	4.0100	6.03	.	Q	.V	.	.	.
10.433	4.0183	6.04	.	Q	.V	.	.	.
10.450	4.0266	6.05	.	Q	.V	.	.	.
10.467	4.0350	6.06	.	Q	.V	.	.	.
10.483	4.0434	6.07	.	Q	.V	.	.	.
10.500	4.0517	6.08	.	Q	.V	.	.	.
10.517	4.0601	6.09	.	Q	.V	.	.	.
10.533	4.0685	6.10	.	Q	.V	.	.	.
10.550	4.0769	6.11	.	Q	.V	.	.	.
10.567	4.0854	6.12	.	Q	.V	.	.	.
10.583	4.0938	6.13	.	Q	.V	.	.	.
10.600	4.1023	6.14	.	Q	.V	.	.	.

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10.617      4.1108      6.15  . Q       .V        .         .         .
10.633      4.1192      6.15  . Q       .V        .         .         .
10.650      4.1277      6.16  . Q       .V        .         .         .
10.667      4.1362      6.16  . Q       .V        .         .         .
10.683      4.1447      6.17  . Q       .V        .         .         .
10.700      4.1532      6.17  . Q       . V       .         .         .
10.717      4.1617      6.18  . Q       . V       .         .         .
10.733      4.1702      6.19  . Q       . V       .         .         .
10.750      4.1788      6.19  . Q       . V       .         .         .
10.767      4.1873      6.20  . Q       . V       .         .         .
10.783      4.1958      6.20  . Q       . V       .         .         .
10.800      4.2044      6.21  . Q       . V       .         .         .
10.817      4.2130      6.23  . Q       . V       .         .         .
10.833      4.2216      6.24  . Q       . V       .         .         .
10.850      4.2302      6.25  . Q       . V       .         .         .
10.867      4.2388      6.26  . Q       . V       .         .         .
10.883      4.2474      6.27  . Q       . V       .         .         .
10.900      4.2561      6.28  . Q       . V       .         .         .
10.917      4.2648      6.29  . Q       . V       .         .         .
10.933      4.2735      6.31  . Q       . V       .         .         .
10.950      4.2822      6.32  . Q       . V       .         .         .
10.967      4.2909      6.33  . Q       . V       .         .         .
10.983      4.2996      6.34  . Q       . V       .         .         .
11.000      4.3083      6.34  . Q       . V       .         .         .
11.017      4.3171      6.35  . Q       . V       .         .         .
11.033      4.3258      6.35  . Q       . V       .         .         .
11.050      4.3346      6.36  . Q       . V       .         .         .
11.067      4.3434      6.37  . Q       . V       .         .         .
11.083      4.3521      6.37  . Q       . V       .         .         .
11.100      4.3609      6.38  . Q       . V       .         .         .
11.117      4.3697      6.38  .  Q      . V       .         .         .
11.133      4.3785      6.39  .  Q      . V       .         .         .
11.150      4.3873      6.40  .  Q      . V       .         .         .
11.167      4.3961      6.41  .  Q      . V       .         .         .
11.183      4.4050      6.42  .  Q      . V       .         .         .
11.200      4.4138      6.43  .  Q      . V       .         .         .
11.217      4.4227      6.44  .  Q      . V       .         .         .
11.233      4.4316      6.46  .  Q      . V       .         .         .
11.250      4.4405      6.47  .  Q      . V       .         .         .
11.267      4.4495      6.48  .  Q      . V       .         .         .
11.283      4.4584      6.50  .  Q      . V       .         .         .
11.300      4.4674      6.51  .  Q      . V       .         .         .
11.317      4.4764      6.52  .  Q      . V       .         .         .
11.333      4.4854      6.53  .  Q      . V       .         .         .
11.350      4.4944      6.54  .  Q      .  V      .         .         .
11.367      4.5034      6.55  .  Q      .  V      .         .         .
11.383      4.5124      6.56  .  Q      .  V      .         .         .
11.400      4.5215      6.56  .  Q      .  V      .         .         .
11.417      4.5305      6.57  .  Q      .  V      .         .         .
11.433      4.5396      6.58  .  Q      .  V      .         .         .
11.450      4.5486      6.58  .  Q      .  V      .         .         .
11.467      4.5577      6.59  .  Q      .  V      .         .         .
11.483      4.5668      6.60  .  Q      .  V      .         .         .
11.500      4.5759      6.60  .  Q      .  V      .         .         .
11.517      4.5850      6.61  .  Q      .  V      .         .         .
11.533      4.5941      6.62  .  Q      .  V      .         .         .
11.550      4.6033      6.63  .  Q      .  V      .         .         .
11.567      4.6124      6.65  .  Q      .  V      .         .         .
11.583      4.6216      6.66  .  Q      .  V      .         .         .
11.600      4.6308      6.68  .  Q      .  V      .         .         .
11.617      4.6400      6.69  .  Q      .  V      .         .         .
11.633      4.6493      6.71  .  Q      .  V      .         .         .
11.650      4.6585      6.72  .  Q      .  V      .         .         .
11.667      4.6678      6.73  .  Q      .  V      .         .         .
11.683      4.6771      6.75  .  Q      .  V      .         .         .
11.700      4.6864      6.76  .  Q      .  V      .         .         .
11.717      4.6957      6.78  .  Q      .  V      .         .         .
11.733      4.7051      6.78  .  Q      .  V      .         .         .
11.750      4.7144      6.79  .  Q      .  V      .         .         .
11.767      4.7238      6.80  .  Q      .  V      .         .         .
11.783      4.7332      6.81  .  Q      .  V      .         .         .
11.800      4.7426      6.81  .  Q      .  V      .         .         .
11.817      4.7519      6.82  .  Q      .  V      .         .         .
11.833      4.7614      6.83  .  Q      .  V      .         .         .
11.850      4.7708      6.84  .  Q      .  V      .         .         .
11.867      4.7802      6.84  .  Q      .  V      .         .         .
11.883      4.7896      6.85  .  Q      .  V      .         .         .
11.900      4.7991      6.86  .  Q      .  V      .         .         .
11.917      4.8086      6.88  .  Q      .  V      .         .         .
```

11.933	4.8181	6.90	.	Q	.	V	.	.	.
11.950	4.8276	6.92	.	Q	.	V	.	.	.
11.967	4.8371	6.94	.	Q	.	V	.	.	.
11.983	4.8467	6.96	.	Q	.	V	.	.	.
12.000	4.8563	6.98	.	Q	.	V	.	.	.
12.017	4.8660	6.99	.	Q	.	V	.	.	.
12.033	4.8756	7.01	.	Q	.	V	.	.	.
12.050	4.8853	7.03	.	Q	.	V	.	.	.
12.067	4.8950	7.05	.	Q	.	V	.	.	.
12.083	4.9048	7.07	.	Q	.	V	.	.	.
12.100	4.9146	7.10	.	Q	.	V	.	.	.
12.117	4.9244	7.13	.	Q	.	V	.	.	.
12.133	4.9342	7.15	.	Q	.	V	.	.	.
12.150	4.9441	7.18	.	Q	.	V	.	.	.
12.167	4.9541	7.21	.	Q	.	V	.	.	.
12.183	4.9640	7.24	.	Q	.	V	.	.	.
12.200	4.9740	7.27	.	Q	.	V	.	.	.
12.217	4.9841	7.30	.	Q	.	V	.	.	.
12.233	4.9942	7.32	.	Q	.	V	.	.	.
12.250	5.0043	7.35	.	Q	.	V	.	.	.
12.267	5.0145	7.38	.	Q	.	V	.	.	.
12.283	5.0247	7.40	.	Q	.	V	.	.	.
12.300	5.0349	7.42	.	Q	.	V	.	.	.
12.317	5.0451	7.44	.	Q	.	V	.	.	.
12.333	5.0554	7.46	.	Q	.	V	.	.	.
12.350	5.0657	7.48	.	Q	.	V	.	.	.
12.367	5.0760	7.50	.	Q	.	V	.	.	.
12.383	5.0864	7.51	.	Q	.	V	.	.	.
12.400	5.0968	7.53	.	Q	.	V	.	.	.
12.417	5.1072	7.55	.	Q	.	V	.	.	.
12.433	5.1176	7.57	.	Q	.	V	.	.	.
12.450	5.1280	7.59	.	Q	.	V	.	.	.
12.467	5.1385	7.60	.	Q	.	V	.	.	.
12.483	5.1490	7.61	.	Q	.	V	.	.	.
12.500	5.1595	7.62	.	Q	.	V	.	.	.
12.517	5.1700	7.63	.	Q	.	V	.	.	.
12.533	5.1805	7.64	.	Q	.	V	.	.	.
12.550	5.1911	7.65	.	Q	.	V	.	.	.
12.567	5.2016	7.66	.	Q	.	V	.	.	.
12.583	5.2122	7.67	.	Q	.	V	.	.	.
12.600	5.2228	7.68	.	Q	.	V	.	.	.
12.617	5.2334	7.69	.	Q	.	V	.	.	.
12.633	5.2440	7.70	.	Q	.	V	.	.	.
12.650	5.2546	7.71	.	Q	.	V	.	.	.
12.667	5.2652	7.73	.	Q	.	V	.	.	.
12.683	5.2759	7.75	.	Q	.	V	.	.	.
12.700	5.2866	7.77	.	Q	.	V	.	.	.
12.717	5.2974	7.80	.	Q	.	V	.	.	.
12.733	5.3081	7.82	.	Q	.	V	.	.	.
12.750	5.3189	7.84	.	Q	.	V	.	.	.
12.767	5.3297	7.86	.	Q	.	V	.	.	.
12.783	5.3406	7.88	.	Q	.	V	.	.	.
12.800	5.3515	7.90	.	Q	.	V	.	.	.
12.817	5.3624	7.92	.	Q	.	V	.	.	.
12.833	5.3733	7.94	.	Q	.	V	.	.	.
12.850	5.3843	7.96	.	Q	.	V	.	.	.
12.867	5.3953	7.97	.	Q	.	V	.	.	.
12.883	5.4063	7.98	.	Q	.	V	.	.	.
12.900	5.4173	7.99	.	Q	.	V	.	.	.
12.917	5.4283	8.00	.	Q	.	V	.	.	.
12.933	5.4393	8.01	.	Q	.	V	.	.	.
12.950	5.4504	8.02	.	Q	.	V	.	.	.
12.967	5.4614	8.04	.	Q	.	V	.	.	.
12.983	5.4725	8.05	.	Q	.	V	.	.	.
13.000	5.4836	8.06	.	Q	.	V	.	.	.
13.017	5.4947	8.07	.	Q	.	V	.	.	.
13.033	5.5059	8.09	.	Q	.	V	.	.	.
13.050	5.5171	8.12	.	Q	.	V	.	.	.
13.067	5.5283	8.14	.	Q	.	V	.	.	.
13.083	5.5395	8.17	.	Q	.	V	.	.	.
13.100	5.5508	8.19	.	Q	.	V	.	.	.
13.117	5.5621	8.21	.	Q	.	V	.	.	.
13.133	5.5735	8.24	.	Q	.	V	.	.	.
13.150	5.5849	8.26	.	Q	.	V	.	.	.
13.167	5.5963	8.29	.	Q	.	V	.	.	.
13.183	5.6077	8.31	.	Q	.	V	.	.	.
13.200	5.6192	8.34	.	Q	.	V	.	.	.
13.217	5.6307	8.36	.	Q	.	V	.	.	.
13.233	5.6423	8.37	.	Q	.	V	.	.	.

13.250	5.6538	8.39	.	Q	.	V	.	.	.
13.267	5.6654	8.40	.	Q	.	V	.	.	.
13.283	5.6770	8.41	.	Q	.	V	.	.	.
13.300	5.6886	8.43	.	Q	.	V	.	.	.
13.317	5.7002	8.44	.	Q	.	V	.	.	.
13.333	5.7118	8.45	.	Q	.	V	.	.	.
13.350	5.7235	8.47	.	Q	.	V	.	.	.
13.367	5.7352	8.48	.	Q	.	V	.	.	.
13.383	5.7469	8.49	.	Q	.	V	.	.	.
13.400	5.7586	8.51	.	Q	.	V	.	.	.
13.417	5.7704	8.54	.	Q	.	V	.	.	.
13.433	5.7822	8.57	.	Q	.	V	.	.	.
13.450	5.7940	8.60	.	Q	.	V	.	.	.
13.467	5.8059	8.63	.	Q	.	V	.	.	.
13.483	5.8179	8.66	.	Q	.	V	.	.	.
13.500	5.8298	8.69	.	Q	.	V	.	.	.
13.517	5.8418	8.72	.	Q	.	V	.	.	.
13.533	5.8539	8.75	.	Q	.	V	.	.	.
13.550	5.8660	8.78	.	Q	.	V	.	.	.
13.567	5.8781	8.81	.	Q	.	V	.	.	.
13.583	5.8903	8.84	.	Q	.	V	.	.	.
13.600	5.9025	8.86	.	Q	.	V	.	.	.
13.617	5.9147	8.87	.	Q	.	V	.	.	.
13.633	5.9270	8.89	.	Q	.	V	.	.	.
13.650	5.9392	8.91	.	Q	.	V	.	.	.
13.667	5.9515	8.92	.	Q	.	V	.	.	.
13.683	5.9638	8.94	.	Q	.	V	.	.	.
13.700	5.9762	8.96	.	Q	.	V	.	.	.
13.717	5.9885	8.97	.	Q	.	V	.	.	.
13.733	6.0009	8.99	.	Q	.	V	.	.	.
13.750	6.0133	9.01	.	Q	.	V	.	.	.
13.767	6.0258	9.02	.	Q	.	V	.	.	.
13.783	6.0382	9.06	.	Q	.	V	.	.	.
13.800	6.0508	9.09	.	Q	.	V	.	.	.
13.817	6.0633	9.13	.	Q	.	V	.	.	.
13.833	6.0760	9.17	.	Q	.	V	.	.	.
13.850	6.0887	9.21	.	Q	.	V	.	.	.
13.867	6.1014	9.24	.	Q	.	V	.	.	.
13.883	6.1142	9.28	.	Q	.	V	.	.	.
13.900	6.1270	9.32	.	Q	.	V	.	.	.
13.917	6.1399	9.35	.	Q	.	V	.	.	.
13.933	6.1528	9.39	.	Q	.	V	.	.	.
13.950	6.1658	9.43	.	Q	.	V	.	.	.
13.967	6.1788	9.45	.	Q	.	V	.	.	.
13.983	6.1919	9.46	.	Q	.	V	.	.	.
14.000	6.2049	9.48	.	Q	.	V	.	.	.
14.017	6.2180	9.49	.	Q	.	V	.	.	.
14.033	6.2311	9.51	.	Q	.	V	.	.	.
14.050	6.2442	9.52	.	Q	.	V	.	.	.
14.067	6.2573	9.54	.	Q	.	V	.	.	.
14.083	6.2705	9.55	.	Q	.	V	.	.	.
14.100	6.2837	9.57	.	Q	.	V	.	.	.
14.117	6.2969	9.58	.	Q	.	V	.	.	.
14.133	6.3101	9.60	.	Q	.	V	.	.	.
14.150	6.3233	9.59	.	Q	.	V	.	.	.
14.167	6.3365	9.56	.	Q	.	V	.	.	.
14.183	6.3496	9.53	.	Q	.	V	.	.	.
14.200	6.3627	9.50	.	Q	.	V	.	.	.
14.217	6.3757	9.47	.	Q	.	V	.	.	.
14.233	6.3887	9.44	.	Q	.	V	.	.	.
14.250	6.4017	9.41	.	Q	.	V	.	.	.
14.267	6.4146	9.38	.	Q	.	V	.	.	.
14.283	6.4274	9.34	.	Q	.	V	.	.	.
14.300	6.4403	9.31	.	Q	.	V	.	.	.
14.317	6.4531	9.28	.	Q	.	V	.	.	.
14.333	6.4658	9.27	.	Q	.	V	.	.	.
14.350	6.4786	9.30	.	Q	.	V	.	.	.
14.367	6.4915	9.33	.	Q	.	V	.	.	.
14.383	6.5044	9.36	.	Q	.	V	.	.	.
14.400	6.5173	9.38	.	Q	.	V	.	.	.
14.417	6.5303	9.41	.	Q	.	V	.	.	.
14.433	6.5433	9.44	.	Q	.	V	.	.	.
14.450	6.5563	9.47	.	Q	.	V	.	.	.
14.467	6.5694	9.50	.	Q	.	V	.	.	.
14.483	6.5825	9.53	.	Q	.	V	.	.	.
14.500	6.5957	9.55	.	Q	.	V	.	.	.
14.517	6.6089	9.59	.	Q	.	V	.	.	.
14.533	6.6222	9.65	.	Q	.	V	.	.	.
14.550	6.6356	9.72	.	Q	.	V	.	.	.

14.567	6.6491	9.79	.	Q	.	V.	.	.
14.583	6.6626	9.86	.	Q	.	V.	.	.
14.600	6.6763	9.92	.	Q	.	V.	.	.
14.617	6.6901	9.99	.	Q	.	V.	.	.
14.633	6.7039	10.06	.	Q	.	V.	.	.
14.650	6.7179	10.13	.	Q	.	V.	.	.
14.667	6.7319	10.19	.	Q	.	V.	.	.
14.683	6.7461	10.26	.	Q	.	V.	.	.
14.700	6.7603	10.33	.	Q	.	V.	.	.
14.717	6.7746	10.37	.	Q	.	V.	.	.
14.733	6.7889	10.41	.	Q	.	V.	.	.
14.750	6.8033	10.45	.	Q	.	V.	.	.
14.767	6.8178	10.49	.	Q	.	V.	.	.
14.783	6.8323	10.53	.	Q	.	V.	.	.
14.800	6.8468	10.57	.	Q	.	V.	.	.
14.817	6.8614	10.61	.	Q	.	V.	.	.
14.833	6.8761	10.65	.	Q	.	V.	.	.
14.850	6.8909	10.70	.	Q	.	V.	.	.
14.867	6.9056	10.74	.	Q	.	V.	.	.
14.883	6.9205	10.78	.	Q	.	V	.	.
14.900	6.9354	10.86	.	Q	.	V	.	.
14.917	6.9505	10.96	.	Q	.	V	.	.
14.933	6.9658	11.07	.	Q	.	V	.	.
14.950	6.9812	11.17	.	Q	.	V	.	.
14.967	6.9967	11.27	.	Q	.	V	.	.
14.983	7.0124	11.38	.	Q	.	V	.	.
15.000	7.0282	11.48	.	Q	.	V	.	.
15.017	7.0441	11.58	.	Q	.	V	.	.
15.033	7.0602	11.69	.	Q	.	V	.	.
15.050	7.0765	11.79	.	Q	.	V	.	.
15.067	7.0929	11.89	.	Q	.	V	.	.
15.083	7.1094	11.98	.	Q	.	V	.	.
15.100	7.1260	12.05	.	Q	.	V	.	.
15.117	7.1427	12.13	.	Q	.	V	.	.
15.133	7.1595	12.20	.	Q	.	V	.	.
15.150	7.1764	12.28	.	Q	.	V	.	.
15.167	7.1934	12.35	.	Q	.	V	.	.
15.183	7.2105	12.43	.	Q	.	V	.	.
15.200	7.2277	12.50	.	Q	.	V	.	.
15.217	7.2451	12.57	.	Q	.	V	.	.
15.233	7.2625	12.65	.	Q	.	.V	.	.
15.250	7.2800	12.72	.	Q	.	.V	.	.
15.267	7.2976	12.80	.	Q	.	.V	.	.
15.283	7.3154	12.89	.	Q	.	.V	.	.
15.300	7.3333	12.98	.	Q	.	.V	.	.
15.317	7.3513	13.07	.	Q	.	.V	.	.
15.333	7.3694	13.16	.	Q	.	.V	.	.
15.350	7.3876	13.25	.	Q	.	.V	.	.
15.367	7.4060	13.33	.	Q	.	.V	.	.
15.383	7.4245	13.42	.	Q	.	.V	.	.
15.400	7.4431	13.51	.	Q	.	.V	.	.
15.417	7.4618	13.60	.	Q	.	.V	.	.
15.433	7.4807	13.69	.	Q	.	.V	.	.
15.450	7.4996	13.75	.	Q	.	.V	.	.
15.467	7.5185	13.70	.	Q	.	.V	.	.
15.483	7.5373	13.64	.	Q	.	.V	.	.
15.500	7.5560	13.58	.	Q	.	.V	.	.
15.517	7.5746	13.52	.	Q	.	.V	.	.
15.533	7.5932	13.46	.	Q	.	.V	.	.
15.550	7.6117	13.40	.	Q	.	. V	.	.
15.567	7.6300	13.34	.	Q	.	. V	.	.
15.583	7.6483	13.28	.	Q	.	. V	.	.
15.600	7.6665	13.22	.	Q	.	. V	.	.
15.617	7.6847	13.16	.	Q	.	. V	.	.
15.633	7.7028	13.15	.	Q	.	. V	.	.
15.650	7.7215	13.56	.	Q	.	. V	.	.
15.667	7.7408	14.07	.	Q	.	. V	.	.
15.683	7.7609	14.59	.	Q	.	. V	.	.
15.700	7.7817	15.10	.	Q	.	. V	.	.
15.717	7.8033	15.62	.	Q	.	. V	.	.
15.733	7.8255	16.13	.	Q	.	. V	.	.
15.750	7.8484	16.65	.	Q	.	. V	.	.
15.767	7.8720	17.16	.	Q	.	. V	.	.
15.783	7.8964	17.67	.	Q	.	. V	.	.
15.800	7.9214	18.19	.	Q	.	. V	.	.
15.817	7.9472	18.71	.	Q	.	. V	.	.
15.833	7.9738	19.32	.	Q.		. V	.	.
15.850	8.0013	19.98	.	Q.		. V	.	.
15.867	8.0298	20.64	.	Q.		. V	.	.

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15.883     8.0591    21.31  .        Q        .  V      .        .
15.900     8.0894    21.97  .        Q        .  V      .        .
15.917     8.1206    22.63  .        Q        .  V      .        .
15.933     8.1526    23.29  .        Q        .  V      .        .
15.950     8.1856    23.95  .        .Q       .  V      .        .
15.967     8.2195    24.62  .        .Q       .  V      .        .
15.983     8.2544    25.28  .        .Q       .  V      .        .
16.000     8.2901    25.94  .        . Q      .  V      .        .
16.017     8.3299    28.90  .        .  Q     .   V     .        .
16.033     8.3769    34.15  .        .    Q   .   V     .        .
16.050     8.4312    39.40  .        .      Q .   V     .        .
16.067     8.4927    44.65  .        .        Q   V     .        .
16.083     8.5614    49.90  .        .         .  QV     .        .
16.100     8.6374    55.15  .        .         .    Q    .        .
16.117     8.7206    60.41  .        .         .    V  Q .        .
16.133     8.8111    65.66  .        .         .    V    Q        .
16.150     8.9087    70.91  .        .         .    V    .  Q     .
16.167     9.0136    76.16  .        .         .     V   .    Q   .
16.183     9.1258    81.41  .        .         .     V   .      Q .
16.200     9.2430    85.09  .        .         .     V   .       Q
16.217     9.3490    77.01  .        .         .      V  .    Q   .
16.233     9.4465    70.79  .        .         .      V  .  Q     .
16.250     9.5355    64.57  .        .         .      V  Q        .
16.267     9.6159    58.36  .        .         .      Q  .        .
16.283     9.6877    52.14  .        .         .   Q  V .        .
16.300     9.7509    45.92  .        .         .Q     V .        .
16.317     9.8056    39.71  .        .       Q .      V .        .
16.333     9.8518    33.49  .        .    Q    .      V .        .
16.350     9.8893    27.27  .        . Q       .      V .        .
16.367     9.9183    21.06  .        Q.        .      V .        .
16.383     9.9403    15.93  .      Q   .        .      V .        .
16.400     9.9613    15.30  .      Q   .        .      V .        .
16.417     9.9822    15.15  .      Q   .        .      V .        .
16.433    10.0029    15.00  .      Q   .        .      V .        .
16.450    10.0233    14.85  .    Q     .        .       V.        .
16.467    10.0436    14.70  .    Q     .        .       V.        .
16.483    10.0636    14.55  .    Q     .        .       V.        .
16.500    10.0834    14.40  .    Q     .        .       V.        .
16.517    10.1031    14.25  .    Q     .        .       V.        .
16.533    10.1225    14.10  .    Q     .        .       V.        .
16.550    10.1417    13.95  .    Q     .        .       V.        .
16.567    10.1607    13.80  .    Q     .        .       V.        .
16.583    10.1794    13.59  .    Q     .        .       V.        .
16.600    10.1979    13.37  .    Q     .        .       V.        .
16.617    10.2160    13.15  .    Q     .        .       V.        .
16.633    10.2338    12.93  .    Q     .        .       V.        .
16.650    10.2513    12.71  .   Q      .        .       V.        .
16.667    10.2685    12.48  .   Q      .        .       V.        .
16.683    10.2854    12.26  .   Q      .        .       V.        .
16.700    10.3020    12.04  .   Q      .        .       V.        .
16.717    10.3182    11.82  .   Q      .        .       V.        .
16.733    10.3342    11.60  .   Q      .        .       V.        .
16.750    10.3499    11.38  .   Q      .        .       V.        .
16.767    10.3654    11.23  .   Q      .        .        V        .
16.783    10.3806    11.10  .   Q      .        .        V        .
16.800    10.3958    10.98  .   Q      .        .        V        .
16.817    10.4107    10.86  .   Q      .        .        V        .
16.833    10.4255    10.73  .   Q      .        .        V        .
16.850    10.4401    10.61  .  Q       .        .        V        .
16.867    10.4546    10.49  .  Q       .        .        V        .
16.883    10.4688    10.37  .  Q       .        .        V        .
16.900    10.4830    10.24  .  Q       .        .        V        .
16.917    10.4969    10.12  .  Q       .        .        V        .
16.933    10.5107    10.00  .  Q       .        .        V        .
16.950    10.5243     9.89  .  Q       .        .        V        .
16.967    10.5378     9.81  .  Q       .        .        V        .
16.983    10.5512     9.72  .  Q       .        .        V        .
17.000    10.5645     9.64  .  Q       .        .        V        .
17.017    10.5776     9.55  .  Q       .        .        V        .
17.033    10.5906     9.46  .  Q       .        .        V        .
17.050    10.6036     9.38  .  Q       .        .        V        .
17.067    10.6164     9.29  .  Q       .        .        V        .
17.083    10.6290     9.21  .  Q       .        .        V        .
17.100    10.6416     9.12  .  Q       .        .        V        .
17.117    10.6541     9.04  .  Q       .        .        V        .
17.133    10.6664     8.98  .  Q       .        .        V        .
17.150    10.6788     9.00  .  Q       .        .        V        .
17.167    10.6913     9.03  .  Q       .        .        V        .
17.183    10.7037     9.05  .  Q       .        .        V        .
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17.200	10.7162	9.07	.	Q	.	.	.V	.
17.217	10.7287	9.09	.	Q	.	.	.V	.
17.233	10.7413	9.11	.	Q	.	.	.V	.
17.250	10.7539	9.14	.	Q	.	.	.V	.
17.267	10.7665	9.16	.	Q	.	.	.V	.
17.283	10.7792	9.18	.	Q	.	.	.V	.
17.300	10.7918	9.20	.	Q	.	.	.V	.
17.317	10.8045	9.21	.	Q	.	.	.V	.
17.333	10.8171	9.17	.	Q	.	.	.V	.
17.350	10.8297	9.12	.	Q	.	.	.V	.
17.367	10.8422	9.07	.	Q	.	.	.V	.
17.383	10.8546	9.02	.	Q	.	.	.V	.
17.400	10.8670	8.97	.	Q	.	.	.V	.
17.417	10.8793	8.92	.	Q	.	.	.V	.
17.433	10.8915	8.87	.	Q	.	.	.V	.
17.450	10.9036	8.82	.	Q	.	.	.V	.
17.467	10.9157	8.77	.	Q	.	.	.V	.
17.483	10.9277	8.72	.	Q	.	.	.V	.
17.500	10.9397	8.67	.	Q	.	.	.V	.
17.517	10.9516	8.63	.	Q	.	.	.V	.
17.533	10.9634	8.59	.	Q	.	.	.V	.
17.550	10.9752	8.55	.	Q	.	.	.V	.
17.567	10.9869	8.51	.	Q	.	.	.V	.
17.583	10.9985	8.47	.	Q	.	.	.V	.
17.600	11.0101	8.42	.	Q	.	.	.V	.
17.617	11.0217	8.38	.	Q	.	.	.V	.
17.633	11.0332	8.34	.	Q	.	.	.V	.
17.650	11.0446	8.30	.	Q	.	.	.V	.
17.667	11.0560	8.26	.	Q	.	.	. V	.
17.683	11.0673	8.22	.	Q	.	.	. V	.
17.700	11.0786	8.18	.	Q	.	.	. V	.
17.717	11.0898	8.15	.	Q	.	.	. V	.
17.733	11.1010	8.12	.	Q	.	.	. V	.
17.750	11.1121	8.08	.	Q	.	.	. V	.
17.767	11.1232	8.05	.	Q	.	.	. V	.
17.783	11.1342	8.01	.	Q	.	.	. V	.
17.800	11.1452	7.98	.	Q	.	.	. V	.
17.817	11.1562	7.94	.	Q	.	.	. V	.
17.833	11.1671	7.91	.	Q	.	.	. V	.
17.850	11.1779	7.88	.	Q	.	.	. V	.
17.867	11.1887	7.84	.	Q	.	.	. V	.
17.883	11.1995	7.81	.	Q	.	.	. V	.
17.900	11.2102	7.78	.	Q	.	.	. V	.
17.917	11.2209	7.75	.	Q	.	.	. V	.
17.933	11.2315	7.72	.	Q	.	.	. V	.
17.950	11.2421	7.69	.	Q	.	.	. V	.
17.967	11.2527	7.66	.	Q	.	.	. V	.
17.983	11.2632	7.63	.	Q	.	.	. V	.
18.000	11.2736	7.60	.	Q	.	.	. V	.
18.017	11.2841	7.57	.	Q	.	.	. V	.
18.033	11.2945	7.55	.	Q	.	.	. V	.
18.050	11.3048	7.52	.	Q	.	.	. V	.
18.067	11.3151	7.48	.	Q	.	.	. V	.
18.083	11.3254	7.43	.	Q	.	.	. V	.
18.100	11.3355	7.38	.	Q	.	.	. V	.
18.117	11.3456	7.33	.	Q	.	.	. V	.
18.133	11.3557	7.29	.	Q	.	.	. V	.
18.150	11.3656	7.24	.	Q	.	.	. V	.
18.167	11.3755	7.19	.	Q	.	.	. V	.
18.183	11.3854	7.14	.	Q	.	.	. V	.
18.200	11.3951	7.09	.	Q	.	.	. V	.
18.217	11.4048	7.04	.	Q	.	.	. V	.
18.233	11.4145	6.99	.	Q	.	.	. V	.
18.250	11.4240	6.95	.	Q	.	.	. V	.
18.267	11.4336	6.92	.	Q	.	.	. V	.
18.283	11.4431	6.90	.	Q	.	.	. V	.
18.300	11.4526	6.88	.	Q	.	.	. V	.
18.317	11.4620	6.86	.	Q	.	.	. V	.
18.333	11.4714	6.83	.	Q	.	.	. V	.
18.350	11.4808	6.81	.	Q	.	.	. V	.
18.367	11.4901	6.79	.	Q	.	.	. V	.
18.383	11.4995	6.76	.	Q	.	.	. V	.
18.400	11.5087	6.74	.	Q	.	.	. V	.
18.417	11.5180	6.72	.	Q	.	.	. V	.
18.433	11.5272	6.70	.	Q	.	.	. V	.
18.450	11.5364	6.68	.	Q	.	.	. V	.
18.467	11.5456	6.66	.	Q	.	.	. V	.
18.483	11.5547	6.64	.	Q	.	.	. V	.
18.500	11.5638	6.62	.	Q	.	.	. V	.

18.517	11.5729	6.60	.	Q	.	.	.	V	.	
18.533	11.5820	6.57	.	Q	.	.	.	V	.	
18.550	11.5910	6.55	.	Q	.	.	.	V	.	
18.567	11.6000	6.53	.	Q	.	.	.	V	.	
18.583	11.6090	6.51	.	Q	.	.	.	V	.	
18.600	11.6179	6.49	.	Q	.	.	.	V	.	
18.617	11.6268	6.47	.	Q	.	.	.	V	.	
18.633	11.6357	6.45	.	Q	.	.	.	V	.	
18.650	11.6446	6.44	.	Q	.	.	.	V	.	
18.667	11.6534	6.42	.	Q	.	.	.	V	.	
18.683	11.6623	6.40	.	Q	.	.	.	V	.	
18.700	11.6710	6.38	.	Q	.	.	.	V	.	
18.717	11.6798	6.36	.	Q	.	.	.	V	.	
18.733	11.6886	6.35	.	Q	.	.	.	V	.	
18.750	11.6973	6.33	.	Q	.	.	.	V	.	
18.767	11.7060	6.31	.	Q	.	.	.	V	.	
18.783	11.7146	6.29	.	Q	.	.	.	V	.	
18.800	11.7233	6.27	.	Q	.	.	.	V	.	
18.817	11.7319	6.26	.	Q	.	.	.	V	.	
18.833	11.7405	6.24	.	Q	.	.	.	V	.	
18.850	11.7491	6.22	.	Q	.	.	.	V	.	
18.867	11.7576	6.21	.	Q	.	.	.	V	.	
18.883	11.7661	6.19	.	Q	.	.	.	V	.	
18.900	11.7746	6.17	.	Q	.	.	.	V	.	
18.917	11.7831	6.16	.	Q	.	.	.	V	.	
18.933	11.7916	6.14	.	Q	.	.	.	V	.	
18.950	11.8000	6.13	.	Q	.	.	.	V	.	
18.967	11.8084	6.11	.	Q	.	.	.	V	.	
18.983	11.8168	6.09	.	Q	.	.	.	V	.	
19.000	11.8252	6.08	.	Q	.	.	.	V	.	
19.017	11.8335	6.06	.	Q	.	.	.	V	.	
19.033	11.8419	6.05	.	Q	.	.	.	V	.	
19.050	11.8502	6.03	.	Q	.	.	.	V	.	
19.067	11.8585	6.02	.	Q	.	.	.	V	.	
19.083	11.8667	6.00	.	Q	.	.	.	V	.	
19.100	11.8750	5.99	.	Q	.	.	.	V	.	
19.117	11.8832	5.97	.	Q	.	.	.	V	.	
19.133	11.8914	5.96	.	Q	.	.	.	V	.	
19.150	11.8996	5.94	.	Q	.	.	.	V	.	
19.167	11.9078	5.93	.	Q	.	.	.	V	.	
19.183	11.9159	5.91	.	Q	.	.	.	V	.	
19.200	11.9240	5.90	.	Q	.	.	.	V	.	
19.217	11.9321	5.89	.	Q	.	.	.	V	.	
19.233	11.9402	5.87	.	Q	.	.	.	V	.	
19.250	11.9483	5.86	.	Q	.	.	.	V	.	
19.267	11.9564	5.84	.	Q	.	.	.	V	.	
19.283	11.9644	5.83	.	Q	.	.	.	V	.	
19.300	11.9724	5.82	.	Q	.	.	.	V	.	
19.317	11.9804	5.80	.	Q	.	.	.	V	.	
19.333	11.9884	5.79	.	Q	.	.	.	V	.	
19.350	11.9963	5.78	.	Q	.	.	.	V	.	
19.367	12.0043	5.76	.	Q	.	.	.	V	.	
19.383	12.0122	5.75	.	Q	.	.	.	V	.	
19.400	12.0201	5.74	.	Q	.	.	.	V	.	
19.417	12.0280	5.73	.	Q	.	.	.	V	.	
19.433	12.0358	5.71	.	Q	.	.	.	V	.	
19.450	12.0437	5.70	.	Q	.	.	.	V	.	
19.467	12.0515	5.69	.	Q	.	.	.	V	.	
19.483	12.0594	5.68	.	Q	.	.	.	V	.	
19.500	12.0672	5.66	.	Q	.	.	.	V	.	
19.517	12.0749	5.65	.	Q	.	.	.	V	.	
19.533	12.0827	5.64	.	Q	.	.	.	V	.	
19.550	12.0904	5.63	.	Q	.	.	.	V	.	
19.567	12.0982	5.61	.	Q	.	.	.	V	.	
19.583	12.1059	5.60	.	Q	.	.	.	V	.	
19.600	12.1136	5.59	.	Q	.	.	.	V	.	
19.617	12.1213	5.58	.	Q	.	.	.	V	.	
19.633	12.1289	5.57	.	Q	.	.	.	V	.	
19.650	12.1366	5.56	.	Q	.	.	.	V	.	
19.667	12.1442	5.54	.	Q	.	.	.	V	.	
19.683	12.1519	5.53	.	Q	.	.	.	V	.	
19.700	12.1595	5.52	.	Q	.	.	.	V	.	
19.717	12.1670	5.51	.	Q	.	.	.	V	.	
19.733	12.1746	5.50	.	Q	.	.	.	V	.	
19.750	12.1822	5.49	.	Q	.	.	.	V	.	
19.767	12.1897	5.48	.	Q	.	.	.	V	.	
19.783	12.1972	5.46	.	Q	.	.	.	V	.	
19.800	12.2048	5.45	.	Q	.	.	.	V	.	
19.817	12.2123	5.44	.	Q	.	.	.	V	.	

19.833	12.2197	5.43	.	Q	.	.	.	V	.
19.850	12.2272	5.42	.	Q	.	.	.	V	.
19.867	12.2347	5.41	.	Q	.	.	.	V	.
19.883	12.2421	5.40	.	Q	.	.	.	V	.
19.900	12.2495	5.39	.	Q	.	.	.	V	.
19.917	12.2569	5.38	.	Q	.	.	.	V	.
19.933	12.2643	5.37	.	Q	.	.	.	V	.
19.950	12.2717	5.36	.	Q	.	.	.	V	.
19.967	12.2791	5.35	.	Q	.	.	.	V	.
19.983	12.2864	5.34	.	Q	.	.	.	V	.
20.000	12.2938	5.33	.	Q	.	.	.	V	.
20.017	12.3011	5.32	.	Q	.	.	.	V	.
20.033	12.3084	5.31	.	Q	.	.	.	V	.
20.050	12.3157	5.30	.	Q	.	.	.	V	.
20.067	12.3230	5.29	.	Q	.	.	.	V	.
20.083	12.3303	5.28	.	Q	.	.	.	V	.
20.100	12.3375	5.27	.	Q	.	.	.	V	.
20.117	12.3448	5.26	.	Q	.	.	.	V	.
20.133	12.3520	5.25	.	Q	.	.	.	V	.
20.150	12.3592	5.24	.	Q	.	.	.	V	.
20.167	12.3664	5.23	.	Q	.	.	.	V	.
20.183	12.3736	5.22	.	Q	.	.	.	V	.
20.200	12.3808	5.21	.	Q	.	.	.	V	.
20.217	12.3879	5.20	.	Q	.	.	.	V	.
20.233	12.3951	5.19	.	Q	.	.	.	V	.
20.250	12.4022	5.18	.	Q	.	.	.	V	.
20.267	12.4094	5.17	.	Q	.	.	.	V	.
20.283	12.4165	5.16	.	Q	.	.	.	V	.
20.300	12.4236	5.16	.	Q	.	.	.	V	.
20.317	12.4307	5.15	.	Q	.	.	.	V	.
20.333	12.4377	5.14	.	Q	.	.	.	V	.
20.350	12.4448	5.13	.	Q	.	.	.	V	.
20.367	12.4519	5.12	.	Q	.	.	.	V	.
20.383	12.4589	5.11	.	Q	.	.	.	V	.
20.400	12.4659	5.10	.	Q	.	.	.	V	.
20.417	12.4730	5.09	.	Q	.	.	.	V	.
20.433	12.4800	5.09	.	Q	.	.	.	V	.
20.450	12.4869	5.08	.	Q	.	.	.	V	.
20.467	12.4939	5.07	.	Q	.	.	.	V	.
20.483	12.5009	5.06	.	Q	.	.	.	V	.
20.500	12.5079	5.05	.	Q	.	.	.	V	.
20.517	12.5148	5.04	.	Q	.	.	.	V	.
20.533	12.5217	5.03	.	Q	.	.	.	V	.
20.550	12.5287	5.03	.	Q	.	.	.	V	.
20.567	12.5356	5.02	.	Q	.	.	.	V	.
20.583	12.5425	5.01	.	Q	.	.	.	V	.
20.600	12.5494	5.00	.	Q	.	.	.	V	.
20.617	12.5562	4.99	.	Q	.	.	.	V	.
20.633	12.5631	4.98	.	Q	.	.	.	V	.
20.650	12.5700	4.98	.	Q	.	.	.	V	.
20.667	12.5768	4.97	.	Q	.	.	.	V	.
20.683	12.5836	4.96	.	Q	.	.	.	V	.
20.700	12.5905	4.95	.	Q	.	.	.	V	.
20.717	12.5973	4.94	.	Q	.	.	.	V	.
20.733	12.6041	4.94	.	Q	.	.	.	V	.
20.750	12.6109	4.93	.	Q	.	.	.	V	.
20.767	12.6176	4.92	.	Q	.	.	.	V	.
20.783	12.6244	4.91	.	Q	.	.	.	V	.
20.800	12.6312	4.91	.	Q	.	.	.	V	.
20.817	12.6379	4.90	.	Q	.	.	.	V	.
20.833	12.6446	4.89	.	Q	.	.	.	V	.
20.850	12.6514	4.88	.	Q	.	.	.	V	.
20.867	12.6581	4.88	.	Q	.	.	.	V	.
20.883	12.6648	4.87	.	Q	.	.	.	V	.
20.900	12.6715	4.86	.	Q	.	.	.	V	.
20.917	12.6782	4.85	.	Q	.	.	.	V	.
20.933	12.6848	4.85	.	Q	.	.	.	V	.
20.950	12.6915	4.84	.	Q	.	.	.	V	.
20.967	12.6982	4.83	.	Q	.	.	.	V	.
20.983	12.7048	4.82	.	Q	.	.	.	V	.
21.000	12.7114	4.82	.	Q	.	.	.	V	.
21.017	12.7181	4.81	.	Q	.	.	.	V	.
21.033	12.7247	4.80	.	Q	.	.	.	V	.
21.050	12.7313	4.79	.	Q	.	.	.	V	.
21.067	12.7379	4.79	.	Q	.	.	.	V	.
21.083	12.7445	4.78	.	Q	.	.	.	V	.
21.100	12.7510	4.77	.	Q	.	.	.	V	.
21.117	12.7576	4.77	.	Q	.	.	.	V	.
21.133	12.7642	4.76	.	Q	.	.	.	V	.

21.150	12.7707	4.75	.	Q	.	.	.	V	.
21.167	12.7772	4.75	.	Q	.	.	.	V	.
21.183	12.7838	4.74	.	Q	.	.	.	V	.
21.200	12.7903	4.73	.	Q	.	.	.	V	.
21.217	12.7968	4.73	.	Q	.	.	.	V	.
21.233	12.8033	4.72	.	Q	.	.	.	V	.
21.250	12.8098	4.71	.	Q	.	.	.	V	.
21.267	12.8163	4.70	.	Q	.	.	.	V	.
21.283	12.8227	4.70	.	Q	.	.	.	V	.
21.300	12.8292	4.69	.	Q	.	.	.	V	.
21.317	12.8357	4.69	.	Q	.	.	.	V	.
21.333	12.8421	4.68	.	Q	.	.	.	V	.
21.350	12.8485	4.67	.	Q	.	.	.	V	.
21.367	12.8550	4.67	.	Q	.	.	.	V	.
21.383	12.8614	4.66	.	Q	.	.	.	V	.
21.400	12.8678	4.65	.	Q	.	.	.	V	.
21.417	12.8742	4.65	.	Q	.	.	.	V	.
21.433	12.8806	4.64	.	Q	.	.	.	V	.
21.450	12.8870	4.63	.	Q	.	.	.	V	.
21.467	12.8933	4.63	.	Q	.	.	.	V	.
21.483	12.8997	4.62	.	Q	.	.	.	V	.
21.500	12.9060	4.61	.	Q	.	.	.	V	.
21.517	12.9124	4.61	.	Q	.	.	.	V	.
21.533	12.9187	4.60	.	Q	.	.	.	V	.
21.550	12.9251	4.60	.	Q	.	.	.	V	.
21.567	12.9314	4.59	.	Q	.	.	.	V	.
21.583	12.9377	4.58	.	Q	.	.	.	V	.
21.600	12.9440	4.58	.	Q	.	.	.	V	.
21.617	12.9503	4.57	.	Q	.	.	.	V	.
21.633	12.9566	4.56	.	Q	.	.	.	V	.
21.650	12.9629	4.56	.	Q	.	.	.	V	.
21.667	12.9691	4.55	.	Q	.	.	.	V	.
21.683	12.9754	4.55	.	Q	.	.	.	V	.
21.700	12.9817	4.54	.	Q	.	.	.	V	.
21.717	12.9879	4.54	.	Q	.	.	.	V	.
21.733	12.9941	4.53	.	Q	.	.	.	V	.
21.750	13.0004	4.52	.	Q	.	.	.	V	.
21.767	13.0066	4.52	.	Q	.	.	.	V	.
21.783	13.0128	4.51	.	Q	.	.	.	V	.
21.800	13.0190	4.51	.	Q	.	.	.	V	.
21.817	13.0252	4.50	.	Q	.	.	.	V	.
21.833	13.0314	4.49	.	Q	.	.	.	V	.
21.850	13.0376	4.49	.	Q	.	.	.	V	.
21.867	13.0438	4.48	.	Q	.	.	.	V	.
21.883	13.0499	4.48	.	Q	.	.	.	V	.
21.900	13.0561	4.47	.	Q	.	.	.	V	.
21.917	13.0622	4.47	.	Q	.	.	.	V	.
21.933	13.0684	4.46	.	Q	.	.	.	V	.
21.950	13.0745	4.45	.	Q	.	.	.	V	.
21.967	13.0806	4.45	.	Q	.	.	.	V	.
21.983	13.0868	4.44	.	Q	.	.	.	V	.
22.000	13.0929	4.44	.	Q	.	.	.	V	.
22.017	13.0990	4.43	.	Q	.	.	.	V	.
22.033	13.1051	4.43	.	Q	.	.	.	V	.
22.050	13.1112	4.42	.	Q	.	.	.	V	.
22.067	13.1172	4.42	.	Q	.	.	.	V	.
22.083	13.1233	4.41	.	Q	.	.	.	V	.
22.100	13.1294	4.41	.	Q	.	.	.	V	.
22.117	13.1354	4.40	.	Q	.	.	.	V	.
22.133	13.1415	4.39	.	Q	.	.	.	V	.
22.150	13.1475	4.39	.	Q	.	.	.	V	.
22.167	13.1536	4.38	.	Q	.	.	.	V	.
22.183	13.1596	4.38	.	Q	.	.	.	V	.
22.200	13.1656	4.37	.	Q	.	.	.	V	.
22.217	13.1717	4.37	.	Q	.	.	.	V	.
22.233	13.1777	4.36	.	Q	.	.	.	V	.
22.250	13.1837	4.36	.	Q	.	.	.	V	.
22.267	13.1897	4.35	.	Q	.	.	.	V	.
22.283	13.1956	4.35	.	Q	.	.	.	V	.
22.300	13.2016	4.34	.	Q	.	.	.	V	.
22.317	13.2076	4.34	.	Q	.	.	.	V	.
22.333	13.2136	4.33	.	Q	.	.	.	V	.
22.350	13.2195	4.33	.	Q	.	.	.	V	.
22.367	13.2255	4.32	.	Q	.	.	.	V	.
22.383	13.2314	4.32	.	Q	.	.	.	V	.
22.400	13.2374	4.31	.	Q	.	.	.	V	.
22.417	13.2433	4.31	.	Q	.	.	.	V	.
22.433	13.2492	4.30	.	Q	.	.	.	V	.
22.450	13.2551	4.30	.	Q	.	.	.	V	.

22.467	13.2610	4.29	. Q	.	.	.	V .
22.483	13.2670	4.29	. Q	.	.	.	V .
22.500	13.2729	4.28	. Q	.	.	.	V .
22.517	13.2787	4.28	. Q	.	.	.	V .
22.533	13.2846	4.27	. Q	.	.	.	V .
22.550	13.2905	4.27	. Q	.	.	.	V .
22.567	13.2964	4.26	. Q	.	.	.	V .
22.583	13.3022	4.26	. Q	.	.	.	V .
22.600	13.3081	4.25	.Q	.	.	.	V .
22.617	13.3139	4.25	.Q	.	.	.	V .
22.633	13.3198	4.24	.Q	.	.	.	V .
22.650	13.3256	4.24	.Q	.	.	.	V .
22.667	13.3315	4.23	.Q	.	.	.	V .
22.683	13.3373	4.23	.Q	.	.	.	V .
22.700	13.3431	4.22	.Q	.	.	.	V .
22.717	13.3489	4.22	.Q	.	.	.	V .
22.733	13.3547	4.21	.Q	.	.	.	V .
22.750	13.3605	4.21	.Q	.	.	.	V .
22.767	13.3663	4.21	.Q	.	.	.	V .
22.783	13.3721	4.20	.Q	.	.	.	V .
22.800	13.3779	4.20	.Q	.	.	.	V .
22.817	13.3836	4.19	.Q	.	.	.	V .
22.833	13.3894	4.19	.Q	.	.	.	V .
22.850	13.3952	4.18	.Q	.	.	.	V .
22.867	13.4009	4.18	.Q	.	.	.	V .
22.883	13.4067	4.17	.Q	.	.	.	V .
22.900	13.4124	4.17	.Q	.	.	.	V .
22.917	13.4182	4.16	.Q	.	.	.	V .
22.933	13.4239	4.16	.Q	.	.	.	V .
22.950	13.4296	4.16	.Q	.	.	.	V .
22.967	13.4353	4.15	.Q	.	.	.	V .
22.983	13.4410	4.15	.Q	.	.	.	V .
23.000	13.4467	4.14	.Q	.	.	.	V .
23.017	13.4524	4.14	.Q	.	.	.	V .
23.033	13.4581	4.13	.Q	.	.	.	V .
23.050	13.4638	4.13	.Q	.	.	.	V .
23.067	13.4695	4.12	.Q	.	.	.	V .
23.083	13.4752	4.12	.Q	.	.	.	V.
23.100	13.4808	4.12	.Q	.	.	.	V.
23.117	13.4865	4.11	.Q	.	.	.	V.
23.133	13.4922	4.11	.Q	.	.	.	V.
23.150	13.4978	4.10	.Q	.	.	.	V.
23.167	13.5035	4.10	.Q	.	.	.	V.
23.183	13.5091	4.09	.Q	.	.	.	V.
23.200	13.5147	4.09	.Q	.	.	.	V.
23.217	13.5204	4.09	.Q	.	.	.	V.
23.233	13.5260	4.08	.Q	.	.	.	V.
23.250	13.5316	4.08	.Q	.	.	.	V.
23.267	13.5372	4.07	.Q	.	.	.	V.
23.283	13.5428	4.07	.Q	.	.	.	V.
23.300	13.5484	4.07	.Q	.	.	.	V.
23.317	13.5540	4.06	.Q	.	.	.	V.
23.333	13.5596	4.06	.Q	.	.	.	V.
23.350	13.5652	4.05	.Q	.	.	.	V.
23.367	13.5708	4.05	.Q	.	.	.	V.
23.383	13.5763	4.04	.Q	.	.	.	V.
23.400	13.5819	4.04	.Q	.	.	.	V.
23.417	13.5875	4.04	.Q	.	.	.	V.
23.433	13.5930	4.03	.Q	.	.	.	V.
23.450	13.5986	4.03	.Q	.	.	.	V.
23.467	13.6041	4.02	.Q	.	.	.	V.
23.483	13.6096	4.02	.Q	.	.	.	V.
23.500	13.6152	4.02	.Q	.	.	.	V.
23.517	13.6207	4.01	.Q	.	.	.	V.
23.533	13.6262	4.01	.Q	.	.	.	V.
23.550	13.6317	4.00	.Q	.	.	.	V.
23.567	13.6373	4.00	.Q	.	.	.	V.
23.583	13.6428	4.00	.Q	.	.	.	V.
23.600	13.6483	3.99	.Q	.	.	.	V.
23.617	13.6538	3.99	.Q	.	.	.	V.
23.633	13.6592	3.99	.Q	.	.	.	V.
23.650	13.6647	3.98	.Q	.	.	.	V.
23.667	13.6702	3.98	.Q	.	.	.	V.
23.683	13.6757	3.97	.Q	.	.	.	V.
23.700	13.6811	3.97	.Q	.	.	.	V.
23.717	13.6866	3.97	.Q	.	.	.	V.
23.733	13.6921	3.96	.Q	.	.	.	V.
23.750	13.6975	3.96	.Q	.	.	.	V.
23.767	13.7030	3.95	.Q	.	.	.	V.

```
   23.783     13.7084      3.95  .Q        .         .         .        V.
   23.800     13.7138      3.95  .Q        .         .         .        V.
   23.817     13.7193      3.94  .Q        .         .         .        V.
   23.833     13.7247      3.94  .Q        .         .         .        V.
   23.850     13.7301      3.94  .Q        .         .         .        V.
   23.867     13.7355      3.93  .Q        .         .         .        V.
   23.883     13.7410      3.93  .Q        .         .         .        V.
   23.900     13.7464      3.92  .Q        .         .         .        V.
   23.917     13.7518      3.92  .Q        .         .         .        V.
   23.933     13.7572      3.92  .Q        .         .         .        V.
   23.950     13.7625      3.91  .Q        .         .         .        V.
   23.967     13.7679      3.91  .Q        .         .         .        V.
   23.983     13.7733      3.91  .Q        .         .         .        V.
   24.000     13.7787      3.90  .Q        .         .         .        V.
   24.017     13.7841      3.90  .Q        .         .         .        V.
   24.033     13.7894      3.87  .Q        .         .         .        V.
   24.050     13.7943      3.58  .Q        .         .         .        V.
   24.067     13.7988      3.23  .Q        .         .         .        V.
   24.083     13.8028      2.89  .Q        .         .         .        V.
   24.100     13.8063      2.54  .Q        .         .         .        V.
   24.117     13.8093      2.19  .Q        .         .         .        V.
   24.133     13.8118      1.84  Q         .         .         .        V.
   24.150     13.8139      1.50  Q         .         .         .        V.
   24.167     13.8155      1.15  Q         .         .         .        V.
   24.183     13.8166      0.80  Q         .         .         .        V.
   24.200     13.8172      0.45  Q         .         .         .        V.
--------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated               Duration
        Peak Flow Rate                    (minutes)
    ======================               =========
               0%                         1452.0
              10%                         1250.0
              20%                          185.0
              30%                          110.0
              40%                           90.0
              50%                           75.0
              60%                           60.0
              70%                           45.0
              80%                           30.0
              90%                           15.0


********************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    153.00 IS CODE = 3.2
--------------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
================================================================================

                    INFLOW
                   (STREAM 1)
                        |
                        |
                        V                __effective depth
                    -----------          |   (and volume)
                   |           |    |    |
                   |           |    |....V........
                   | detention |<-->|           outflow
                   |   basin   |    |.........._______
                    -----------     |    ^    |  \
                        |           |  dead   |   basin outlet
                        V           | storage |
                     OUTFLOW         ---------
                   (STREAM 1)



          ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
          THROUGH A FLOW-THROUGH DETENTION BASIN
          SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
            DEAD STORAGE(AF) =      0.000
            SPECIFIED DEAD STORAGE(AF) FILLED =      0.000
            SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET =      0.000
            DETENTION BASIN CONSTANT LOSS RATE(CFS) =    0.00
```

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	0.10	43.45	0.001
3	0.20	43.71	0.022
4	0.30	43.97	0.085
5	0.40	44.23	0.195
6	0.50	44.49	0.352
7	0.60	44.74	0.550
8	0.70	45.00	0.774

==========

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(1-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.017	0.000	0.24	0.00	0.00	0.2	0.000
0.033	0.000	0.73	0.00	0.00	0.7	0.000
0.050	0.000	1.21	0.00	0.00	1.2	0.000
0.067	0.000	1.69	0.00	0.00	1.7	0.000
0.083	0.000	2.18	0.00	0.01	2.2	0.000
0.100	0.000	2.66	0.00	0.01	2.7	0.000
0.117	0.000	3.15	0.00	0.01	3.1	0.000
0.133	0.000	3.63	0.00	0.01	3.6	0.000
0.150	0.000	3.87	0.00	0.01	3.9	0.000
0.167	0.000	3.87	0.00	0.01	3.9	0.000
0.183	0.000	3.87	0.00	0.01	3.9	0.000
0.200	0.000	3.87	0.00	0.01	3.9	0.000
0.217	0.000	3.88	0.00	0.01	3.9	0.000
0.233	0.000	3.88	0.00	0.01	3.9	0.000
0.250	0.000	3.88	0.00	0.01	3.9	0.000
0.267	0.000	3.88	0.00	0.01	3.9	0.000
0.283	0.000	3.88	0.00	0.01	3.9	0.000
0.300	0.000	3.88	0.00	0.01	3.9	0.000
0.317	0.000	3.88	0.00	0.01	3.9	0.000
0.333	0.000	3.88	0.00	0.01	3.9	0.000
0.350	0.000	3.88	0.00	0.01	3.9	0.000
0.367	0.000	3.89	0.00	0.01	3.9	0.000
0.383	0.000	3.89	0.00	0.01	3.9	0.000
0.400	0.000	3.89	0.00	0.01	3.9	0.000
0.417	0.000	3.89	0.00	0.01	3.9	0.000
0.433	0.000	3.90	0.00	0.01	3.9	0.000
0.450	0.000	3.90	0.00	0.01	3.9	0.000
0.467	0.000	3.90	0.00	0.01	3.9	0.000
0.483	0.000	3.90	0.00	0.01	3.9	0.000
0.500	0.000	3.91	0.00	0.01	3.9	0.000
0.517	0.000	3.91	0.00	0.01	3.9	0.000
0.533	0.000	3.91	0.00	0.01	3.9	0.000
0.550	0.000	3.91	0.00	0.01	3.9	0.000
0.567	0.000	3.91	0.00	0.01	3.9	0.000
0.583	0.000	3.91	0.00	0.01	3.9	0.000
0.600	0.000	3.91	0.00	0.01	3.9	0.000
0.617	0.000	3.92	0.00	0.01	3.9	0.000
0.633	0.000	3.92	0.00	0.01	3.9	0.000
0.650	0.000	3.92	0.00	0.01	3.9	0.000
0.667	0.000	3.92	0.00	0.01	3.9	0.000
0.683	0.000	3.92	0.00	0.01	3.9	0.000
0.700	0.000	3.92	0.00	0.01	3.9	0.000
0.717	0.000	3.92	0.00	0.01	3.9	0.000
0.733	0.000	3.93	0.00	0.01	3.9	0.000
0.750	0.000	3.93	0.00	0.01	3.9	0.000
0.767	0.000	3.93	0.00	0.01	3.9	0.000
0.783	0.000	3.93	0.00	0.01	3.9	0.000
0.800	0.000	3.94	0.00	0.01	3.9	0.000
0.817	0.000	3.94	0.00	0.01	3.9	0.000
0.833	0.000	3.94	0.00	0.01	3.9	0.000
0.850	0.000	3.94	0.00	0.01	3.9	0.000
0.867	0.000	3.95	0.00	0.01	3.9	0.000
0.883	0.000	3.95	0.00	0.01	3.9	0.000
0.900	0.000	3.95	0.00	0.01	4.0	0.000
0.917	0.000	3.95	0.00	0.01	4.0	0.000
0.933	0.000	3.95	0.00	0.01	4.0	0.000

0.950	0.000	3.95	0.00	0.01	4.0	0.000
0.967	0.000	3.96	0.00	0.01	4.0	0.000
0.983	0.000	3.96	0.00	0.01	4.0	0.000
1.000	0.000	3.96	0.00	0.01	4.0	0.000
1.017	0.000	3.96	0.00	0.01	4.0	0.000
1.033	0.000	3.96	0.00	0.01	4.0	0.000
1.050	0.000	3.96	0.00	0.01	4.0	0.000
1.067	0.000	3.96	0.00	0.01	4.0	0.000
1.083	0.000	3.97	0.00	0.01	4.0	0.000
1.100	0.000	3.97	0.00	0.01	4.0	0.000
1.117	0.000	3.97	0.00	0.01	4.0	0.000
1.133	0.000	3.97	0.00	0.01	4.0	0.000
1.150	0.000	3.98	0.00	0.01	4.0	0.000
1.167	0.000	3.98	0.00	0.01	4.0	0.000
1.183	0.000	3.98	0.00	0.01	4.0	0.000
1.200	0.000	3.98	0.00	0.01	4.0	0.000
1.217	0.000	3.99	0.00	0.01	4.0	0.000
1.233	0.000	3.99	0.00	0.01	4.0	0.000
1.250	0.000	3.99	0.00	0.01	4.0	0.000
1.267	0.000	3.99	0.00	0.01	4.0	0.000
1.283	0.000	3.99	0.00	0.01	4.0	0.000
1.300	0.000	4.00	0.00	0.01	4.0	0.000
1.317	0.000	4.00	0.00	0.01	4.0	0.000
1.333	0.000	4.00	0.00	0.01	4.0	0.000
1.350	0.000	4.00	0.00	0.01	4.0	0.000
1.367	0.000	4.00	0.00	0.01	4.0	0.000
1.383	0.000	4.00	0.00	0.01	4.0	0.000
1.400	0.000	4.00	0.00	0.01	4.0	0.000
1.417	0.000	4.01	0.00	0.01	4.0	0.000
1.433	0.000	4.01	0.00	0.01	4.0	0.000
1.450	0.000	4.01	0.00	0.01	4.0	0.000
1.467	0.000	4.01	0.00	0.01	4.0	0.000
1.483	0.000	4.01	0.00	0.01	4.0	0.000
1.500	0.000	4.02	0.00	0.01	4.0	0.000
1.517	0.000	4.02	0.00	0.01	4.0	0.000
1.533	0.000	4.02	0.00	0.01	4.0	0.000
1.550	0.000	4.02	0.00	0.01	4.0	0.000
1.567	0.000	4.03	0.00	0.01	4.0	0.000
1.583	0.000	4.03	0.00	0.01	4.0	0.000
1.600	0.000	4.03	0.00	0.01	4.0	0.000
1.617	0.000	4.03	0.00	0.01	4.0	0.000
1.633	0.000	4.04	0.00	0.01	4.0	0.000
1.650	0.000	4.04	0.00	0.01	4.0	0.000
1.667	0.000	4.04	0.00	0.01	4.0	0.000
1.683	0.000	4.04	0.00	0.01	4.0	0.000
1.700	0.000	4.04	0.00	0.01	4.0	0.000
1.717	0.000	4.04	0.00	0.01	4.0	0.000
1.733	0.000	4.05	0.00	0.01	4.0	0.000
1.750	0.000	4.05	0.00	0.01	4.0	0.000
1.767	0.000	4.05	0.00	0.01	4.0	0.000
1.783	0.000	4.05	0.00	0.01	4.0	0.000
1.800	0.000	4.05	0.00	0.01	4.1	0.000
1.817	0.000	4.05	0.00	0.01	4.1	0.000
1.833	0.000	4.05	0.00	0.01	4.1	0.000
1.850	0.000	4.06	0.00	0.01	4.1	0.000
1.867	0.000	4.06	0.00	0.01	4.1	0.000
1.883	0.000	4.06	0.00	0.01	4.1	0.000
1.900	0.000	4.07	0.00	0.01	4.1	0.000
1.917	0.000	4.07	0.00	0.01	4.1	0.000
1.933	0.000	4.07	0.00	0.01	4.1	0.000
1.950	0.000	4.07	0.00	0.01	4.1	0.000
1.967	0.000	4.08	0.00	0.01	4.1	0.000
1.983	0.000	4.08	0.00	0.01	4.1	0.000
2.000	0.000	4.08	0.00	0.01	4.1	0.000
2.017	0.000	4.08	0.00	0.01	4.1	0.000
2.033	0.000	4.09	0.00	0.01	4.1	0.000
2.050	0.000	4.09	0.00	0.01	4.1	0.000
2.067	0.000	4.09	0.00	0.01	4.1	0.000
2.083	0.000	4.09	0.00	0.01	4.1	0.000
2.100	0.000	4.09	0.00	0.01	4.1	0.000
2.117	0.000	4.09	0.00	0.01	4.1	0.000
2.133	0.000	4.09	0.00	0.01	4.1	0.000
2.150	0.000	4.10	0.00	0.01	4.1	0.000
2.167	0.000	4.10	0.00	0.01	4.1	0.000
2.183	0.000	4.10	0.00	0.01	4.1	0.000
2.200	0.000	4.10	0.00	0.01	4.1	0.000
2.217	0.000	4.10	0.00	0.01	4.1	0.000
2.233	0.000	4.11	0.00	0.01	4.1	0.000
2.250	0.000	4.11	0.00	0.01	4.1	0.000

2.267	0.000	4.11	0.00	0.01	4.1	0.000
2.283	0.000	4.11	0.00	0.01	4.1	0.000
2.300	0.000	4.12	0.00	0.01	4.1	0.000
2.317	0.000	4.12	0.00	0.01	4.1	0.000
2.333	0.000	4.12	0.00	0.01	4.1	0.000
2.350	0.000	4.13	0.00	0.01	4.1	0.000
2.367	0.000	4.13	0.00	0.01	4.1	0.000
2.383	0.000	4.13	0.00	0.01	4.1	0.000
2.400	0.000	4.13	0.00	0.01	4.1	0.000
2.417	0.000	4.13	0.00	0.01	4.1	0.000
2.433	0.000	4.14	0.00	0.01	4.1	0.000
2.450	0.000	4.14	0.00	0.01	4.1	0.000
2.467	0.000	4.14	0.00	0.01	4.1	0.000
2.483	0.000	4.14	0.00	0.01	4.1	0.000
2.500	0.000	4.14	0.00	0.01	4.1	0.000
2.517	0.000	4.14	0.00	0.01	4.1	0.000
2.533	0.000	4.14	0.00	0.01	4.1	0.000
2.550	0.000	4.15	0.00	0.01	4.1	0.000
2.567	0.000	4.15	0.00	0.01	4.1	0.000
2.583	0.000	4.15	0.00	0.01	4.2	0.000
2.600	0.000	4.15	0.00	0.01	4.2	0.000
2.617	0.000	4.16	0.00	0.01	4.2	0.000
2.633	0.000	4.16	0.00	0.01	4.2	0.000
2.650	0.000	4.16	0.00	0.01	4.2	0.000
2.667	0.000	4.17	0.00	0.01	4.2	0.000
2.683	0.000	4.17	0.00	0.01	4.2	0.000
2.700	0.000	4.17	0.00	0.01	4.2	0.000
2.717	0.000	4.17	0.00	0.01	4.2	0.000
2.733	0.000	4.18	0.00	0.01	4.2	0.000
2.750	0.000	4.18	0.00	0.01	4.2	0.000
2.767	0.000	4.18	0.00	0.01	4.2	0.000
2.783	0.000	4.18	0.00	0.01	4.2	0.000
2.800	0.000	4.19	0.00	0.01	4.2	0.000
2.817	0.000	4.19	0.00	0.01	4.2	0.000
2.833	0.000	4.19	0.00	0.01	4.2	0.000
2.850	0.000	4.19	0.00	0.01	4.2	0.000
2.867	0.000	4.19	0.00	0.01	4.2	0.000
2.883	0.000	4.19	0.00	0.01	4.2	0.000
2.900	0.000	4.19	0.00	0.01	4.2	0.000
2.917	0.000	4.20	0.00	0.01	4.2	0.000
2.933	0.000	4.20	0.00	0.01	4.2	0.000
2.950	0.000	4.20	0.00	0.01	4.2	0.000
2.967	0.000	4.20	0.00	0.01	4.2	0.000
2.983	0.000	4.21	0.00	0.01	4.2	0.000
3.000	0.000	4.21	0.00	0.01	4.2	0.000
3.017	0.000	4.21	0.00	0.01	4.2	0.000
3.033	0.000	4.22	0.00	0.01	4.2	0.000
3.050	0.000	4.22	0.00	0.01	4.2	0.000
3.067	0.000	4.22	0.00	0.01	4.2	0.000
3.083	0.000	4.22	0.00	0.01	4.2	0.000
3.100	0.000	4.23	0.00	0.01	4.2	0.000
3.117	0.000	4.23	0.00	0.01	4.2	0.000
3.133	0.000	4.23	0.00	0.01	4.2	0.000
3.150	0.000	4.24	0.00	0.01	4.2	0.000
3.167	0.000	4.24	0.00	0.01	4.2	0.000
3.183	0.000	4.24	0.00	0.01	4.2	0.000
3.200	0.000	4.24	0.00	0.01	4.2	0.000
3.217	0.000	4.24	0.00	0.01	4.2	0.000
3.233	0.000	4.24	0.00	0.01	4.2	0.000
3.250	0.000	4.24	0.00	0.01	4.2	0.000
3.267	0.000	4.25	0.00	0.01	4.2	0.000
3.283	0.000	4.25	0.00	0.01	4.2	0.000
3.300	0.000	4.25	0.00	0.01	4.2	0.000
3.317	0.000	4.25	0.00	0.01	4.3	0.000
3.333	0.000	4.25	0.00	0.01	4.3	0.000
3.350	0.000	4.26	0.00	0.01	4.3	0.000
3.367	0.000	4.26	0.00	0.01	4.3	0.000
3.383	0.000	4.26	0.00	0.01	4.3	0.000
3.400	0.000	4.27	0.00	0.01	4.3	0.000
3.417	0.000	4.27	0.00	0.01	4.3	0.000
3.433	0.000	4.27	0.00	0.01	4.3	0.000
3.450	0.000	4.28	0.00	0.01	4.3	0.000
3.467	0.000	4.28	0.00	0.01	4.3	0.000
3.483	0.000	4.28	0.00	0.01	4.3	0.000
3.500	0.000	4.29	0.00	0.01	4.3	0.000
3.517	0.000	4.29	0.00	0.01	4.3	0.000
3.533	0.000	4.29	0.00	0.01	4.3	0.000
3.550	0.000	4.29	0.00	0.01	4.3	0.000
3.567	0.000	4.29	0.00	0.01	4.3	0.000

3.583	0.000	4.30	0.00	0.01	4.3	0.000
3.600	0.000	4.30	0.00	0.01	4.3	0.000
3.617	0.000	4.30	0.00	0.01	4.3	0.000
3.633	0.000	4.30	0.00	0.01	4.3	0.000
3.650	0.000	4.30	0.00	0.01	4.3	0.000
3.667	0.000	4.30	0.00	0.01	4.3	0.000
3.683	0.000	4.31	0.00	0.01	4.3	0.000
3.700	0.000	4.31	0.00	0.01	4.3	0.000
3.717	0.000	4.31	0.00	0.01	4.3	0.000
3.733	0.000	4.31	0.00	0.01	4.3	0.000
3.750	0.000	4.32	0.00	0.01	4.3	0.000
3.767	0.000	4.32	0.00	0.01	4.3	0.000
3.783	0.000	4.33	0.00	0.01	4.3	0.000
3.800	0.000	4.33	0.00	0.01	4.3	0.000
3.817	0.000	4.33	0.00	0.01	4.3	0.000
3.833	0.000	4.34	0.00	0.01	4.3	0.000
3.850	0.000	4.34	0.00	0.01	4.3	0.000
3.867	0.000	4.34	0.00	0.01	4.3	0.000
3.883	0.000	4.34	0.00	0.01	4.3	0.000
3.900	0.000	4.35	0.00	0.01	4.3	0.000
3.917	0.000	4.35	0.00	0.01	4.3	0.000
3.933	0.000	4.35	0.00	0.01	4.3	0.000
3.950	0.000	4.35	0.00	0.01	4.4	0.000
3.967	0.000	4.35	0.00	0.01	4.4	0.000
3.983	0.000	4.35	0.00	0.01	4.4	0.000
4.000	0.000	4.36	0.00	0.01	4.4	0.000
4.017	0.000	4.36	0.00	0.01	4.4	0.000
4.033	0.000	4.36	0.00	0.01	4.4	0.000
4.050	0.000	4.36	0.00	0.01	4.4	0.000
4.067	0.000	4.36	0.00	0.01	4.4	0.000
4.083	0.000	4.37	0.00	0.01	4.4	0.000
4.100	0.000	4.37	0.00	0.01	4.4	0.000
4.117	0.000	4.37	0.00	0.01	4.4	0.000
4.133	0.000	4.38	0.00	0.01	4.4	0.000
4.150	0.000	4.38	0.00	0.01	4.4	0.000
4.167	0.000	4.39	0.00	0.01	4.4	0.000
4.183	0.000	4.39	0.00	0.01	4.4	0.000
4.200	0.000	4.39	0.00	0.01	4.4	0.000
4.217	0.000	4.40	0.00	0.01	4.4	0.000
4.233	0.000	4.40	0.00	0.01	4.4	0.000
4.250	0.000	4.40	0.00	0.01	4.4	0.000
4.267	0.000	4.40	0.00	0.01	4.4	0.000
4.283	0.000	4.41	0.00	0.01	4.4	0.000
4.300	0.000	4.41	0.00	0.01	4.4	0.000
4.317	0.000	4.41	0.00	0.01	4.4	0.000
4.333	0.000	4.41	0.00	0.01	4.4	0.000
4.350	0.000	4.41	0.00	0.01	4.4	0.000
4.367	0.000	4.42	0.00	0.01	4.4	0.000
4.383	0.000	4.42	0.00	0.01	4.4	0.000
4.400	0.000	4.42	0.00	0.01	4.4	0.000
4.417	0.000	4.42	0.00	0.01	4.4	0.000
4.433	0.000	4.42	0.00	0.01	4.4	0.000
4.450	0.000	4.43	0.00	0.01	4.4	0.000
4.467	0.000	4.43	0.00	0.01	4.4	0.000
4.483	0.000	4.43	0.00	0.01	4.4	0.000
4.500	0.000	4.44	0.00	0.01	4.4	0.000
4.517	0.000	4.44	0.00	0.01	4.4	0.000
4.533	0.000	4.44	0.00	0.01	4.4	0.000
4.550	0.000	4.45	0.00	0.01	4.4	0.000
4.567	0.000	4.45	0.00	0.01	4.5	0.000
4.583	0.000	4.46	0.00	0.01	4.5	0.000
4.600	0.000	4.46	0.00	0.01	4.5	0.000
4.617	0.000	4.46	0.00	0.01	4.5	0.000
4.633	0.000	4.47	0.00	0.01	4.5	0.000
4.650	0.000	4.47	0.00	0.01	4.5	0.000
4.667	0.000	4.47	0.00	0.01	4.5	0.000
4.683	0.000	4.47	0.00	0.01	4.5	0.000
4.700	0.000	4.47	0.00	0.01	4.5	0.000
4.717	0.000	4.48	0.00	0.01	4.5	0.000
4.733	0.000	4.48	0.00	0.01	4.5	0.000
4.750	0.000	4.48	0.00	0.01	4.5	0.000
4.767	0.000	4.48	0.00	0.01	4.5	0.000
4.783	0.000	4.48	0.00	0.01	4.5	0.000
4.800	0.000	4.48	0.00	0.01	4.5	0.000
4.817	0.000	4.49	0.00	0.01	4.5	0.000
4.833	0.000	4.49	0.00	0.01	4.5	0.000
4.850	0.000	4.50	0.00	0.01	4.5	0.000
4.867	0.000	4.50	0.00	0.01	4.5	0.000
4.883	0.000	4.50	0.00	0.01	4.5	0.000

4.900	0.000	4.51	0.00	0.01	4.5	0.000
4.917	0.000	4.51	0.00	0.01	4.5	0.000
4.933	0.000	4.51	0.00	0.01	4.5	0.000
4.950	0.000	4.52	0.00	0.01	4.5	0.000
4.967	0.000	4.52	0.00	0.01	4.5	0.000
4.983	0.000	4.53	0.00	0.01	4.5	0.000
5.000	0.000	4.53	0.00	0.01	4.5	0.000
5.017	0.000	4.53	0.00	0.01	4.5	0.000
5.033	0.000	4.53	0.00	0.01	4.5	0.000
5.050	0.000	4.54	0.00	0.01	4.5	0.000
5.067	0.000	4.54	0.00	0.01	4.5	0.000
5.083	0.000	4.54	0.00	0.01	4.5	0.000
5.100	0.000	4.54	0.00	0.01	4.5	0.000
5.117	0.000	4.54	0.00	0.01	4.5	0.000
5.133	0.000	4.55	0.00	0.01	4.5	0.000
5.150	0.000	4.55	0.00	0.01	4.5	0.000
5.167	0.000	4.55	0.00	0.01	4.5	0.000
5.183	0.000	4.55	0.00	0.01	4.6	0.000
5.200	0.000	4.56	0.00	0.01	4.6	0.000
5.217	0.000	4.56	0.00	0.01	4.6	0.000
5.233	0.000	4.56	0.00	0.01	4.6	0.000
5.250	0.000	4.57	0.00	0.01	4.6	0.000
5.267	0.000	4.57	0.00	0.01	4.6	0.000
5.283	0.000	4.58	0.00	0.01	4.6	0.000
5.300	0.000	4.58	0.00	0.01	4.6	0.000
5.317	0.000	4.58	0.00	0.01	4.6	0.000
5.333	0.000	4.59	0.00	0.01	4.6	0.000
5.350	0.000	4.59	0.00	0.01	4.6	0.000
5.367	0.000	4.60	0.00	0.01	4.6	0.000
5.383	0.000	4.60	0.00	0.01	4.6	0.000
5.400	0.000	4.60	0.00	0.01	4.6	0.000
5.417	0.000	4.60	0.00	0.01	4.6	0.000
5.433	0.000	4.60	0.00	0.01	4.6	0.000
5.450	0.000	4.61	0.00	0.01	4.6	0.000
5.467	0.000	4.61	0.00	0.01	4.6	0.000
5.483	0.000	4.61	0.00	0.01	4.6	0.000
5.500	0.000	4.61	0.00	0.01	4.6	0.000
5.517	0.000	4.62	0.00	0.01	4.6	0.000
5.533	0.000	4.62	0.00	0.01	4.6	0.000
5.550	0.000	4.62	0.00	0.01	4.6	0.000
5.567	0.000	4.62	0.00	0.01	4.6	0.000
5.583	0.000	4.63	0.00	0.01	4.6	0.000
5.600	0.000	4.63	0.00	0.01	4.6	0.000
5.617	0.000	4.64	0.00	0.01	4.6	0.000
5.633	0.000	4.64	0.00	0.01	4.6	0.000
5.650	0.000	4.64	0.00	0.01	4.6	0.000
5.667	0.000	4.65	0.00	0.01	4.6	0.000
5.683	0.000	4.65	0.00	0.01	4.7	0.000
5.700	0.000	4.66	0.00	0.01	4.7	0.000
5.717	0.000	4.66	0.00	0.01	4.7	0.000
5.733	0.000	4.67	0.00	0.01	4.7	0.000
5.750	0.000	4.67	0.00	0.01	4.7	0.000
5.767	0.000	4.67	0.00	0.01	4.7	0.000
5.783	0.000	4.67	0.00	0.01	4.7	0.000
5.800	0.000	4.68	0.00	0.01	4.7	0.000
5.817	0.000	4.68	0.00	0.01	4.7	0.000
5.833	0.000	4.68	0.00	0.01	4.7	0.000
5.850	0.000	4.68	0.00	0.01	4.7	0.000
5.867	0.000	4.68	0.00	0.01	4.7	0.000
5.883	0.000	4.69	0.00	0.01	4.7	0.000
5.900	0.000	4.69	0.00	0.01	4.7	0.000
5.917	0.000	4.69	0.00	0.01	4.7	0.000
5.933	0.000	4.69	0.00	0.01	4.7	0.000
5.950	0.000	4.70	0.00	0.01	4.7	0.000
5.967	0.000	4.70	0.00	0.01	4.7	0.000
5.983	0.000	4.71	0.00	0.01	4.7	0.000
6.000	0.000	4.71	0.00	0.01	4.7	0.000
6.017	0.000	4.72	0.00	0.01	4.7	0.000
6.033	0.000	4.72	0.00	0.01	4.7	0.000
6.050	0.000	4.73	0.00	0.01	4.7	0.000
6.067	0.000	4.73	0.00	0.01	4.7	0.000
6.083	0.000	4.73	0.00	0.01	4.7	0.000
6.100	0.000	4.74	0.00	0.01	4.7	0.000
6.117	0.000	4.74	0.00	0.01	4.7	0.000
6.133	0.000	4.75	0.00	0.01	4.7	0.000
6.150	0.000	4.75	0.00	0.01	4.7	0.000
6.167	0.000	4.75	0.00	0.01	4.8	0.000
6.183	0.000	4.75	0.00	0.01	4.8	0.000
6.200	0.000	4.75	0.00	0.01	4.8	0.000

6.217	0.000	4.76	0.00	0.01	4.8	0.000
6.233	0.000	4.76	0.00	0.01	4.8	0.000
6.250	0.000	4.76	0.00	0.01	4.8	0.000
6.267	0.000	4.76	0.00	0.01	4.8	0.000
6.283	0.000	4.77	0.00	0.01	4.8	0.000
6.300	0.000	4.77	0.00	0.01	4.8	0.000
6.317	0.000	4.77	0.00	0.01	4.8	0.000
6.333	0.000	4.78	0.00	0.01	4.8	0.000
6.350	0.000	4.78	0.00	0.01	4.8	0.000
6.367	0.000	4.79	0.00	0.01	4.8	0.000
6.383	0.000	4.79	0.00	0.01	4.8	0.000
6.400	0.000	4.80	0.00	0.01	4.8	0.000
6.417	0.000	4.80	0.00	0.01	4.8	0.000
6.433	0.000	4.81	0.00	0.01	4.8	0.000
6.450	0.000	4.81	0.00	0.01	4.8	0.000
6.467	0.000	4.82	0.00	0.01	4.8	0.000
6.483	0.000	4.82	0.00	0.01	4.8	0.000
6.500	0.000	4.82	0.00	0.01	4.8	0.000
6.517	0.000	4.83	0.00	0.01	4.8	0.000
6.533	0.000	4.83	0.00	0.01	4.8	0.000
6.550	0.000	4.83	0.00	0.01	4.8	0.000
6.567	0.000	4.83	0.00	0.01	4.8	0.000
6.583	0.000	4.84	0.00	0.01	4.8	0.000
6.600	0.000	4.84	0.00	0.01	4.8	0.000
6.617	0.000	4.84	0.00	0.01	4.8	0.000
6.633	0.000	4.84	0.00	0.01	4.8	0.000
6.650	0.000	4.85	0.00	0.01	4.8	0.000
6.667	0.000	4.85	0.00	0.01	4.8	0.000
6.683	0.000	4.85	0.00	0.01	4.9	0.000
6.700	0.000	4.86	0.00	0.01	4.9	0.000
6.717	0.000	4.86	0.00	0.01	4.9	0.000
6.733	0.000	4.87	0.00	0.01	4.9	0.000
6.750	0.000	4.87	0.00	0.01	4.9	0.000
6.767	0.000	4.88	0.00	0.01	4.9	0.000
6.783	0.000	4.88	0.00	0.01	4.9	0.000
6.800	0.000	4.89	0.00	0.01	4.9	0.000
6.817	0.000	4.89	0.00	0.01	4.9	0.000
6.833	0.000	4.90	0.00	0.01	4.9	0.000
6.850	0.000	4.90	0.00	0.01	4.9	0.000
6.867	0.000	4.91	0.00	0.01	4.9	0.000
6.883	0.000	4.91	0.00	0.01	4.9	0.000
6.900	0.000	4.91	0.00	0.01	4.9	0.000
6.917	0.000	4.91	0.00	0.01	4.9	0.000
6.933	0.000	4.92	0.00	0.01	4.9	0.000
6.950	0.000	4.92	0.00	0.01	4.9	0.000
6.967	0.000	4.92	0.00	0.01	4.9	0.000
6.983	0.000	4.92	0.00	0.01	4.9	0.000
7.000	0.000	4.93	0.00	0.01	4.9	0.000
7.017	0.000	4.93	0.00	0.01	4.9	0.000
7.033	0.000	4.93	0.00	0.01	4.9	0.000
7.050	0.000	4.94	0.00	0.01	4.9	0.000
7.067	0.000	4.94	0.00	0.01	4.9	0.000
7.083	0.000	4.95	0.00	0.01	4.9	0.000
7.100	0.000	4.95	0.00	0.01	5.0	0.000
7.117	0.000	4.96	0.00	0.01	5.0	0.000
7.133	0.000	4.96	0.00	0.01	5.0	0.000
7.150	0.000	4.97	0.00	0.01	5.0	0.000
7.167	0.000	4.97	0.00	0.01	5.0	0.000
7.183	0.000	4.98	0.00	0.01	5.0	0.000
7.200	0.000	4.98	0.00	0.01	5.0	0.000
7.217	0.000	4.99	0.00	0.01	5.0	0.000
7.233	0.000	4.99	0.00	0.01	5.0	0.000
7.250	0.000	5.00	0.00	0.01	5.0	0.000
7.267	0.000	5.00	0.00	0.01	5.0	0.000
7.283	0.000	5.00	0.00	0.01	5.0	0.000
7.300	0.000	5.01	0.00	0.01	5.0	0.000
7.317	0.000	5.01	0.00	0.01	5.0	0.000
7.333	0.000	5.01	0.00	0.01	5.0	0.000
7.350	0.000	5.01	0.00	0.01	5.0	0.000
7.367	0.000	5.02	0.00	0.01	5.0	0.000
7.383	0.000	5.02	0.00	0.01	5.0	0.000
7.400	0.000	5.02	0.00	0.01	5.0	0.000
7.417	0.000	5.02	0.00	0.01	5.0	0.000
7.433	0.000	5.03	0.00	0.01	5.0	0.000
7.450	0.000	5.03	0.00	0.01	5.0	0.000
7.467	0.000	5.04	0.00	0.01	5.0	0.000
7.483	0.000	5.05	0.00	0.01	5.0	0.000
7.500	0.000	5.05	0.00	0.01	5.1	0.000
7.517	0.000	5.06	0.00	0.01	5.1	0.000

7.533	0.000	5.06	0.00	0.01	5.1	0.000
7.550	0.000	5.07	0.00	0.01	5.1	0.000
7.567	0.000	5.07	0.00	0.01	5.1	0.000
7.583	0.000	5.08	0.00	0.01	5.1	0.000
7.600	0.000	5.09	0.00	0.01	5.1	0.000
7.617	0.000	5.09	0.00	0.01	5.1	0.000
7.633	0.000	5.09	0.00	0.01	5.1	0.000
7.650	0.000	5.10	0.00	0.01	5.1	0.000
7.667	0.000	5.10	0.00	0.01	5.1	0.000
7.683	0.000	5.10	0.00	0.01	5.1	0.000
7.700	0.000	5.10	0.00	0.01	5.1	0.000
7.717	0.000	5.11	0.00	0.01	5.1	0.000
7.733	0.000	5.11	0.00	0.01	5.1	0.000
7.750	0.000	5.11	0.00	0.01	5.1	0.000
7.767	0.000	5.12	0.00	0.01	5.1	0.000
7.783	0.000	5.12	0.00	0.01	5.1	0.000
7.800	0.000	5.12	0.00	0.01	5.1	0.000
7.817	0.000	5.13	0.00	0.01	5.1	0.000
7.833	0.000	5.14	0.00	0.01	5.1	0.000
7.850	0.000	5.14	0.00	0.01	5.1	0.000
7.867	0.000	5.15	0.00	0.01	5.1	0.000
7.883	0.000	5.15	0.00	0.01	5.2	0.000
7.900	0.000	5.16	0.00	0.01	5.2	0.000
7.917	0.000	5.17	0.00	0.01	5.2	0.000
7.933	0.000	5.17	0.00	0.01	5.2	0.000
7.950	0.000	5.18	0.00	0.01	5.2	0.000
7.967	0.000	5.18	0.00	0.01	5.2	0.000
7.983	0.000	5.19	0.00	0.01	5.2	0.000
8.000	0.000	5.19	0.00	0.01	5.2	0.000
8.017	0.000	5.20	0.00	0.01	5.2	0.000
8.033	0.000	5.20	0.00	0.01	5.2	0.000
8.050	0.000	5.20	0.00	0.01	5.2	0.000
8.067	0.000	5.20	0.00	0.01	5.2	0.000
8.083	0.000	5.21	0.00	0.01	5.2	0.000
8.100	0.000	5.21	0.00	0.01	5.2	0.000
8.117	0.000	5.21	0.00	0.01	5.2	0.000
8.133	0.000	5.22	0.00	0.01	5.2	0.000
8.150	0.000	5.22	0.00	0.01	5.2	0.000
8.167	0.000	5.22	0.00	0.01	5.2	0.000
8.183	0.000	5.23	0.00	0.01	5.2	0.000
8.200	0.000	5.24	0.00	0.01	5.2	0.000
8.217	0.000	5.24	0.00	0.01	5.2	0.000
8.233	0.000	5.25	0.00	0.01	5.2	0.000
8.250	0.000	5.26	0.00	0.01	5.3	0.000
8.267	0.000	5.26	0.00	0.01	5.3	0.000
8.283	0.000	5.27	0.00	0.01	5.3	0.000
8.300	0.000	5.27	0.00	0.01	5.3	0.000
8.317	0.000	5.28	0.00	0.01	5.3	0.000
8.333	0.000	5.29	0.00	0.01	5.3	0.000
8.350	0.000	5.29	0.00	0.01	5.3	0.000
8.367	0.000	5.30	0.00	0.01	5.3	0.000
8.383	0.000	5.30	0.00	0.01	5.3	0.000
8.400	0.000	5.30	0.00	0.01	5.3	0.000
8.417	0.000	5.31	0.00	0.01	5.3	0.000
8.433	0.000	5.31	0.00	0.01	5.3	0.000
8.450	0.000	5.31	0.00	0.01	5.3	0.000
8.467	0.000	5.32	0.00	0.01	5.3	0.000
8.483	0.000	5.32	0.00	0.01	5.3	0.000
8.500	0.000	5.32	0.00	0.01	5.3	0.000
8.517	0.000	5.33	0.00	0.01	5.3	0.000
8.533	0.000	5.33	0.00	0.01	5.3	0.000
8.550	0.000	5.34	0.00	0.01	5.3	0.000
8.567	0.000	5.34	0.00	0.01	5.3	0.000
8.583	0.000	5.35	0.00	0.01	5.4	0.000
8.600	0.000	5.36	0.00	0.01	5.4	0.000
8.617	0.000	5.36	0.00	0.01	5.4	0.000
8.633	0.000	5.37	0.00	0.01	5.4	0.000
8.650	0.000	5.38	0.00	0.01	5.4	0.000
8.667	0.000	5.38	0.00	0.01	5.4	0.000
8.683	0.000	5.39	0.00	0.01	5.4	0.000
8.700	0.000	5.40	0.00	0.01	5.4	0.000
8.717	0.000	5.41	0.00	0.01	5.4	0.000
8.733	0.000	5.41	0.00	0.01	5.4	0.000
8.750	0.000	5.42	0.00	0.01	5.4	0.000
8.767	0.000	5.42	0.00	0.01	5.4	0.000
8.783	0.000	5.42	0.00	0.01	5.4	0.000
8.800	0.000	5.43	0.00	0.01	5.4	0.000
8.817	0.000	5.43	0.00	0.01	5.4	0.000
8.833	0.000	5.43	0.00	0.01	5.4	0.000

8.850	0.000	5.44	0.00	0.01	5.4	0.000
8.867	0.000	5.44	0.00	0.01	5.4	0.000
8.883	0.000	5.44	0.00	0.01	5.4	0.000
8.900	0.000	5.45	0.00	0.01	5.4	0.000
8.917	0.000	5.45	0.00	0.01	5.5	0.000
8.933	0.000	5.46	0.00	0.01	5.5	0.000
8.950	0.000	5.47	0.00	0.01	5.5	0.000
8.967	0.000	5.47	0.00	0.01	5.5	0.000
8.983	0.000	5.48	0.00	0.01	5.5	0.000
9.000	0.000	5.49	0.00	0.01	5.5	0.000
9.017	0.000	5.50	0.00	0.01	5.5	0.000
9.033	0.000	5.50	0.00	0.01	5.5	0.000
9.050	0.000	5.51	0.00	0.01	5.5	0.000
9.067	0.000	5.52	0.00	0.01	5.5	0.000
9.083	0.000	5.53	0.00	0.01	5.5	0.000
9.100	0.000	5.53	0.00	0.01	5.5	0.000
9.117	0.000	5.54	0.00	0.01	5.5	0.000
9.133	0.000	5.54	0.00	0.01	5.5	0.000
9.150	0.000	5.55	0.00	0.01	5.5	0.000
9.167	0.000	5.55	0.00	0.01	5.5	0.000
9.183	0.000	5.55	0.00	0.01	5.6	0.000
9.200	0.000	5.56	0.00	0.01	5.6	0.000
9.217	0.000	5.56	0.00	0.01	5.6	0.000
9.233	0.000	5.56	0.00	0.01	5.6	0.000
9.250	0.000	5.57	0.00	0.01	5.6	0.000
9.267	0.000	5.57	0.00	0.01	5.6	0.000
9.283	0.000	5.58	0.00	0.01	5.6	0.000
9.300	0.000	5.58	0.00	0.01	5.6	0.000
9.317	0.000	5.59	0.00	0.01	5.6	0.000
9.333	0.000	5.60	0.00	0.01	5.6	0.000
9.350	0.000	5.61	0.00	0.01	5.6	0.000
9.367	0.000	5.61	0.00	0.01	5.6	0.000
9.383	0.000	5.62	0.00	0.01	5.6	0.000
9.400	0.000	5.63	0.00	0.01	5.6	0.000
9.417	0.000	5.64	0.00	0.01	5.6	0.000
9.433	0.000	5.65	0.00	0.01	5.6	0.000
9.450	0.000	5.65	0.00	0.01	5.7	0.000
9.467	0.000	5.66	0.00	0.01	5.7	0.000
9.483	0.000	5.67	0.00	0.01	5.7	0.000
9.500	0.000	5.67	0.00	0.01	5.7	0.000
9.517	0.000	5.68	0.00	0.01	5.7	0.000
9.533	0.000	5.68	0.00	0.01	5.7	0.000
9.550	0.000	5.69	0.00	0.01	5.7	0.000
9.567	0.000	5.69	0.00	0.01	5.7	0.000
9.583	0.000	5.69	0.00	0.01	5.7	0.000
9.600	0.000	5.70	0.00	0.01	5.7	0.000
9.617	0.000	5.70	0.00	0.01	5.7	0.000
9.633	0.000	5.71	0.00	0.01	5.7	0.000
9.650	0.000	5.71	0.00	0.01	5.7	0.000
9.667	0.000	5.72	0.00	0.01	5.7	0.000
9.683	0.000	5.72	0.00	0.01	5.7	0.000
9.700	0.000	5.73	0.00	0.01	5.7	0.000
9.717	0.000	5.74	0.00	0.01	5.7	0.000
9.733	0.000	5.75	0.00	0.01	5.8	0.000
9.750	0.000	5.76	0.00	0.01	5.8	0.000
9.767	0.000	5.77	0.00	0.01	5.8	0.000
9.783	0.000	5.78	0.00	0.01	5.8	0.000
9.800	0.000	5.79	0.00	0.01	5.8	0.000
9.817	0.000	5.79	0.00	0.01	5.8	0.000
9.833	0.000	5.80	0.00	0.01	5.8	0.000
9.850	0.000	5.81	0.00	0.01	5.8	0.000
9.867	0.000	5.82	0.00	0.01	5.8	0.000
9.883	0.000	5.82	0.00	0.01	5.8	0.000
9.900	0.000	5.83	0.00	0.01	5.8	0.000
9.917	0.000	5.83	0.00	0.01	5.8	0.000
9.933	0.000	5.83	0.00	0.01	5.8	0.000
9.950	0.000	5.84	0.00	0.01	5.8	0.000
9.967	0.000	5.84	0.00	0.01	5.8	0.000
9.983	0.000	5.85	0.00	0.01	5.8	0.000
10.000	0.000	5.85	0.00	0.01	5.9	0.000
10.017	0.000	5.86	0.00	0.01	5.9	0.000
10.033	0.000	5.86	0.00	0.01	5.9	0.000
10.050	0.000	5.87	0.00	0.01	5.9	0.000
10.067	0.000	5.88	0.00	0.01	5.9	0.000
10.083	0.000	5.89	0.00	0.01	5.9	0.000
10.100	0.000	5.90	0.00	0.01	5.9	0.000
10.117	0.000	5.91	0.00	0.01	5.9	0.000
10.133	0.000	5.92	0.00	0.01	5.9	0.000
10.150	0.000	5.93	0.00	0.01	5.9	0.000

10.167	0.000	5.94	0.00	0.01	5.9	0.000
10.183	0.000	5.95	0.00	0.01	5.9	0.000
10.200	0.000	5.96	0.00	0.01	6.0	0.000
10.217	0.000	5.97	0.00	0.01	6.0	0.000
10.233	0.000	5.97	0.00	0.01	6.0	0.000
10.250	0.000	5.98	0.00	0.01	6.0	0.000
10.267	0.000	5.98	0.00	0.01	6.0	0.000
10.283	0.000	5.99	0.00	0.01	6.0	0.000
10.300	0.000	5.99	0.00	0.01	6.0	0.000
10.317	0.000	6.00	0.00	0.01	6.0	0.000
10.333	0.000	6.00	0.00	0.01	6.0	0.000
10.350	0.000	6.01	0.00	0.01	6.0	0.000
10.367	0.000	6.01	0.00	0.01	6.0	0.000
10.383	0.000	6.02	0.00	0.01	6.0	0.000
10.400	0.000	6.02	0.00	0.01	6.0	0.000
10.417	0.000	6.03	0.00	0.01	6.0	0.000
10.433	0.000	6.04	0.00	0.01	6.0	0.000
10.450	0.000	6.05	0.00	0.01	6.0	0.000
10.467	0.000	6.06	0.00	0.01	6.1	0.000
10.483	0.000	6.07	0.00	0.01	6.1	0.000
10.500	0.000	6.08	0.00	0.01	6.1	0.000
10.517	0.000	6.09	0.00	0.01	6.1	0.000
10.533	0.000	6.10	0.00	0.01	6.1	0.000
10.550	0.000	6.11	0.00	0.01	6.1	0.000
10.567	0.000	6.12	0.00	0.01	6.1	0.000
10.583	0.000	6.13	0.00	0.01	6.1	0.000
10.600	0.000	6.14	0.00	0.01	6.1	0.000
10.617	0.000	6.15	0.00	0.01	6.1	0.000
10.633	0.000	6.15	0.00	0.01	6.2	0.000
10.650	0.000	6.16	0.00	0.01	6.2	0.000
10.667	0.000	6.16	0.00	0.01	6.2	0.000
10.683	0.000	6.17	0.00	0.01	6.2	0.000
10.700	0.000	6.17	0.00	0.01	6.2	0.000
10.717	0.000	6.18	0.00	0.01	6.2	0.000
10.733	0.000	6.19	0.00	0.01	6.2	0.000
10.750	0.000	6.19	0.00	0.01	6.2	0.000
10.767	0.000	6.20	0.00	0.01	6.2	0.000
10.783	0.000	6.20	0.00	0.01	6.2	0.000
10.800	0.000	6.21	0.00	0.01	6.2	0.000
10.817	0.000	6.23	0.00	0.01	6.2	0.000
10.833	0.000	6.24	0.00	0.01	6.2	0.000
10.850	0.000	6.25	0.00	0.01	6.2	0.000
10.867	0.000	6.26	0.00	0.01	6.3	0.000
10.883	0.000	6.27	0.00	0.01	6.3	0.000
10.900	0.000	6.28	0.00	0.01	6.3	0.000
10.917	0.000	6.29	0.00	0.01	6.3	0.000
10.933	0.000	6.31	0.00	0.01	6.3	0.000
10.950	0.000	6.32	0.00	0.01	6.3	0.000
10.967	0.000	6.33	0.00	0.01	6.3	0.000
10.983	0.000	6.34	0.00	0.01	6.3	0.000
11.000	0.000	6.34	0.00	0.01	6.3	0.000
11.017	0.000	6.35	0.00	0.01	6.3	0.000
11.033	0.000	6.35	0.00	0.01	6.4	0.000
11.050	0.000	6.36	0.00	0.01	6.4	0.000
11.067	0.000	6.37	0.00	0.01	6.4	0.000
11.083	0.000	6.37	0.00	0.01	6.4	0.000
11.100	0.000	6.38	0.00	0.01	6.4	0.000
11.117	0.000	6.38	0.00	0.01	6.4	0.000
11.133	0.000	6.39	0.00	0.01	6.4	0.000
11.150	0.000	6.40	0.00	0.01	6.4	0.000
11.167	0.000	6.41	0.00	0.01	6.4	0.000
11.183	0.000	6.42	0.00	0.01	6.4	0.000
11.200	0.000	6.43	0.00	0.01	6.4	0.000
11.217	0.000	6.44	0.00	0.01	6.4	0.000
11.233	0.000	6.46	0.00	0.01	6.5	0.000
11.250	0.000	6.47	0.00	0.01	6.5	0.000
11.267	0.000	6.48	0.00	0.01	6.5	0.000
11.283	0.000	6.50	0.00	0.01	6.5	0.000
11.300	0.000	6.51	0.00	0.01	6.5	0.000
11.317	0.000	6.52	0.00	0.02	6.5	0.000
11.333	0.000	6.53	0.00	0.02	6.5	0.000
11.350	0.000	6.54	0.00	0.02	6.5	0.000
11.367	0.000	6.55	0.00	0.02	6.6	0.000
11.383	0.000	6.56	0.00	0.02	6.6	0.000
11.400	0.000	6.56	0.00	0.02	6.6	0.000
11.417	0.000	6.57	0.00	0.02	6.6	0.000
11.433	0.000	6.58	0.00	0.02	6.6	0.000
11.450	0.000	6.58	0.00	0.02	6.6	0.000
11.467	0.000	6.59	0.00	0.02	6.6	0.000

11.483	0.000	6.60	0.00	0.02	6.6	0.000
11.500	0.000	6.60	0.00	0.02	6.6	0.000
11.517	0.000	6.61	0.00	0.02	6.6	0.000
11.533	0.000	6.62	0.00	0.02	6.6	0.000
11.550	0.000	6.63	0.00	0.02	6.6	0.000
11.567	0.000	6.65	0.00	0.02	6.6	0.000
11.583	0.000	6.66	0.00	0.02	6.7	0.000
11.600	0.000	6.68	0.00	0.02	6.7	0.000
11.617	0.000	6.69	0.00	0.02	6.7	0.000
11.633	0.000	6.71	0.00	0.02	6.7	0.000
11.650	0.000	6.72	0.00	0.02	6.7	0.000
11.667	0.000	6.73	0.00	0.02	6.7	0.000
11.683	0.000	6.75	0.00	0.02	6.7	0.000
11.700	0.000	6.76	0.00	0.02	6.8	0.000
11.717	0.000	6.78	0.00	0.02	6.8	0.000
11.733	0.000	6.78	0.00	0.02	6.8	0.000
11.750	0.000	6.79	0.00	0.02	6.8	0.000
11.767	0.000	6.80	0.00	0.02	6.8	0.000
11.783	0.000	6.81	0.00	0.02	6.8	0.000
11.800	0.000	6.81	0.00	0.02	6.8	0.000
11.817	0.000	6.82	0.00	0.02	6.8	0.000
11.833	0.000	6.83	0.00	0.02	6.8	0.000
11.850	0.000	6.84	0.00	0.02	6.8	0.000
11.867	0.000	6.84	0.00	0.02	6.8	0.000
11.883	0.000	6.85	0.00	0.02	6.9	0.000
11.900	0.000	6.86	0.00	0.02	6.9	0.000
11.917	0.000	6.88	0.00	0.02	6.9	0.000
11.933	0.000	6.90	0.00	0.02	6.9	0.000
11.950	0.000	6.92	0.00	0.02	6.9	0.000
11.967	0.000	6.94	0.00	0.02	6.9	0.000
11.983	0.000	6.96	0.00	0.02	7.0	0.000
12.000	0.000	6.98	0.00	0.02	7.0	0.000
12.017	0.000	6.99	0.00	0.02	7.0	0.000
12.033	0.000	7.01	0.00	0.02	7.0	0.000
12.050	0.000	7.03	0.00	0.02	7.0	0.000
12.067	0.000	7.05	0.00	0.02	7.1	0.000
12.083	0.000	7.07	0.00	0.02	7.1	0.000
12.100	0.000	7.10	0.00	0.02	7.1	0.000
12.117	0.000	7.13	0.00	0.02	7.1	0.000
12.133	0.000	7.15	0.00	0.02	7.2	0.000
12.150	0.000	7.18	0.00	0.02	7.2	0.000
12.167	0.000	7.21	0.00	0.02	7.2	0.000
12.183	0.000	7.24	0.00	0.02	7.2	0.000
12.200	0.000	7.27	0.00	0.02	7.3	0.000
12.217	0.000	7.30	0.00	0.02	7.3	0.000
12.233	0.000	7.32	0.00	0.02	7.3	0.000
12.250	0.000	7.35	0.00	0.02	7.4	0.000
12.267	0.000	7.38	0.00	0.02	7.4	0.000
12.283	0.000	7.40	0.00	0.02	7.4	0.000
12.300	0.000	7.42	0.00	0.02	7.4	0.000
12.317	0.000	7.44	0.00	0.02	7.4	0.000
12.333	0.000	7.46	0.00	0.02	7.5	0.000
12.350	0.000	7.48	0.00	0.02	7.5	0.000
12.367	0.000	7.50	0.00	0.02	7.5	0.000
12.383	0.000	7.51	0.00	0.02	7.5	0.000
12.400	0.000	7.53	0.00	0.02	7.5	0.000
12.417	0.000	7.55	0.00	0.02	7.5	0.000
12.433	0.000	7.57	0.00	0.02	7.6	0.000
12.450	0.000	7.59	0.00	0.02	7.6	0.000
12.467	0.000	7.60	0.00	0.02	7.6	0.000
12.483	0.000	7.61	0.00	0.02	7.6	0.000
12.500	0.000	7.62	0.00	0.02	7.6	0.000
12.517	0.000	7.63	0.00	0.02	7.6	0.000
12.533	0.000	7.64	0.00	0.02	7.6	0.000
12.550	0.000	7.65	0.00	0.02	7.7	0.000
12.567	0.000	7.66	0.00	0.02	7.7	0.000
12.583	0.000	7.67	0.00	0.02	7.7	0.000
12.600	0.000	7.68	0.00	0.02	7.7	0.000
12.617	0.000	7.69	0.00	0.02	7.7	0.000
12.633	0.000	7.70	0.00	0.02	7.7	0.000
12.650	0.000	7.71	0.00	0.02	7.7	0.000
12.667	0.000	7.73	0.00	0.02	7.7	0.000
12.683	0.000	7.75	0.00	0.02	7.8	0.000
12.700	0.000	7.77	0.00	0.02	7.8	0.000
12.717	0.000	7.80	0.00	0.02	7.8	0.000
12.733	0.000	7.82	0.00	0.02	7.8	0.000
12.750	0.000	7.84	0.00	0.02	7.8	0.000
12.767	0.000	7.86	0.00	0.02	7.9	0.000
12.783	0.000	7.88	0.00	0.02	7.9	0.000

12.800	0.000	7.90	0.00	0.02	7.9	0.000
12.817	0.000	7.92	0.00	0.02	7.9	0.000
12.833	0.000	7.94	0.00	0.02	7.9	0.000
12.850	0.000	7.96	0.00	0.02	8.0	0.000
12.867	0.000	7.97	0.00	0.02	8.0	0.000
12.883	0.000	7.98	0.00	0.02	8.0	0.000
12.900	0.000	7.99	0.00	0.02	8.0	0.000
12.917	0.000	8.00	0.00	0.02	8.0	0.000
12.933	0.000	8.01	0.00	0.02	8.0	0.000
12.950	0.000	8.02	0.00	0.02	8.0	0.000
12.967	0.000	8.04	0.00	0.02	8.0	0.000
12.983	0.000	8.05	0.00	0.02	8.0	0.000
13.000	0.000	8.06	0.00	0.02	8.1	0.000
13.017	0.000	8.07	0.00	0.02	8.1	0.000
13.033	0.000	8.09	0.00	0.02	8.1	0.000
13.050	0.000	8.12	0.00	0.02	8.1	0.000
13.067	0.000	8.14	0.00	0.02	8.1	0.000
13.083	0.000	8.17	0.00	0.02	8.2	0.000
13.100	0.000	8.19	0.00	0.02	8.2	0.000
13.117	0.000	8.21	0.00	0.02	8.2	0.000
13.133	0.000	8.24	0.00	0.02	8.2	0.000
13.150	0.000	8.26	0.00	0.02	8.3	0.000
13.167	0.000	8.29	0.00	0.02	8.3	0.000
13.183	0.000	8.31	0.00	0.02	8.3	0.000
13.200	0.000	8.34	0.00	0.02	8.3	0.000
13.217	0.000	8.36	0.00	0.02	8.4	0.000
13.233	0.000	8.37	0.00	0.02	8.4	0.000
13.250	0.000	8.39	0.00	0.02	8.4	0.000
13.267	0.000	8.40	0.00	0.02	8.4	0.000
13.283	0.000	8.41	0.00	0.02	8.4	0.000
13.300	0.000	8.43	0.00	0.02	8.4	0.000
13.317	0.000	8.44	0.00	0.02	8.4	0.000
13.333	0.000	8.45	0.00	0.02	8.5	0.000
13.350	0.000	8.47	0.00	0.02	8.5	0.000
13.367	0.000	8.48	0.00	0.02	8.5	0.000
13.383	0.000	8.49	0.00	0.02	8.5	0.000
13.400	0.000	8.51	0.00	0.02	8.5	0.000
13.417	0.000	8.54	0.00	0.02	8.5	0.000
13.433	0.000	8.57	0.00	0.02	8.6	0.000
13.450	0.000	8.60	0.00	0.02	8.6	0.000
13.467	0.000	8.63	0.00	0.02	8.6	0.000
13.483	0.000	8.66	0.00	0.02	8.7	0.000
13.500	0.000	8.69	0.00	0.02	8.7	0.000
13.517	0.000	8.72	0.00	0.02	8.7	0.000
13.533	0.000	8.75	0.00	0.02	8.8	0.000
13.550	0.000	8.78	0.00	0.02	8.8	0.000
13.567	0.000	8.81	0.00	0.02	8.8	0.000
13.583	0.000	8.84	0.00	0.02	8.8	0.000
13.600	0.000	8.86	0.00	0.02	8.9	0.000
13.617	0.000	8.87	0.00	0.02	8.9	0.000
13.633	0.000	8.89	0.00	0.02	8.9	0.000
13.650	0.000	8.91	0.00	0.02	8.9	0.000
13.667	0.000	8.92	0.00	0.02	8.9	0.000
13.683	0.000	8.94	0.00	0.02	8.9	0.000
13.700	0.000	8.96	0.00	0.02	9.0	0.000
13.717	0.000	8.97	0.00	0.02	9.0	0.000
13.733	0.000	8.99	0.00	0.02	9.0	0.000
13.750	0.000	9.01	0.00	0.02	9.0	0.000
13.767	0.000	9.02	0.00	0.02	9.0	0.000
13.783	0.000	9.06	0.00	0.02	9.1	0.000
13.800	0.000	9.09	0.00	0.02	9.1	0.000
13.817	0.000	9.13	0.00	0.02	9.1	0.000
13.833	0.000	9.17	0.00	0.02	9.2	0.000
13.850	0.000	9.21	0.00	0.02	9.2	0.000
13.867	0.000	9.24	0.00	0.02	9.2	0.000
13.883	0.000	9.28	0.00	0.02	9.3	0.000
13.900	0.000	9.32	0.00	0.02	9.3	0.000
13.917	0.000	9.35	0.00	0.02	9.4	0.000
13.933	0.000	9.39	0.00	0.02	9.4	0.000
13.950	0.000	9.43	0.00	0.02	9.4	0.000
13.967	0.000	9.45	0.00	0.02	9.4	0.000
13.983	0.000	9.46	0.00	0.02	9.5	0.000
14.000	0.000	9.48	0.00	0.02	9.5	0.000
14.017	0.000	9.49	0.00	0.02	9.5	0.000
14.033	0.000	9.51	0.00	0.02	9.5	0.000
14.050	0.000	9.52	0.00	0.02	9.5	0.000
14.067	0.000	9.54	0.00	0.02	9.5	0.000
14.083	0.000	9.55	0.00	0.02	9.6	0.000
14.100	0.000	9.57	0.00	0.02	9.6	0.000

14.117	0.000	9.58	0.00	0.02	9.6	0.000
14.133	0.000	9.60	0.00	0.02	9.6	0.000
14.150	0.000	9.59	0.00	0.02	9.6	0.000
14.167	0.000	9.56	0.00	0.02	9.6	0.000
14.183	0.000	9.53	0.00	0.02	9.5	0.000
14.200	0.000	9.50	0.00	0.02	9.5	0.000
14.217	0.000	9.47	0.00	0.02	9.5	0.000
14.233	0.000	9.44	0.00	0.02	9.4	0.000
14.250	0.000	9.41	0.00	0.02	9.4	0.000
14.267	0.000	9.38	0.00	0.02	9.4	0.000
14.283	0.000	9.34	0.00	0.02	9.3	0.000
14.300	0.000	9.31	0.00	0.02	9.3	0.000
14.317	0.000	9.28	0.00	0.02	9.3	0.000
14.333	0.000	9.27	0.00	0.02	9.3	0.000
14.350	0.000	9.30	0.00	0.02	9.3	0.000
14.367	0.000	9.33	0.00	0.02	9.3	0.000
14.383	0.000	9.36	0.00	0.02	9.4	0.000
14.400	0.000	9.38	0.00	0.02	9.4	0.000
14.417	0.000	9.41	0.00	0.02	9.4	0.000
14.433	0.000	9.44	0.00	0.02	9.4	0.000
14.450	0.000	9.47	0.00	0.02	9.5	0.000
14.467	0.000	9.50	0.00	0.02	9.5	0.000
14.483	0.000	9.53	0.00	0.02	9.5	0.000
14.500	0.000	9.55	0.00	0.02	9.6	0.000
14.517	0.000	9.59	0.00	0.02	9.6	0.000
14.533	0.000	9.65	0.00	0.02	9.7	0.000
14.550	0.000	9.72	0.00	0.02	9.7	0.000
14.567	0.000	9.79	0.00	0.02	9.8	0.000
14.583	0.000	9.86	0.00	0.02	9.9	0.000
14.600	0.000	9.92	0.00	0.02	9.9	0.000
14.617	0.000	9.99	0.00	0.02	10.0	0.000
14.633	0.000	10.06	0.00	0.02	10.1	0.000
14.650	0.000	10.13	0.00	0.02	10.1	0.000
14.667	0.000	10.19	0.00	0.02	10.2	0.000
14.683	0.000	10.26	0.00	0.02	10.3	0.000
14.700	0.000	10.33	0.00	0.02	10.3	0.000
14.717	0.000	10.37	0.00	0.02	10.4	0.000
14.733	0.000	10.41	0.00	0.02	10.4	0.000
14.750	0.000	10.45	0.00	0.02	10.5	0.000
14.767	0.000	10.49	0.00	0.02	10.5	0.000
14.783	0.000	10.53	0.00	0.02	10.5	0.000
14.800	0.000	10.57	0.00	0.02	10.6	0.000
14.817	0.000	10.61	0.00	0.02	10.6	0.000
14.833	0.000	10.65	0.00	0.02	10.7	0.000
14.850	0.000	10.70	0.00	0.02	10.7	0.000
14.867	0.000	10.74	0.00	0.02	10.7	0.000
14.883	0.000	10.78	0.00	0.02	10.8	0.000
14.900	0.000	10.86	0.00	0.03	10.9	0.000
14.917	0.000	10.96	0.00	0.03	11.0	0.000
14.933	0.000	11.07	0.00	0.03	11.1	0.000
14.950	0.000	11.17	0.00	0.03	11.2	0.000
14.967	0.000	11.27	0.00	0.03	11.3	0.000
14.983	0.000	11.38	0.00	0.03	11.4	0.000
15.000	0.000	11.48	0.00	0.03	11.5	0.000
15.017	0.000	11.58	0.00	0.03	11.6	0.000
15.033	0.000	11.69	0.00	0.03	11.7	0.000
15.050	0.000	11.79	0.00	0.03	11.8	0.000
15.067	0.000	11.89	0.00	0.03	11.9	0.000
15.083	0.000	11.98	0.00	0.03	12.0	0.000
15.100	0.000	12.05	0.00	0.03	12.1	0.000
15.117	0.000	12.13	0.00	0.03	12.1	0.000
15.133	0.000	12.20	0.00	0.03	12.2	0.000
15.150	0.000	12.28	0.00	0.03	12.3	0.000
15.167	0.000	12.35	0.00	0.03	12.4	0.000
15.183	0.000	12.43	0.00	0.03	12.4	0.000
15.200	0.000	12.50	0.00	0.03	12.5	0.000
15.217	0.000	12.57	0.00	0.03	12.6	0.000
15.233	0.000	12.65	0.00	0.03	12.6	0.000
15.250	0.000	12.72	0.00	0.03	12.7	0.000
15.267	0.000	12.80	0.00	0.03	12.8	0.000
15.283	0.000	12.89	0.00	0.03	12.9	0.000
15.300	0.000	12.98	0.00	0.03	13.0	0.000
15.317	0.000	13.07	0.00	0.03	13.1	0.000
15.333	0.000	13.16	0.00	0.03	13.2	0.000
15.350	0.000	13.25	0.00	0.03	13.2	0.000
15.367	0.000	13.33	0.00	0.03	13.3	0.000
15.383	0.000	13.42	0.00	0.03	13.4	0.000
15.400	0.000	13.51	0.00	0.03	13.5	0.000
15.417	0.000	13.60	0.00	0.03	13.6	0.000

15.433	0.000	13.69	0.00	0.03	13.7	0.000
15.450	0.000	13.75	0.00	0.03	13.8	0.000
15.467	0.000	13.70	0.00	0.03	13.7	0.000
15.483	0.000	13.64	0.00	0.03	13.6	0.000
15.500	0.000	13.58	0.00	0.03	13.6	0.000
15.517	0.000	13.52	0.00	0.03	13.5	0.000
15.533	0.000	13.46	0.00	0.03	13.5	0.000
15.550	0.000	13.40	0.00	0.03	13.4	0.000
15.567	0.000	13.34	0.00	0.03	13.3	0.000
15.583	0.000	13.28	0.00	0.03	13.3	0.000
15.600	0.000	13.22	0.00	0.03	13.2	0.000
15.617	0.000	13.16	0.00	0.03	13.2	0.000
15.633	0.000	13.15	0.00	0.03	13.1	0.000
15.650	0.000	13.56	0.00	0.03	13.5	0.000
15.667	0.000	14.07	0.00	0.03	14.1	0.000
15.683	0.000	14.59	0.00	0.03	14.6	0.000
15.700	0.000	15.10	0.00	0.04	15.1	0.000
15.717	0.000	15.62	0.00	0.04	15.6	0.000
15.733	0.000	16.13	0.00	0.04	16.1	0.000
15.750	0.000	16.65	0.00	0.04	16.6	0.000
15.767	0.000	17.16	0.00	0.04	17.2	0.000
15.783	0.000	17.67	0.00	0.04	17.7	0.000
15.800	0.000	18.19	0.00	0.04	18.2	0.000
15.817	0.000	18.71	0.00	0.04	18.7	0.000
15.833	0.000	19.32	0.00	0.05	19.3	0.000
15.850	0.000	19.98	0.00	0.05	20.0	0.001
15.867	0.000	20.64	0.00	0.05	20.6	0.001
15.883	0.000	21.31	0.00	0.05	21.3	0.001
15.900	0.000	21.97	0.00	0.05	22.0	0.001
15.917	0.000	22.63	0.00	0.05	22.6	0.001
15.933	0.000	23.29	0.00	0.05	23.3	0.001
15.950	0.000	23.95	0.00	0.06	23.9	0.001
15.967	0.000	24.62	0.00	0.06	24.6	0.001
15.983	0.000	25.28	0.00	0.06	25.3	0.001
16.000	0.000	25.94	0.00	0.06	25.9	0.001
16.017	0.000	28.90	0.00	0.07	28.8	0.001
16.033	0.000	34.15	0.00	0.08	34.0	0.001
16.050	0.000	39.40	0.00	0.10	39.3	0.001
16.067	0.000	44.65	0.00	0.11	42.7	0.004
16.083	0.000	49.90	0.00	0.15	43.5	0.013
16.100	0.000	55.15	0.00	0.21	43.7	0.028
16.117	0.000	60.41	0.00	0.25	43.8	0.051
16.133	0.000	65.66	0.00	0.29	43.9	0.081
16.150	0.000	70.91	0.00	0.33	44.0	0.118
16.167	0.000	76.16	0.00	0.37	44.1	0.162
16.183	0.000	81.41	0.00	0.41	44.2	0.214
16.200	0.000	85.09	0.00	0.45	44.3	0.270
16.217	0.000	77.01	0.00	0.48	44.4	0.315
16.233	0.000	70.79	0.00	0.50	44.5	0.351
16.250	0.000	64.57	0.00	0.51	44.5	0.379
16.267	0.000	58.36	0.00	0.52	44.5	0.398
16.283	0.000	52.14	0.00	0.53	44.6	0.408
16.300	0.000	45.92	0.00	0.53	44.6	0.410
16.317	0.000	39.71	0.00	0.53	44.6	0.403
16.333	0.000	33.49	0.00	0.52	44.5	0.388
16.350	0.000	27.27	0.00	0.51	44.5	0.364
16.367	0.000	21.06	0.00	0.49	44.5	0.332
16.383	0.000	15.93	0.00	0.46	44.4	0.293
16.400	0.000	15.30	0.00	0.44	44.4	0.253
16.417	0.000	15.15	0.00	0.41	44.3	0.213
16.433	0.000	15.00	0.00	0.38	44.2	0.172
16.450	0.000	14.85	0.00	0.34	44.1	0.132
16.467	0.000	14.70	0.00	0.31	44.0	0.092
16.483	0.000	14.55	0.00	0.25	43.9	0.051
16.500	0.000	14.40	0.00	0.15	43.7	0.011
16.517	0.000	14.25	0.00	0.00	22.2	0.000
16.533	0.000	14.10	0.00	0.06	13.6	0.001
16.550	0.000	13.95	0.00	0.01	14.4	0.000
16.567	0.000	13.80	0.00	0.06	13.4	0.001
16.583	0.000	13.59	0.00	0.01	14.0	0.000
16.600	0.000	13.37	0.00	0.05	13.0	0.001
16.617	0.000	13.15	0.00	0.01	13.5	0.000
16.633	0.000	12.93	0.00	0.05	12.6	0.001
16.650	0.000	12.71	0.00	0.01	13.0	0.000
16.667	0.000	12.48	0.00	0.04	12.2	0.000
16.683	0.000	12.26	0.00	0.01	12.5	0.000
16.700	0.000	12.04	0.00	0.04	11.8	0.000
16.717	0.000	11.82	0.00	0.01	12.0	0.000
16.733	0.000	11.60	0.00	0.04	11.4	0.000



16.750	0.000	11.38	0.00	0.01	11.6	0.000
16.767	0.000	11.23	0.00	0.04	11.1	0.000
16.783	0.000	11.10	0.00	0.02	11.3	0.000
16.800	0.000	10.98	0.00	0.03	10.8	0.000
16.817	0.000	10.86	0.00	0.02	11.0	0.000
16.833	0.000	10.73	0.00	0.03	10.6	0.000
16.850	0.000	10.61	0.00	0.02	10.7	0.000
16.867	0.000	10.49	0.00	0.03	10.4	0.000
16.883	0.000	10.37	0.00	0.02	10.5	0.000
16.900	0.000	10.24	0.00	0.03	10.2	0.000
16.917	0.000	10.12	0.00	0.02	10.2	0.000
16.933	0.000	10.00	0.00	0.03	9.9	0.000
16.950	0.000	9.89	0.00	0.02	10.0	0.000
16.967	0.000	9.81	0.00	0.03	9.7	0.000
16.983	0.000	9.72	0.00	0.02	9.8	0.000
17.000	0.000	9.64	0.00	0.03	9.6	0.000
17.017	0.000	9.55	0.00	0.02	9.6	0.000
17.033	0.000	9.46	0.00	0.02	9.4	0.000
17.050	0.000	9.38	0.00	0.02	9.4	0.000
17.067	0.000	9.29	0.00	0.02	9.2	0.000
17.083	0.000	9.21	0.00	0.02	9.3	0.000
17.100	0.000	9.12	0.00	0.02	9.1	0.000
17.117	0.000	9.04	0.00	0.02	9.1	0.000
17.133	0.000	8.98	0.00	0.02	9.0	0.000
17.150	0.000	9.00	0.00	0.02	9.0	0.000
17.167	0.000	9.03	0.00	0.02	9.0	0.000
17.183	0.000	9.05	0.00	0.02	9.1	0.000
17.200	0.000	9.07	0.00	0.02	9.0	0.000
17.217	0.000	9.09	0.00	0.02	9.1	0.000
17.233	0.000	9.11	0.00	0.02	9.1	0.000
17.250	0.000	9.14	0.00	0.02	9.2	0.000
17.267	0.000	9.16	0.00	0.02	9.1	0.000
17.283	0.000	9.18	0.00	0.02	9.2	0.000
17.300	0.000	9.20	0.00	0.02	9.2	0.000
17.317	0.000	9.21	0.00	0.02	9.2	0.000
17.333	0.000	9.17	0.00	0.02	9.2	0.000
17.350	0.000	9.12	0.00	0.02	9.1	0.000
17.367	0.000	9.07	0.00	0.02	9.1	0.000
17.383	0.000	9.02	0.00	0.02	9.0	0.000
17.400	0.000	8.97	0.00	0.02	9.0	0.000
17.417	0.000	8.92	0.00	0.02	8.9	0.000
17.433	0.000	8.87	0.00	0.02	8.9	0.000
17.450	0.000	8.82	0.00	0.02	8.8	0.000
17.467	0.000	8.77	0.00	0.02	8.8	0.000
17.483	0.000	8.72	0.00	0.02	8.7	0.000
17.500	0.000	8.67	0.00	0.02	8.7	0.000
17.517	0.000	8.63	0.00	0.02	8.6	0.000
17.533	0.000	8.59	0.00	0.02	8.6	0.000
17.550	0.000	8.55	0.00	0.02	8.6	0.000
17.567	0.000	8.51	0.00	0.02	8.5	0.000
17.583	0.000	8.47	0.00	0.02	8.5	0.000
17.600	0.000	8.42	0.00	0.02	8.4	0.000
17.617	0.000	8.38	0.00	0.02	8.4	0.000
17.633	0.000	8.34	0.00	0.02	8.3	0.000
17.650	0.000	8.30	0.00	0.02	8.3	0.000
17.667	0.000	8.26	0.00	0.02	8.3	0.000
17.683	0.000	8.22	0.00	0.02	8.2	0.000
17.700	0.000	8.18	0.00	0.02	8.2	0.000
17.717	0.000	8.15	0.00	0.02	8.2	0.000
17.733	0.000	8.12	0.00	0.02	8.1	0.000
17.750	0.000	8.08	0.00	0.02	8.1	0.000
17.767	0.000	8.05	0.00	0.02	8.0	0.000
17.783	0.000	8.01	0.00	0.02	8.0	0.000
17.800	0.000	7.98	0.00	0.02	8.0	0.000
17.817	0.000	7.94	0.00	0.02	7.9	0.000
17.833	0.000	7.91	0.00	0.02	7.9	0.000
17.850	0.000	7.88	0.00	0.02	7.9	0.000
17.867	0.000	7.84	0.00	0.02	7.8	0.000
17.883	0.000	7.81	0.00	0.02	7.8	0.000
17.900	0.000	7.78	0.00	0.02	7.8	0.000
17.917	0.000	7.75	0.00	0.02	7.8	0.000
17.933	0.000	7.72	0.00	0.02	7.7	0.000
17.950	0.000	7.69	0.00	0.02	7.7	0.000
17.967	0.000	7.66	0.00	0.02	7.7	0.000
17.983	0.000	7.63	0.00	0.02	7.6	0.000
18.000	0.000	7.60	0.00	0.02	7.6	0.000
18.017	0.000	7.57	0.00	0.02	7.6	0.000
18.033	0.000	7.55	0.00	0.02	7.5	0.000
18.050	0.000	7.52	0.00	0.02	7.5	0.000

18.067	0.000	7.48	0.00	0.02	7.5	0.000
18.083	0.000	7.43	0.00	0.02	7.4	0.000
18.100	0.000	7.38	0.00	0.02	7.4	0.000
18.117	0.000	7.33	0.00	0.02	7.3	0.000
18.133	0.000	7.29	0.00	0.02	7.3	0.000
18.150	0.000	7.24	0.00	0.02	7.2	0.000
18.167	0.000	7.19	0.00	0.02	7.2	0.000
18.183	0.000	7.14	0.00	0.02	7.1	0.000
18.200	0.000	7.09	0.00	0.02	7.1	0.000
18.217	0.000	7.04	0.00	0.02	7.0	0.000
18.233	0.000	6.99	0.00	0.02	7.0	0.000
18.250	0.000	6.95	0.00	0.02	6.9	0.000
18.267	0.000	6.92	0.00	0.02	6.9	0.000
18.283	0.000	6.90	0.00	0.02	6.9	0.000
18.300	0.000	6.88	0.00	0.02	6.9	0.000
18.317	0.000	6.86	0.00	0.02	6.9	0.000
18.333	0.000	6.83	0.00	0.02	6.8	0.000
18.350	0.000	6.81	0.00	0.02	6.8	0.000
18.367	0.000	6.79	0.00	0.02	6.8	0.000
18.383	0.000	6.76	0.00	0.02	6.8	0.000
18.400	0.000	6.74	0.00	0.02	6.7	0.000
18.417	0.000	6.72	0.00	0.02	6.7	0.000
18.433	0.000	6.70	0.00	0.02	6.7	0.000
18.450	0.000	6.68	0.00	0.02	6.7	0.000
18.467	0.000	6.66	0.00	0.02	6.7	0.000
18.483	0.000	6.64	0.00	0.02	6.6	0.000
18.500	0.000	6.62	0.00	0.02	6.6	0.000
18.517	0.000	6.60	0.00	0.02	6.6	0.000
18.533	0.000	6.57	0.00	0.02	6.6	0.000
18.550	0.000	6.55	0.00	0.02	6.6	0.000
18.567	0.000	6.53	0.00	0.02	6.5	0.000
18.583	0.000	6.51	0.00	0.01	6.5	0.000
18.600	0.000	6.49	0.00	0.01	6.5	0.000
18.617	0.000	6.47	0.00	0.01	6.5	0.000
18.633	0.000	6.45	0.00	0.01	6.5	0.000
18.650	0.000	6.44	0.00	0.01	6.4	0.000
18.667	0.000	6.42	0.00	0.01	6.4	0.000
18.683	0.000	6.40	0.00	0.01	6.4	0.000
18.700	0.000	6.38	0.00	0.01	6.4	0.000
18.717	0.000	6.36	0.00	0.01	6.4	0.000
18.733	0.000	6.35	0.00	0.01	6.3	0.000
18.750	0.000	6.33	0.00	0.01	6.3	0.000
18.767	0.000	6.31	0.00	0.01	6.3	0.000
18.783	0.000	6.29	0.00	0.01	6.3	0.000
18.800	0.000	6.27	0.00	0.01	6.3	0.000
18.817	0.000	6.26	0.00	0.01	6.3	0.000
18.833	0.000	6.24	0.00	0.01	6.2	0.000
18.850	0.000	6.22	0.00	0.01	6.2	0.000
18.867	0.000	6.21	0.00	0.01	6.2	0.000
18.883	0.000	6.19	0.00	0.01	6.2	0.000
18.900	0.000	6.17	0.00	0.01	6.2	0.000
18.917	0.000	6.16	0.00	0.01	6.2	0.000
18.933	0.000	6.14	0.00	0.01	6.1	0.000
18.950	0.000	6.13	0.00	0.01	6.1	0.000
18.967	0.000	6.11	0.00	0.01	6.1	0.000
18.983	0.000	6.09	0.00	0.01	6.1	0.000
19.000	0.000	6.08	0.00	0.01	6.1	0.000
19.017	0.000	6.06	0.00	0.01	6.1	0.000
19.033	0.000	6.05	0.00	0.01	6.0	0.000
19.050	0.000	6.03	0.00	0.01	6.0	0.000
19.067	0.000	6.02	0.00	0.01	6.0	0.000
19.083	0.000	6.00	0.00	0.01	6.0	0.000
19.100	0.000	5.99	0.00	0.01	6.0	0.000
19.117	0.000	5.97	0.00	0.01	6.0	0.000
19.133	0.000	5.96	0.00	0.01	6.0	0.000
19.150	0.000	5.94	0.00	0.01	5.9	0.000
19.167	0.000	5.93	0.00	0.01	5.9	0.000
19.183	0.000	5.91	0.00	0.01	5.9	0.000
19.200	0.000	5.90	0.00	0.01	5.9	0.000
19.217	0.000	5.89	0.00	0.01	5.9	0.000
19.233	0.000	5.87	0.00	0.01	5.9	0.000
19.250	0.000	5.86	0.00	0.01	5.9	0.000
19.267	0.000	5.84	0.00	0.01	5.8	0.000
19.283	0.000	5.83	0.00	0.01	5.8	0.000
19.300	0.000	5.82	0.00	0.01	5.8	0.000
19.317	0.000	5.80	0.00	0.01	5.8	0.000
19.333	0.000	5.79	0.00	0.01	5.8	0.000
19.350	0.000	5.78	0.00	0.01	5.8	0.000
19.367	0.000	5.76	0.00	0.01	5.8	0.000

19.383	0.000	5.75	0.00	0.01	5.8	0.000
19.400	0.000	5.74	0.00	0.01	5.7	0.000
19.417	0.000	5.73	0.00	0.01	5.7	0.000
19.433	0.000	5.71	0.00	0.01	5.7	0.000
19.450	0.000	5.70	0.00	0.01	5.7	0.000
19.467	0.000	5.69	0.00	0.01	5.7	0.000
19.483	0.000	5.68	0.00	0.01	5.7	0.000
19.500	0.000	5.66	0.00	0.01	5.7	0.000
19.517	0.000	5.65	0.00	0.01	5.7	0.000
19.533	0.000	5.64	0.00	0.01	5.6	0.000
19.550	0.000	5.63	0.00	0.01	5.6	0.000
19.567	0.000	5.61	0.00	0.01	5.6	0.000
19.583	0.000	5.60	0.00	0.01	5.6	0.000
19.600	0.000	5.59	0.00	0.01	5.6	0.000
19.617	0.000	5.58	0.00	0.01	5.6	0.000
19.633	0.000	5.57	0.00	0.01	5.6	0.000
19.650	0.000	5.56	0.00	0.01	5.6	0.000
19.667	0.000	5.54	0.00	0.01	5.5	0.000
19.683	0.000	5.53	0.00	0.01	5.5	0.000
19.700	0.000	5.52	0.00	0.01	5.5	0.000
19.717	0.000	5.51	0.00	0.01	5.5	0.000
19.733	0.000	5.50	0.00	0.01	5.5	0.000
19.750	0.000	5.49	0.00	0.01	5.5	0.000
19.767	0.000	5.48	0.00	0.01	5.5	0.000
19.783	0.000	5.46	0.00	0.01	5.5	0.000
19.800	0.000	5.45	0.00	0.01	5.5	0.000
19.817	0.000	5.44	0.00	0.01	5.4	0.000
19.833	0.000	5.43	0.00	0.01	5.4	0.000
19.850	0.000	5.42	0.00	0.01	5.4	0.000
19.867	0.000	5.41	0.00	0.01	5.4	0.000
19.883	0.000	5.40	0.00	0.01	5.4	0.000
19.900	0.000	5.39	0.00	0.01	5.4	0.000
19.917	0.000	5.38	0.00	0.01	5.4	0.000
19.933	0.000	5.37	0.00	0.01	5.4	0.000
19.950	0.000	5.36	0.00	0.01	5.4	0.000
19.967	0.000	5.35	0.00	0.01	5.3	0.000
19.983	0.000	5.34	0.00	0.01	5.3	0.000
20.000	0.000	5.33	0.00	0.01	5.3	0.000
20.017	0.000	5.32	0.00	0.01	5.3	0.000
20.033	0.000	5.31	0.00	0.01	5.3	0.000
20.050	0.000	5.30	0.00	0.01	5.3	0.000
20.067	0.000	5.29	0.00	0.01	5.3	0.000
20.083	0.000	5.28	0.00	0.01	5.3	0.000
20.100	0.000	5.27	0.00	0.01	5.3	0.000
20.117	0.000	5.26	0.00	0.01	5.3	0.000
20.133	0.000	5.25	0.00	0.01	5.2	0.000
20.150	0.000	5.24	0.00	0.01	5.2	0.000
20.167	0.000	5.23	0.00	0.01	5.2	0.000
20.183	0.000	5.22	0.00	0.01	5.2	0.000
20.200	0.000	5.21	0.00	0.01	5.2	0.000
20.217	0.000	5.20	0.00	0.01	5.2	0.000
20.233	0.000	5.19	0.00	0.01	5.2	0.000
20.250	0.000	5.18	0.00	0.01	5.2	0.000
20.267	0.000	5.17	0.00	0.01	5.2	0.000
20.283	0.000	5.16	0.00	0.01	5.2	0.000
20.300	0.000	5.16	0.00	0.01	5.2	0.000
20.317	0.000	5.15	0.00	0.01	5.1	0.000
20.333	0.000	5.14	0.00	0.01	5.1	0.000
20.350	0.000	5.13	0.00	0.01	5.1	0.000
20.367	0.000	5.12	0.00	0.01	5.1	0.000
20.383	0.000	5.11	0.00	0.01	5.1	0.000
20.400	0.000	5.10	0.00	0.01	5.1	0.000
20.417	0.000	5.09	0.00	0.01	5.1	0.000
20.433	0.000	5.09	0.00	0.01	5.1	0.000
20.450	0.000	5.08	0.00	0.01	5.1	0.000
20.467	0.000	5.07	0.00	0.01	5.1	0.000
20.483	0.000	5.06	0.00	0.01	5.1	0.000
20.500	0.000	5.05	0.00	0.01	5.1	0.000
20.517	0.000	5.04	0.00	0.01	5.0	0.000
20.533	0.000	5.03	0.00	0.01	5.0	0.000
20.550	0.000	5.03	0.00	0.01	5.0	0.000
20.567	0.000	5.02	0.00	0.01	5.0	0.000
20.583	0.000	5.01	0.00	0.01	5.0	0.000
20.600	0.000	5.00	0.00	0.01	5.0	0.000
20.617	0.000	4.99	0.00	0.01	5.0	0.000
20.633	0.000	4.98	0.00	0.01	5.0	0.000
20.650	0.000	4.98	0.00	0.01	5.0	0.000
20.667	0.000	4.97	0.00	0.01	5.0	0.000
20.683	0.000	4.96	0.00	0.01	5.0	0.000

20.700	0.000	4.95	0.00	0.01	5.0	0.000
20.717	0.000	4.94	0.00	0.01	4.9	0.000
20.733	0.000	4.94	0.00	0.01	4.9	0.000
20.750	0.000	4.93	0.00	0.01	4.9	0.000
20.767	0.000	4.92	0.00	0.01	4.9	0.000
20.783	0.000	4.91	0.00	0.01	4.9	0.000
20.800	0.000	4.91	0.00	0.01	4.9	0.000
20.817	0.000	4.90	0.00	0.01	4.9	0.000
20.833	0.000	4.89	0.00	0.01	4.9	0.000
20.850	0.000	4.88	0.00	0.01	4.9	0.000
20.867	0.000	4.88	0.00	0.01	4.9	0.000
20.883	0.000	4.87	0.00	0.01	4.9	0.000
20.900	0.000	4.86	0.00	0.01	4.9	0.000
20.917	0.000	4.85	0.00	0.01	4.9	0.000
20.933	0.000	4.85	0.00	0.01	4.8	0.000
20.950	0.000	4.84	0.00	0.01	4.8	0.000
20.967	0.000	4.83	0.00	0.01	4.8	0.000
20.983	0.000	4.82	0.00	0.01	4.8	0.000
21.000	0.000	4.82	0.00	0.01	4.8	0.000
21.017	0.000	4.81	0.00	0.01	4.8	0.000
21.033	0.000	4.80	0.00	0.01	4.8	0.000
21.050	0.000	4.79	0.00	0.01	4.8	0.000
21.067	0.000	4.79	0.00	0.01	4.8	0.000
21.083	0.000	4.78	0.00	0.01	4.8	0.000
21.100	0.000	4.77	0.00	0.01	4.8	0.000
21.117	0.000	4.77	0.00	0.01	4.8	0.000
21.133	0.000	4.76	0.00	0.01	4.8	0.000
21.150	0.000	4.75	0.00	0.01	4.8	0.000
21.167	0.000	4.75	0.00	0.01	4.7	0.000
21.183	0.000	4.74	0.00	0.01	4.7	0.000
21.200	0.000	4.73	0.00	0.01	4.7	0.000
21.217	0.000	4.73	0.00	0.01	4.7	0.000
21.233	0.000	4.72	0.00	0.01	4.7	0.000
21.250	0.000	4.71	0.00	0.01	4.7	0.000
21.267	0.000	4.70	0.00	0.01	4.7	0.000
21.283	0.000	4.70	0.00	0.01	4.7	0.000
21.300	0.000	4.69	0.00	0.01	4.7	0.000
21.317	0.000	4.69	0.00	0.01	4.7	0.000
21.333	0.000	4.68	0.00	0.01	4.7	0.000
21.350	0.000	4.67	0.00	0.01	4.7	0.000
21.367	0.000	4.67	0.00	0.01	4.7	0.000
21.383	0.000	4.66	0.00	0.01	4.7	0.000
21.400	0.000	4.65	0.00	0.01	4.7	0.000
21.417	0.000	4.65	0.00	0.01	4.6	0.000
21.433	0.000	4.64	0.00	0.01	4.6	0.000
21.450	0.000	4.63	0.00	0.01	4.6	0.000
21.467	0.000	4.63	0.00	0.01	4.6	0.000
21.483	0.000	4.62	0.00	0.01	4.6	0.000
21.500	0.000	4.61	0.00	0.01	4.6	0.000
21.517	0.000	4.61	0.00	0.01	4.6	0.000
21.533	0.000	4.60	0.00	0.01	4.6	0.000
21.550	0.000	4.60	0.00	0.01	4.6	0.000
21.567	0.000	4.59	0.00	0.01	4.6	0.000
21.583	0.000	4.58	0.00	0.01	4.6	0.000
21.600	0.000	4.58	0.00	0.01	4.6	0.000
21.617	0.000	4.57	0.00	0.01	4.6	0.000
21.633	0.000	4.56	0.00	0.01	4.6	0.000
21.650	0.000	4.56	0.00	0.01	4.6	0.000
21.667	0.000	4.55	0.00	0.01	4.6	0.000
21.683	0.000	4.55	0.00	0.01	4.5	0.000
21.700	0.000	4.54	0.00	0.01	4.5	0.000
21.717	0.000	4.54	0.00	0.01	4.5	0.000
21.733	0.000	4.53	0.00	0.01	4.5	0.000
21.750	0.000	4.52	0.00	0.01	4.5	0.000
21.767	0.000	4.52	0.00	0.01	4.5	0.000
21.783	0.000	4.51	0.00	0.01	4.5	0.000
21.800	0.000	4.51	0.00	0.01	4.5	0.000
21.817	0.000	4.50	0.00	0.01	4.5	0.000
21.833	0.000	4.49	0.00	0.01	4.5	0.000
21.850	0.000	4.49	0.00	0.01	4.5	0.000
21.867	0.000	4.48	0.00	0.01	4.5	0.000
21.883	0.000	4.48	0.00	0.01	4.5	0.000
21.900	0.000	4.47	0.00	0.01	4.5	0.000
21.917	0.000	4.47	0.00	0.01	4.5	0.000
21.933	0.000	4.46	0.00	0.01	4.5	0.000
21.950	0.000	4.45	0.00	0.01	4.5	0.000
21.967	0.000	4.45	0.00	0.01	4.4	0.000
21.983	0.000	4.44	0.00	0.01	4.4	0.000
22.000	0.000	4.44	0.00	0.01	4.4	0.000

22.017	0.000	4.43	0.00	0.01	4.4	0.000
22.033	0.000	4.43	0.00	0.01	4.4	0.000
22.050	0.000	4.42	0.00	0.01	4.4	0.000
22.067	0.000	4.42	0.00	0.01	4.4	0.000
22.083	0.000	4.41	0.00	0.01	4.4	0.000
22.100	0.000	4.41	0.00	0.01	4.4	0.000
22.117	0.000	4.40	0.00	0.01	4.4	0.000
22.133	0.000	4.39	0.00	0.01	4.4	0.000
22.150	0.000	4.39	0.00	0.01	4.4	0.000
22.167	0.000	4.38	0.00	0.01	4.4	0.000
22.183	0.000	4.38	0.00	0.01	4.4	0.000
22.200	0.000	4.37	0.00	0.01	4.4	0.000
22.216	0.000	4.37	0.00	0.01	4.4	0.000
22.233	0.000	4.36	0.00	0.01	4.4	0.000
22.250	0.000	4.36	0.00	0.01	4.4	0.000
22.266	0.000	4.35	0.00	0.01	4.4	0.000
22.283	0.000	4.35	0.00	0.01	4.3	0.000
22.300	0.000	4.34	0.00	0.01	4.3	0.000
22.316	0.000	4.34	0.00	0.01	4.3	0.000
22.333	0.000	4.33	0.00	0.01	4.3	0.000
22.350	0.000	4.33	0.00	0.01	4.3	0.000
22.366	0.000	4.32	0.00	0.01	4.3	0.000
22.383	0.000	4.32	0.00	0.01	4.3	0.000
22.400	0.000	4.31	0.00	0.01	4.3	0.000
22.416	0.000	4.31	0.00	0.01	4.3	0.000
22.433	0.000	4.30	0.00	0.01	4.3	0.000
22.450	0.000	4.30	0.00	0.01	4.3	0.000
22.466	0.000	4.29	0.00	0.01	4.3	0.000
22.483	0.000	4.29	0.00	0.01	4.3	0.000
22.500	0.000	4.28	0.00	0.01	4.3	0.000
22.516	0.000	4.28	0.00	0.01	4.3	0.000
22.533	0.000	4.27	0.00	0.01	4.3	0.000
22.550	0.000	4.27	0.00	0.01	4.3	0.000
22.566	0.000	4.26	0.00	0.01	4.3	0.000
22.583	0.000	4.26	0.00	0.01	4.3	0.000
22.600	0.000	4.25	0.00	0.01	4.3	0.000
22.616	0.000	4.25	0.00	0.01	4.2	0.000
22.633	0.000	4.24	0.00	0.01	4.2	0.000
22.650	0.000	4.24	0.00	0.01	4.2	0.000
22.666	0.000	4.23	0.00	0.01	4.2	0.000
22.683	0.000	4.23	0.00	0.01	4.2	0.000
22.700	0.000	4.22	0.00	0.01	4.2	0.000
22.716	0.000	4.22	0.00	0.01	4.2	0.000
22.733	0.000	4.21	0.00	0.01	4.2	0.000
22.750	0.000	4.21	0.00	0.01	4.2	0.000
22.766	0.000	4.21	0.00	0.01	4.2	0.000
22.783	0.000	4.20	0.00	0.01	4.2	0.000
22.800	0.000	4.20	0.00	0.01	4.2	0.000
22.816	0.000	4.19	0.00	0.01	4.2	0.000
22.833	0.000	4.19	0.00	0.01	4.2	0.000
22.850	0.000	4.18	0.00	0.01	4.2	0.000
22.866	0.000	4.18	0.00	0.01	4.2	0.000
22.883	0.000	4.17	0.00	0.01	4.2	0.000
22.900	0.000	4.17	0.00	0.01	4.2	0.000
22.916	0.000	4.16	0.00	0.01	4.2	0.000
22.933	0.000	4.16	0.00	0.01	4.2	0.000
22.950	0.000	4.16	0.00	0.01	4.2	0.000
22.966	0.000	4.15	0.00	0.01	4.2	0.000
22.983	0.000	4.15	0.00	0.01	4.1	0.000
23.000	0.000	4.14	0.00	0.01	4.1	0.000
23.016	0.000	4.14	0.00	0.01	4.1	0.000
23.033	0.000	4.13	0.00	0.01	4.1	0.000
23.050	0.000	4.13	0.00	0.01	4.1	0.000
23.066	0.000	4.12	0.00	0.01	4.1	0.000
23.083	0.000	4.12	0.00	0.01	4.1	0.000
23.100	0.000	4.12	0.00	0.01	4.1	0.000
23.116	0.000	4.11	0.00	0.01	4.1	0.000
23.133	0.000	4.11	0.00	0.01	4.1	0.000
23.150	0.000	4.10	0.00	0.01	4.1	0.000
23.166	0.000	4.10	0.00	0.01	4.1	0.000
23.183	0.000	4.09	0.00	0.01	4.1	0.000
23.200	0.000	4.09	0.00	0.01	4.1	0.000
23.216	0.000	4.09	0.00	0.01	4.1	0.000
23.233	0.000	4.08	0.00	0.01	4.1	0.000
23.250	0.000	4.08	0.00	0.01	4.1	0.000
23.266	0.000	4.07	0.00	0.01	4.1	0.000
23.283	0.000	4.07	0.00	0.01	4.1	0.000
23.300	0.000	4.07	0.00	0.01	4.1	0.000
23.316	0.000	4.06	0.00	0.01	4.1	0.000

23.333	0.000	4.06	0.00	0.01	4.1	0.000
23.350	0.000	4.05	0.00	0.01	4.1	0.000
23.366	0.000	4.05	0.00	0.01	4.0	0.000
23.383	0.000	4.04	0.00	0.01	4.0	0.000
23.400	0.000	4.04	0.00	0.01	4.0	0.000
23.416	0.000	4.04	0.00	0.01	4.0	0.000
23.433	0.000	4.03	0.00	0.01	4.0	0.000
23.450	0.000	4.03	0.00	0.01	4.0	0.000
23.466	0.000	4.02	0.00	0.01	4.0	0.000
23.483	0.000	4.02	0.00	0.01	4.0	0.000
23.500	0.000	4.02	0.00	0.01	4.0	0.000
23.516	0.000	4.01	0.00	0.01	4.0	0.000
23.533	0.000	4.01	0.00	0.01	4.0	0.000
23.550	0.000	4.00	0.00	0.01	4.0	0.000
23.566	0.000	4.00	0.00	0.01	4.0	0.000
23.583	0.000	4.00	0.00	0.01	4.0	0.000
23.600	0.000	3.99	0.00	0.01	4.0	0.000
23.616	0.000	3.99	0.00	0.01	4.0	0.000
23.633	0.000	3.99	0.00	0.01	4.0	0.000
23.650	0.000	3.98	0.00	0.01	4.0	0.000
23.666	0.000	3.98	0.00	0.01	4.0	0.000
23.683	0.000	3.97	0.00	0.01	4.0	0.000
23.700	0.000	3.97	0.00	0.01	4.0	0.000
23.716	0.000	3.97	0.00	0.01	4.0	0.000
23.733	0.000	3.96	0.00	0.01	4.0	0.000
23.750	0.000	3.96	0.00	0.01	4.0	0.000
23.766	0.000	3.95	0.00	0.01	4.0	0.000
23.783	0.000	3.95	0.00	0.01	4.0	0.000
23.800	0.000	3.95	0.00	0.01	3.9	0.000
23.816	0.000	3.94	0.00	0.01	3.9	0.000
23.833	0.000	3.94	0.00	0.01	3.9	0.000
23.850	0.000	3.94	0.00	0.01	3.9	0.000
23.866	0.000	3.93	0.00	0.01	3.9	0.000
23.883	0.000	3.93	0.00	0.01	3.9	0.000
23.900	0.000	3.92	0.00	0.01	3.9	0.000
23.916	0.000	3.92	0.00	0.01	3.9	0.000
23.933	0.000	3.92	0.00	0.01	3.9	0.000
23.950	0.000	3.91	0.00	0.01	3.9	0.000
23.966	0.000	3.91	0.00	0.01	3.9	0.000
23.983	0.000	3.91	0.00	0.01	3.9	0.000
24.000	0.000	3.90	0.00	0.01	3.9	0.000
24.016	0.000	3.90	0.00	0.01	3.9	0.000
24.033	0.000	3.87	0.00	0.01	3.9	0.000
24.050	0.000	3.58	0.00	0.01	3.6	0.000
24.066	0.000	3.23	0.00	0.01	3.2	0.000
24.083	0.000	2.89	0.00	0.01	2.9	0.000
24.100	0.000	2.54	0.00	0.01	2.5	0.000
24.116	0.000	2.19	0.00	0.00	2.2	0.000
24.133	0.000	1.84	0.00	0.00	1.8	0.000
24.150	0.000	1.50	0.00	0.00	1.5	0.000
24.166	0.000	1.15	0.00	0.00	1.2	0.000
24.183	0.000	0.80	0.00	0.00	0.8	0.000
24.200	0.000	0.45	0.00	0.00	0.5	0.000
24.216	0.000	0.00	0.00	0.00	0.2	0.000
24.233	0.000	0.00	0.00	0.00	0.0	0.000
24.250	0.000	0.00	0.00	0.00	0.0	0.000
24.266	0.000	0.00	0.00	0.00	0.0	0.000
24.283	0.000	0.00	0.00	0.00	0.0	0.000
24.300	0.000	0.00	0.00	0.00	0.0	0.000
24.316	0.000	0.00	0.00	0.00	0.0	0.000
24.333	0.000	0.00	0.00	0.00	0.0	0.000
24.350	0.000	0.00	0.00	0.00	0.0	0.000
24.366	0.000	0.00	0.00	0.00	0.0	0.000
24.383	0.000	0.00	0.00	0.00	0.0	0.000
24.400	0.000	0.00	0.00	0.00	0.0	0.000
24.416	0.000	0.00	0.00	0.00	0.0	0.000
24.433	0.000	0.00	0.00	0.00	0.0	0.000
24.450	0.000	0.00	0.00	0.00	0.0	0.000
24.466	0.000	0.00	0.00	0.00	0.0	0.000
24.483	0.000	0.00	0.00	0.00	0.0	0.000
24.500	0.000	0.00	0.00	0.00	0.0	0.000
24.516	0.000	0.00	0.00	0.00	0.0	0.000
24.533	0.000	0.00	0.00	0.00	0.0	0.000
24.550	0.000	0.00	0.00	0.00	0.0	0.000
24.566	0.000	0.00	0.00	0.00	0.0	0.000
24.583	0.000	0.00	0.00	0.00	0.0	0.000
24.600	0.000	0.00	0.00	0.00	0.0	0.000
24.616	0.000	0.00	0.00	0.00	0.0	0.000
24.633	0.000	0.00	0.00	0.00	0.0	0.000

24.650	0.000	0.00	0.00	0.00	0.0	0.000
24.666	0.000	0.00	0.00	0.00	0.0	0.000
24.683	0.000	0.00	0.00	0.00	0.0	0.000
24.700	0.000	0.00	0.00	0.00	0.0	0.000
24.716	0.000	0.00	0.00	0.00	0.0	0.000
24.733	0.000	0.00	0.00	0.00	0.0	0.000
24.750	0.000	0.00	0.00	0.00	0.0	0.000
24.766	0.000	0.00	0.00	0.00	0.0	0.000
24.783	0.000	0.00	0.00	0.00	0.0	0.000
24.800	0.000	0.00	0.00	0.00	0.0	0.000
24.816	0.000	0.00	0.00	0.00	0.0	0.000
24.833	0.000	0.00	0.00	0.00	0.0	0.000
24.850	0.000	0.00	0.00	0.00	0.0	0.000
24.866	0.000	0.00	0.00	0.00	0.0	0.000
24.883	0.000	0.00	0.00	0.00	0.0	0.000
24.900	0.000	0.00	0.00	0.00	0.0	0.000
24.916	0.000	0.00	0.00	0.00	0.0	0.000
24.933	0.000	0.00	0.00	0.00	0.0	0.000
24.950	0.000	0.00	0.00	0.00	0.0	0.000
24.966	0.000	0.00	0.00	0.00	0.0	0.000
24.983	0.000	0.00	0.00	0.00	0.0	0.000
25.000	0.000	0.00	0.00	0.00	0.0	0.000
25.016	0.000	0.00	0.00	0.00	0.0	0.000
25.033	0.000	0.00	0.00	0.00	0.0	0.000
25.050	0.000	0.00	0.00	0.00	0.0	0.000
25.066	0.000	0.00	0.00	0.00	0.0	0.000
25.083	0.000	0.00	0.00	0.00	0.0	0.000
25.100	0.000	0.00	0.00	0.00	0.0	0.000
25.116	0.000	0.00	0.00	0.00	0.0	0.000
25.133	0.000	0.00	0.00	0.00	0.0	0.000
25.150	0.000	0.00	0.00	0.00	0.0	0.000
25.166	0.000	0.00	0.00	0.00	0.0	0.000
25.183	0.000	0.00	0.00	0.00	0.0	0.000
25.200	0.000	0.00	0.00	0.00	0.0	0.000
25.216	0.000	0.00	0.00	0.00	0.0	0.000
25.233	0.000	0.00	0.00	0.00	0.0	0.000
25.250	0.000	0.00	0.00	0.00	0.0	0.000
25.266	0.000	0.00	0.00	0.00	0.0	0.000
25.283	0.000	0.00	0.00	0.00	0.0	0.000
25.300	0.000	0.00	0.00	0.00	0.0	0.000
25.316	0.000	0.00	0.00	0.00	0.0	0.000
25.333	0.000	0.00	0.00	0.00	0.0	0.000
25.350	0.000	0.00	0.00	0.00	0.0	0.000
25.366	0.000	0.00	0.00	0.00	0.0	0.000
25.383	0.000	0.00	0.00	0.00	0.0	0.000
25.400	0.000	0.00	0.00	0.00	0.0	0.000
25.416	0.000	0.00	0.00	0.00	0.0	0.000
25.433	0.000	0.00	0.00	0.00	0.0	0.000
25.450	0.000	0.00	0.00	0.00	0.0	0.000
25.466	0.000	0.00	0.00	0.00	0.0	0.000
25.483	0.000	0.00	0.00	0.00	0.0	0.000
25.500	0.000	0.00	0.00	0.00	0.0	0.000
25.516	0.000	0.00	0.00	0.00	0.0	0.000
25.533	0.000	0.00	0.00	0.00	0.0	0.000
25.550	0.000	0.00	0.00	0.00	0.0	0.000
25.566	0.000	0.00	0.00	0.00	0.0	0.000
25.583	0.000	0.00	0.00	0.00	0.0	0.000
25.600	0.000	0.00	0.00	0.00	0.0	0.000
25.616	0.000	0.00	0.00	0.00	0.0	0.000
25.633	0.000	0.00	0.00	0.00	0.0	0.000
25.650	0.000	0.00	0.00	0.00	0.0	0.000
25.666	0.000	0.00	0.00	0.00	0.0	0.000
25.683	0.000	0.00	0.00	0.00	0.0	0.000
25.700	0.000	0.00	0.00	0.00	0.0	0.000
25.716	0.000	0.00	0.00	0.00	0.0	0.000
25.733	0.000	0.00	0.00	0.00	0.0	0.000
25.750	0.000	0.00	0.00	0.00	0.0	0.000
25.766	0.000	0.00	0.00	0.00	0.0	0.000
25.783	0.000	0.00	0.00	0.00	0.0	0.000
25.800	0.000	0.00	0.00	0.00	0.0	0.000
25.816	0.000	0.00	0.00	0.00	0.0	0.000
25.833	0.000	0.00	0.00	0.00	0.0	0.000
25.850	0.000	0.00	0.00	0.00	0.0	0.000
25.866	0.000	0.00	0.00	0.00	0.0	0.000
25.883	0.000	0.00	0.00	0.00	0.0	0.000
25.900	0.000	0.00	0.00	0.00	0.0	0.000
25.916	0.000	0.00	0.00	0.00	0.0	0.000
25.933	0.000	0.00	0.00	0.00	0.0	0.000
25.950	0.000	0.00	0.00	0.00	0.0	0.000

25.966	0.000	0.00	0.00	0.00	0.0	0.000
25.983	0.000	0.00	0.00	0.00	0.0	0.000
26.000	0.000	0.00	0.00	0.00	0.0	0.000
26.016	0.000	0.00	0.00	0.00	0.0	0.000
26.033	0.000	0.00	0.00	0.00	0.0	0.000
26.050	0.000	0.00	0.00	0.00	0.0	0.000
26.066	0.000	0.00	0.00	0.00	0.0	0.000
26.083	0.000	0.00	0.00	0.00	0.0	0.000
26.100	0.000	0.00	0.00	0.00	0.0	0.000
26.116	0.000	0.00	0.00	0.00	0.0	0.000
26.133	0.000	0.00	0.00	0.00	0.0	0.000
26.150	0.000	0.00	0.00	0.00	0.0	0.000
26.166	0.000	0.00	0.00	0.00	0.0	0.000
26.183	0.000	0.00	0.00	0.00	0.0	0.000
26.200	0.000	0.00	0.00	0.00	0.0	0.000
26.216	0.000	0.00	0.00	0.00	0.0	0.000
26.233	0.000	0.00	0.00	0.00	0.0	0.000
26.250	0.000	0.00	0.00	0.00	0.0	0.000
26.266	0.000	0.00	0.00	0.00	0.0	0.000
26.283	0.000	0.00	0.00	0.00	0.0	0.000
26.300	0.000	0.00	0.00	0.00	0.0	0.000
26.316	0.000	0.00	0.00	0.00	0.0	0.000
26.333	0.000	0.00	0.00	0.00	0.0	0.000
26.350	0.000	0.00	0.00	0.00	0.0	0.000
26.366	0.000	0.00	0.00	0.00	0.0	0.000
26.383	0.000	0.00	0.00	0.00	0.0	0.000
26.400	0.000	0.00	0.00	0.00	0.0	0.000
26.416	0.000	0.00	0.00	0.00	0.0	0.000
26.433	0.000	0.00	0.00	0.00	0.0	0.000
26.450	0.000	0.00	0.00	0.00	0.0	0.000
26.466	0.000	0.00	0.00	0.00	0.0	0.000
26.483	0.000	0.00	0.00	0.00	0.0	0.000
26.500	0.000	0.00	0.00	0.00	0.0	0.000
26.516	0.000	0.00	0.00	0.00	0.0	0.000
26.533	0.000	0.00	0.00	0.00	0.0	0.000
26.550	0.000	0.00	0.00	0.00	0.0	0.000
26.566	0.000	0.00	0.00	0.00	0.0	0.000
26.583	0.000	0.00	0.00	0.00	0.0	0.000
26.600	0.000	0.00	0.00	0.00	0.0	0.000
26.616	0.000	0.00	0.00	0.00	0.0	0.000
26.633	0.000	0.00	0.00	0.00	0.0	0.000
26.650	0.000	0.00	0.00	0.00	0.0	0.000
26.666	0.000	0.00	0.00	0.00	0.0	0.000
26.683	0.000	0.00	0.00	0.00	0.0	0.000
26.700	0.000	0.00	0.00	0.00	0.0	0.000
26.716	0.000	0.00	0.00	0.00	0.0	0.000
26.733	0.000	0.00	0.00	0.00	0.0	0.000
26.750	0.000	0.00	0.00	0.00	0.0	0.000
26.766	0.000	0.00	0.00	0.00	0.0	0.000
26.783	0.000	0.00	0.00	0.00	0.0	0.000
26.800	0.000	0.00	0.00	0.00	0.0	0.000
26.816	0.000	0.00	0.00	0.00	0.0	0.000
26.833	0.000	0.00	0.00	0.00	0.0	0.000
26.850	0.000	0.00	0.00	0.00	0.0	0.000
26.866	0.000	0.00	0.00	0.00	0.0	0.000
26.883	0.000	0.00	0.00	0.00	0.0	0.000
26.900	0.000	0.00	0.00	0.00	0.0	0.000
26.916	0.000	0.00	0.00	0.00	0.0	0.000
26.933	0.000	0.00	0.00	0.00	0.0	0.000
26.950	0.000	0.00	0.00	0.00	0.0	0.000
26.966	0.000	0.00	0.00	0.00	0.0	0.000
26.983	0.000	0.00	0.00	0.00	0.0	0.000
27.000	0.000	0.00	0.00	0.00	0.0	0.000
27.016	0.000	0.00	0.00	0.00	0.0	0.000
27.033	0.000	0.00	0.00	0.00	0.0	0.000
27.050	0.000	0.00	0.00	0.00	0.0	0.000
27.066	0.000	0.00	0.00	0.00	0.0	0.000
27.083	0.000	0.00	0.00	0.00	0.0	0.000
27.100	0.000	0.00	0.00	0.00	0.0	0.000
27.116	0.000	0.00	0.00	0.00	0.0	0.000
27.133	0.000	0.00	0.00	0.00	0.0	0.000
27.150	0.000	0.00	0.00	0.00	0.0	0.000
27.166	0.000	0.00	0.00	0.00	0.0	0.000
27.183	0.000	0.00	0.00	0.00	0.0	0.000
27.200	0.000	0.00	0.00	0.00	0.0	0.000
27.216	0.000	0.00	0.00	0.00	0.0	0.000
27.233	0.000	0.00	0.00	0.00	0.0	0.000
27.250	0.000	0.00	0.00	0.00	0.0	0.000
27.266	0.000	0.00	0.00	0.00	0.0	0.000

27.283	0.000	0.00	0.00	0.00	0.0	0.000
27.300	0.000	0.00	0.00	0.00	0.0	0.000
27.316	0.000	0.00	0.00	0.00	0.0	0.000
27.333	0.000	0.00	0.00	0.00	0.0	0.000
27.350	0.000	0.00	0.00	0.00	0.0	0.000
27.366	0.000	0.00	0.00	0.00	0.0	0.000
27.383	0.000	0.00	0.00	0.00	0.0	0.000
27.400	0.000	0.00	0.00	0.00	0.0	0.000
27.416	0.000	0.00	0.00	0.00	0.0	0.000
27.433	0.000	0.00	0.00	0.00	0.0	0.000
27.450	0.000	0.00	0.00	0.00	0.0	0.000
27.466	0.000	0.00	0.00	0.00	0.0	0.000
27.483	0.000	0.00	0.00	0.00	0.0	0.000
27.500	0.000	0.00	0.00	0.00	0.0	0.000
27.516	0.000	0.00	0.00	0.00	0.0	0.000
27.533	0.000	0.00	0.00	0.00	0.0	0.000
27.550	0.000	0.00	0.00	0.00	0.0	0.000
27.566	0.000	0.00	0.00	0.00	0.0	0.000
27.583	0.000	0.00	0.00	0.00	0.0	0.000
27.600	0.000	0.00	0.00	0.00	0.0	0.000
27.616	0.000	0.00	0.00	0.00	0.0	0.000
27.633	0.000	0.00	0.00	0.00	0.0	0.000
27.650	0.000	0.00	0.00	0.00	0.0	0.000
27.666	0.000	0.00	0.00	0.00	0.0	0.000
27.683	0.000	0.00	0.00	0.00	0.0	0.000
27.700	0.000	0.00	0.00	0.00	0.0	0.000
27.716	0.000	0.00	0.00	0.00	0.0	0.000
27.733	0.000	0.00	0.00	0.00	0.0	0.000
27.750	0.000	0.00	0.00	0.00	0.0	0.000
27.766	0.000	0.00	0.00	0.00	0.0	0.000
27.783	0.000	0.00	0.00	0.00	0.0	0.000
27.800	0.000	0.00	0.00	0.00	0.0	0.000
27.816	0.000	0.00	0.00	0.00	0.0	0.000
27.833	0.000	0.00	0.00	0.00	0.0	0.000
27.850	0.000	0.00	0.00	0.00	0.0	0.000
27.866	0.000	0.00	0.00	0.00	0.0	0.000
27.883	0.000	0.00	0.00	0.00	0.0	0.000
27.900	0.000	0.00	0.00	0.00	0.0	0.000
27.916	0.000	0.00	0.00	0.00	0.0	0.000
27.933	0.000	0.00	0.00	0.00	0.0	0.000
27.950	0.000	0.00	0.00	0.00	0.0	0.000
27.966	0.000	0.00	0.00	0.00	0.0	0.000
27.983	0.000	0.00	0.00	0.00	0.0	0.000
28.000	0.000	0.00	0.00	0.00	0.0	0.000
28.016	0.000	0.00	0.00	0.00	0.0	0.000
28.033	0.000	0.00	0.00	0.00	0.0	0.000
28.050	0.000	0.00	0.00	0.00	0.0	0.000
28.066	0.000	0.00	0.00	0.00	0.0	0.000
28.083	0.000	0.00	0.00	0.00	0.0	0.000
28.100	0.000	0.00	0.00	0.00	0.0	0.000
28.116	0.000	0.00	0.00	0.00	0.0	0.000
28.133	0.000	0.00	0.00	0.00	0.0	0.000
28.150	0.000	0.00	0.00	0.00	0.0	0.000
28.166	0.000	0.00	0.00	0.00	0.0	0.000
28.183	0.000	0.00	0.00	0.00	0.0	0.000
28.200	0.000	0.00	0.00	0.00	0.0	0.000
28.216	0.000	0.00	0.00	0.00	0.0	0.000
28.233	0.000	0.00	0.00	0.00	0.0	0.000
28.250	0.000	0.00	0.00	0.00	0.0	0.000
28.266	0.000	0.00	0.00	0.00	0.0	0.000
28.283	0.000	0.00	0.00	0.00	0.0	0.000
28.300	0.000	0.00	0.00	0.00	0.0	0.000
28.316	0.000	0.00	0.00	0.00	0.0	0.000
28.333	0.000	0.00	0.00	0.00	0.0	0.000
28.350	0.000	0.00	0.00	0.00	0.0	0.000
28.366	0.000	0.00	0.00	0.00	0.0	0.000
28.383	0.000	0.00	0.00	0.00	0.0	0.000
28.400	0.000	0.00	0.00	0.00	0.0	0.000
28.416	0.000	0.00	0.00	0.00	0.0	0.000
28.433	0.000	0.00	0.00	0.00	0.0	0.000
28.450	0.000	0.00	0.00	0.00	0.0	0.000
28.466	0.000	0.00	0.00	0.00	0.0	0.000
28.483	0.000	0.00	0.00	0.00	0.0	0.000
28.500	0.000	0.00	0.00	0.00	0.0	0.000
28.516	0.000	0.00	0.00	0.00	0.0	0.000
28.533	0.000	0.00	0.00	0.00	0.0	0.000
28.550	0.000	0.00	0.00	0.00	0.0	0.000
28.566	0.000	0.00	0.00	0.00	0.0	0.000
28.583	0.000	0.00	0.00	0.00	0.0	0.000

28.600	0.000	0.00	0.00	0.00	0.0	0.000
28.616	0.000	0.00	0.00	0.00	0.0	0.000
28.633	0.000	0.00	0.00	0.00	0.0	0.000
28.650	0.000	0.00	0.00	0.00	0.0	0.000
28.666	0.000	0.00	0.00	0.00	0.0	0.000
28.683	0.000	0.00	0.00	0.00	0.0	0.000
28.700	0.000	0.00	0.00	0.00	0.0	0.000
28.716	0.000	0.00	0.00	0.00	0.0	0.000
28.733	0.000	0.00	0.00	0.00	0.0	0.000
28.750	0.000	0.00	0.00	0.00	0.0	0.000
28.766	0.000	0.00	0.00	0.00	0.0	0.000
28.783	0.000	0.00	0.00	0.00	0.0	0.000
28.800	0.000	0.00	0.00	0.00	0.0	0.000
28.816	0.000	0.00	0.00	0.00	0.0	0.000
28.833	0.000	0.00	0.00	0.00	0.0	0.000
28.850	0.000	0.00	0.00	0.00	0.0	0.000
28.866	0.000	0.00	0.00	0.00	0.0	0.000
28.883	0.000	0.00	0.00	0.00	0.0	0.000
28.900	0.000	0.00	0.00	0.00	0.0	0.000
28.916	0.000	0.00	0.00	0.00	0.0	0.000
28.933	0.000	0.00	0.00	0.00	0.0	0.000
28.950	0.000	0.00	0.00	0.00	0.0	0.000
28.966	0.000	0.00	0.00	0.00	0.0	0.000
28.983	0.000	0.00	0.00	0.00	0.0	0.000
29.000	0.000	0.00	0.00	0.00	0.0	0.000
29.016	0.000	0.00	0.00	0.00	0.0	0.000
29.033	0.000	0.00	0.00	0.00	0.0	0.000
29.050	0.000	0.00	0.00	0.00	0.0	0.000
29.066	0.000	0.00	0.00	0.00	0.0	0.000
29.083	0.000	0.00	0.00	0.00	0.0	0.000
29.100	0.000	0.00	0.00	0.00	0.0	0.000
29.116	0.000	0.00	0.00	0.00	0.0	0.000
29.133	0.000	0.00	0.00	0.00	0.0	0.000
29.150	0.000	0.00	0.00	0.00	0.0	0.000
29.166	0.000	0.00	0.00	0.00	0.0	0.000
29.183	0.000	0.00	0.00	0.00	0.0	0.000
29.200	0.000	0.00	0.00	0.00	0.0	0.000
29.216	0.000	0.00	0.00	0.00	0.0	0.000
29.233	0.000	0.00	0.00	0.00	0.0	0.000
29.250	0.000	0.00	0.00	0.00	0.0	0.000
29.266	0.000	0.00	0.00	0.00	0.0	0.000
29.283	0.000	0.00	0.00	0.00	0.0	0.000
29.300	0.000	0.00	0.00	0.00	0.0	0.000
29.316	0.000	0.00	0.00	0.00	0.0	0.000
29.333	0.000	0.00	0.00	0.00	0.0	0.000
29.350	0.000	0.00	0.00	0.00	0.0	0.000
29.366	0.000	0.00	0.00	0.00	0.0	0.000
29.383	0.000	0.00	0.00	0.00	0.0	0.000
29.400	0.000	0.00	0.00	0.00	0.0	0.000
29.416	0.000	0.00	0.00	0.00	0.0	0.000
29.433	0.000	0.00	0.00	0.00	0.0	0.000
29.450	0.000	0.00	0.00	0.00	0.0	0.000
29.466	0.000	0.00	0.00	0.00	0.0	0.000
29.483	0.000	0.00	0.00	0.00	0.0	0.000
29.500	0.000	0.00	0.00	0.00	0.0	0.000
29.516	0.000	0.00	0.00	0.00	0.0	0.000
29.533	0.000	0.00	0.00	0.00	0.0	0.000
29.550	0.000	0.00	0.00	0.00	0.0	0.000
29.566	0.000	0.00	0.00	0.00	0.0	0.000
29.583	0.000	0.00	0.00	0.00	0.0	0.000
29.600	0.000	0.00	0.00	0.00	0.0	0.000
29.616	0.000	0.00	0.00	0.00	0.0	0.000
29.633	0.000	0.00	0.00	0.00	0.0	0.000
29.650	0.000	0.00	0.00	0.00	0.0	0.000
29.666	0.000	0.00	0.00	0.00	0.0	0.000
29.683	0.000	0.00	0.00	0.00	0.0	0.000
29.700	0.000	0.00	0.00	0.00	0.0	0.000
29.716	0.000	0.00	0.00	0.00	0.0	0.000
29.733	0.000	0.00	0.00	0.00	0.0	0.000
29.750	0.000	0.00	0.00	0.00	0.0	0.000
29.766	0.000	0.00	0.00	0.00	0.0	0.000
29.783	0.000	0.00	0.00	0.00	0.0	0.000
29.800	0.000	0.00	0.00	0.00	0.0	0.000
29.816	0.000	0.00	0.00	0.00	0.0	0.000
29.833	0.000	0.00	0.00	0.00	0.0	0.000
29.850	0.000	0.00	0.00	0.00	0.0	0.000
29.866	0.000	0.00	0.00	0.00	0.0	0.000
29.883	0.000	0.00	0.00	0.00	0.0	0.000
29.900	0.000	0.00	0.00	0.00	0.0	0.000

29.916	0.000	0.00	0.00	0.00	0.0	0.000
29.933	0.000	0.00	0.00	0.00	0.0	0.000
29.950	0.000	0.00	0.00	0.00	0.0	0.000
29.966	0.000	0.00	0.00	0.00	0.0	0.000
29.983	0.000	0.00	0.00	0.00	0.0	0.000
30.000	0.000	0.00	0.00	0.00	0.0	0.000
30.016	0.000	0.00	0.00	0.00	0.0	0.000
30.033	0.000	0.00	0.00	0.00	0.0	0.000
30.050	0.000	0.00	0.00	0.00	0.0	0.000
30.066	0.000	0.00	0.00	0.00	0.0	0.000
30.083	0.000	0.00	0.00	0.00	0.0	0.000
30.100	0.000	0.00	0.00	0.00	0.0	0.000
30.116	0.000	0.00	0.00	0.00	0.0	0.000
30.133	0.000	0.00	0.00	0.00	0.0	0.000
30.150	0.000	0.00	0.00	0.00	0.0	0.000
30.166	0.000	0.00	0.00	0.00	0.0	0.000
30.183	0.000	0.00	0.00	0.00	0.0	0.000
30.200	0.000	0.00	0.00	0.00	0.0	0.000
30.216	0.000	0.00	0.00	0.00	0.0	0.000
30.233	0.000	0.00	0.00	0.00	0.0	0.000
30.250	0.000	0.00	0.00	0.00	0.0	0.000
30.266	0.000	0.00	0.00	0.00	0.0	0.000
30.283	0.000	0.00	0.00	0.00	0.0	0.000
30.300	0.000	0.00	0.00	0.00	0.0	0.000
30.316	0.000	0.00	0.00	0.00	0.0	0.000
30.333	0.000	0.00	0.00	0.00	0.0	0.000
30.350	0.000	0.00	0.00	0.00	0.0	0.000
30.366	0.000	0.00	0.00	0.00	0.0	0.000
30.383	0.000	0.00	0.00	0.00	0.0	0.000
30.400	0.000	0.00	0.00	0.00	0.0	0.000
30.416	0.000	0.00	0.00	0.00	0.0	0.000
30.433	0.000	0.00	0.00	0.00	0.0	0.000
30.450	0.000	0.00	0.00	0.00	0.0	0.000
30.466	0.000	0.00	0.00	0.00	0.0	0.000
30.483	0.000	0.00	0.00	0.00	0.0	0.000
30.500	0.000	0.00	0.00	0.00	0.0	0.000
30.516	0.000	0.00	0.00	0.00	0.0	0.000
30.533	0.000	0.00	0.00	0.00	0.0	0.000
30.550	0.000	0.00	0.00	0.00	0.0	0.000
30.566	0.000	0.00	0.00	0.00	0.0	0.000
30.583	0.000	0.00	0.00	0.00	0.0	0.000
30.600	0.000	0.00	0.00	0.00	0.0	0.000
30.616	0.000	0.00	0.00	0.00	0.0	0.000
30.633	0.000	0.00	0.00	0.00	0.0	0.000
30.650	0.000	0.00	0.00	0.00	0.0	0.000
30.666	0.000	0.00	0.00	0.00	0.0	0.000
30.683	0.000	0.00	0.00	0.00	0.0	0.000
30.700	0.000	0.00	0.00	0.00	0.0	0.000
30.716	0.000	0.00	0.00	0.00	0.0	0.000
30.733	0.000	0.00	0.00	0.00	0.0	0.000
30.750	0.000	0.00	0.00	0.00	0.0	0.000
30.766	0.000	0.00	0.00	0.00	0.0	0.000
30.783	0.000	0.00	0.00	0.00	0.0	0.000
30.800	0.000	0.00	0.00	0.00	0.0	0.000
30.816	0.000	0.00	0.00	0.00	0.0	0.000
30.833	0.000	0.00	0.00	0.00	0.0	0.000
30.850	0.000	0.00	0.00	0.00	0.0	0.000
30.866	0.000	0.00	0.00	0.00	0.0	0.000
30.883	0.000	0.00	0.00	0.00	0.0	0.000
30.900	0.000	0.00	0.00	0.00	0.0	0.000
30.916	0.000	0.00	0.00	0.00	0.0	0.000
30.933	0.000	0.00	0.00	0.00	0.0	0.000
30.950	0.000	0.00	0.00	0.00	0.0	0.000
30.966	0.000	0.00	0.00	0.00	0.0	0.000
30.983	0.000	0.00	0.00	0.00	0.0	0.000
31.000	0.000	0.00	0.00	0.00	0.0	0.000
31.016	0.000	0.00	0.00	0.00	0.0	0.000
31.033	0.000	0.00	0.00	0.00	0.0	0.000
31.050	0.000	0.00	0.00	0.00	0.0	0.000
31.066	0.000	0.00	0.00	0.00	0.0	0.000
31.083	0.000	0.00	0.00	0.00	0.0	0.000
31.100	0.000	0.00	0.00	0.00	0.0	0.000
31.116	0.000	0.00	0.00	0.00	0.0	0.000
31.133	0.000	0.00	0.00	0.00	0.0	0.000
31.150	0.000	0.00	0.00	0.00	0.0	0.000
31.166	0.000	0.00	0.00	0.00	0.0	0.000
31.183	0.000	0.00	0.00	0.00	0.0	0.000
31.200	0.000	0.00	0.00	0.00	0.0	0.000
31.216	0.000	0.00	0.00	0.00	0.0	0.000

31.233	0.000	0.00	0.00	0.00	0.0	0.000
31.250	0.000	0.00	0.00	0.00	0.0	0.000
31.266	0.000	0.00	0.00	0.00	0.0	0.000
31.283	0.000	0.00	0.00	0.00	0.0	0.000
31.300	0.000	0.00	0.00	0.00	0.0	0.000
31.316	0.000	0.00	0.00	0.00	0.0	0.000
31.333	0.000	0.00	0.00	0.00	0.0	0.000
31.350	0.000	0.00	0.00	0.00	0.0	0.000
31.366	0.000	0.00	0.00	0.00	0.0	0.000
31.383	0.000	0.00	0.00	0.00	0.0	0.000
31.400	0.000	0.00	0.00	0.00	0.0	0.000
31.416	0.000	0.00	0.00	0.00	0.0	0.000
31.433	0.000	0.00	0.00	0.00	0.0	0.000
31.450	0.000	0.00	0.00	0.00	0.0	0.000
31.466	0.000	0.00	0.00	0.00	0.0	0.000
31.483	0.000	0.00	0.00	0.00	0.0	0.000
31.500	0.000	0.00	0.00	0.00	0.0	0.000
31.516	0.000	0.00	0.00	0.00	0.0	0.000
31.533	0.000	0.00	0.00	0.00	0.0	0.000
31.550	0.000	0.00	0.00	0.00	0.0	0.000
31.566	0.000	0.00	0.00	0.00	0.0	0.000
31.583	0.000	0.00	0.00	0.00	0.0	0.000
31.600	0.000	0.00	0.00	0.00	0.0	0.000
31.616	0.000	0.00	0.00	0.00	0.0	0.000
31.633	0.000	0.00	0.00	0.00	0.0	0.000
31.650	0.000	0.00	0.00	0.00	0.0	0.000
31.666	0.000	0.00	0.00	0.00	0.0	0.000
31.683	0.000	0.00	0.00	0.00	0.0	0.000
31.700	0.000	0.00	0.00	0.00	0.0	0.000
31.716	0.000	0.00	0.00	0.00	0.0	0.000
31.733	0.000	0.00	0.00	0.00	0.0	0.000
31.750	0.000	0.00	0.00	0.00	0.0	0.000
31.766	0.000	0.00	0.00	0.00	0.0	0.000
31.783	0.000	0.00	0.00	0.00	0.0	0.000
31.800	0.000	0.00	0.00	0.00	0.0	0.000
31.816	0.000	0.00	0.00	0.00	0.0	0.000
31.833	0.000	0.00	0.00	0.00	0.0	0.000
31.850	0.000	0.00	0.00	0.00	0.0	0.000
31.866	0.000	0.00	0.00	0.00	0.0	0.000
31.883	0.000	0.00	0.00	0.00	0.0	0.000
31.900	0.000	0.00	0.00	0.00	0.0	0.000
31.916	0.000	0.00	0.00	0.00	0.0	0.000
31.933	0.000	0.00	0.00	0.00	0.0	0.000
31.950	0.000	0.00	0.00	0.00	0.0	0.000
31.966	0.000	0.00	0.00	0.00	0.0	0.000
31.983	0.000	0.00	0.00	0.00	0.0	0.000
32.000	0.000	0.00	0.00	0.00	0.0	0.000
32.016	0.000	0.00	0.00	0.00	0.0	0.000
32.033	0.000	0.00	0.00	0.00	0.0	0.000
32.050	0.000	0.00	0.00	0.00	0.0	0.000
32.066	0.000	0.00	0.00	0.00	0.0	0.000
32.083	0.000	0.00	0.00	0.00	0.0	0.000
32.100	0.000	0.00	0.00	0.00	0.0	0.000
32.116	0.000	0.00	0.00	0.00	0.0	0.000
32.133	0.000	0.00	0.00	0.00	0.0	0.000
32.150	0.000	0.00	0.00	0.00	0.0	0.000
32.166	0.000	0.00	0.00	0.00	0.0	0.000
32.183	0.000	0.00	0.00	0.00	0.0	0.000
32.200	0.000	0.00	0.00	0.00	0.0	0.000
32.216	0.000	0.00	0.00	0.00	0.0	0.000
32.233	0.000	0.00	0.00	0.00	0.0	0.000
32.250	0.000	0.00	0.00	0.00	0.0	0.000
32.266	0.000	0.00	0.00	0.00	0.0	0.000
32.283	0.000	0.00	0.00	0.00	0.0	0.000
32.300	0.000	0.00	0.00	0.00	0.0	0.000
32.316	0.000	0.00	0.00	0.00	0.0	0.000
32.333	0.000	0.00	0.00	0.00	0.0	0.000
32.350	0.000	0.00	0.00	0.00	0.0	0.000
32.366	0.000	0.00	0.00	0.00	0.0	0.000
32.383	0.000	0.00	0.00	0.00	0.0	0.000
32.400	0.000	0.00	0.00	0.00	0.0	0.000
32.416	0.000	0.00	0.00	0.00	0.0	0.000
32.433	0.000	0.00	0.00	0.00	0.0	0.000
32.450	0.000	0.00	0.00	0.00	0.0	0.000
32.466	0.000	0.00	0.00	0.00	0.0	0.000
32.483	0.000	0.00	0.00	0.00	0.0	0.000
32.500	0.000	0.00	0.00	0.00	0.0	0.000
32.516	0.000	0.00	0.00	0.00	0.0	0.000
32.533	0.000	0.00	0.00	0.00	0.0	0.000

32.550	0.000	0.00	0.00	0.00	0.0	0.000
32.566	0.000	0.00	0.00	0.00	0.0	0.000
32.583	0.000	0.00	0.00	0.00	0.0	0.000
32.600	0.000	0.00	0.00	0.00	0.0	0.000
32.616	0.000	0.00	0.00	0.00	0.0	0.000
32.633	0.000	0.00	0.00	0.00	0.0	0.000
32.650	0.000	0.00	0.00	0.00	0.0	0.000
32.666	0.000	0.00	0.00	0.00	0.0	0.000
32.683	0.000	0.00	0.00	0.00	0.0	0.000
32.700	0.000	0.00	0.00	0.00	0.0	0.000
32.716	0.000	0.00	0.00	0.00	0.0	0.000
32.733	0.000	0.00	0.00	0.00	0.0	0.000
32.750	0.000	0.00	0.00	0.00	0.0	0.000
32.766	0.000	0.00	0.00	0.00	0.0	0.000
32.783	0.000	0.00	0.00	0.00	0.0	0.000
32.800	0.000	0.00	0.00	0.00	0.0	0.000
32.816	0.000	0.00	0.00	0.00	0.0	0.000
32.833	0.000	0.00	0.00	0.00	0.0	0.000
32.850	0.000	0.00	0.00	0.00	0.0	0.000
32.866	0.000	0.00	0.00	0.00	0.0	0.000
32.883	0.000	0.00	0.00	0.00	0.0	0.000
32.900	0.000	0.00	0.00	0.00	0.0	0.000
32.916	0.000	0.00	0.00	0.00	0.0	0.000
32.933	0.000	0.00	0.00	0.00	0.0	0.000
32.950	0.000	0.00	0.00	0.00	0.0	0.000
32.966	0.000	0.00	0.00	0.00	0.0	0.000
32.983	0.000	0.00	0.00	0.00	0.0	0.000
33.000	0.000	0.00	0.00	0.00	0.0	0.000
33.016	0.000	0.00	0.00	0.00	0.0	0.000
33.033	0.000	0.00	0.00	0.00	0.0	0.000
33.050	0.000	0.00	0.00	0.00	0.0	0.000
33.066	0.000	0.00	0.00	0.00	0.0	0.000
33.083	0.000	0.00	0.00	0.00	0.0	0.000
33.100	0.000	0.00	0.00	0.00	0.0	0.000
33.116	0.000	0.00	0.00	0.00	0.0	0.000
33.133	0.000	0.00	0.00	0.00	0.0	0.000
33.150	0.000	0.00	0.00	0.00	0.0	0.000
33.166	0.000	0.00	0.00	0.00	0.0	0.000
33.183	0.000	0.00	0.00	0.00	0.0	0.000
33.200	0.000	0.00	0.00	0.00	0.0	0.000
33.216	0.000	0.00	0.00	0.00	0.0	0.000
33.233	0.000	0.00	0.00	0.00	0.0	0.000
33.250	0.000	0.00	0.00	0.00	0.0	0.000
33.266	0.000	0.00	0.00	0.00	0.0	0.000
33.283	0.000	0.00	0.00	0.00	0.0	0.000
33.300	0.000	0.00	0.00	0.00	0.0	0.000
33.316	0.000	0.00	0.00	0.00	0.0	0.000
33.333	0.000	0.00	0.00	0.00	0.0	0.000
33.350	0.000	0.00	0.00	0.00	0.0	0.000
33.366	0.000	0.00	0.00	0.00	0.0	0.000
33.383	0.000	0.00	0.00	0.00	0.0	0.000
33.400	0.000	0.00	0.00	0.00	0.0	0.000
33.416	0.000	0.00	0.00	0.00	0.0	0.000
33.433	0.000	0.00	0.00	0.00	0.0	0.000
33.450	0.000	0.00	0.00	0.00	0.0	0.000
33.466	0.000	0.00	0.00	0.00	0.0	0.000
33.483	0.000	0.00	0.00	0.00	0.0	0.000
33.500	0.000	0.00	0.00	0.00	0.0	0.000
33.516	0.000	0.00	0.00	0.00	0.0	0.000
33.533	0.000	0.00	0.00	0.00	0.0	0.000
33.550	0.000	0.00	0.00	0.00	0.0	0.000
33.566	0.000	0.00	0.00	0.00	0.0	0.000
33.583	0.000	0.00	0.00	0.00	0.0	0.000
33.600	0.000	0.00	0.00	0.00	0.0	0.000
33.616	0.000	0.00	0.00	0.00	0.0	0.000
33.633	0.000	0.00	0.00	0.00	0.0	0.000
33.650	0.000	0.00	0.00	0.00	0.0	0.000
33.666	0.000	0.00	0.00	0.00	0.0	0.000
33.683	0.000	0.00	0.00	0.00	0.0	0.000
33.700	0.000	0.00	0.00	0.00	0.0	0.000
33.716	0.000	0.00	0.00	0.00	0.0	0.000
33.733	0.000	0.00	0.00	0.00	0.0	0.000
33.750	0.000	0.00	0.00	0.00	0.0	0.000
33.766	0.000	0.00	0.00	0.00	0.0	0.000
33.783	0.000	0.00	0.00	0.00	0.0	0.000
33.800	0.000	0.00	0.00	0.00	0.0	0.000
33.816	0.000	0.00	0.00	0.00	0.0	0.000
33.833	0.000	0.00	0.00	0.00	0.0	0.000
33.850	0.000	0.00	0.00	0.00	0.0	0.000

33.866	0.000	0.00	0.00	0.00	0.0	0.000
33.883	0.000	0.00	0.00	0.00	0.0	0.000
33.900	0.000	0.00	0.00	0.00	0.0	0.000
33.916	0.000	0.00	0.00	0.00	0.0	0.000
33.933	0.000	0.00	0.00	0.00	0.0	0.000
33.950	0.000	0.00	0.00	0.00	0.0	0.000
33.966	0.000	0.00	0.00	0.00	0.0	0.000
33.983	0.000	0.00	0.00	0.00	0.0	0.000
34.000	0.000	0.00	0.00	0.00	0.0	0.000
34.016	0.000	0.00	0.00	0.00	0.0	0.000
34.033	0.000	0.00	0.00	0.00	0.0	0.000
34.050	0.000	0.00	0.00	0.00	0.0	0.000
34.066	0.000	0.00	0.00	0.00	0.0	0.000
34.083	0.000	0.00	0.00	0.00	0.0	0.000
34.100	0.000	0.00	0.00	0.00	0.0	0.000
34.116	0.000	0.00	0.00	0.00	0.0	0.000
34.133	0.000	0.00	0.00	0.00	0.0	0.000
34.150	0.000	0.00	0.00	0.00	0.0	0.000
34.166	0.000	0.00	0.00	0.00	0.0	0.000
34.183	0.000	0.00	0.00	0.00	0.0	0.000
34.200	0.000	0.00	0.00	0.00	0.0	0.000
34.216	0.000	0.00	0.00	0.00	0.0	0.000
34.233	0.000	0.00	0.00	0.00	0.0	0.000
34.250	0.000	0.00	0.00	0.00	0.0	0.000
34.266	0.000	0.00	0.00	0.00	0.0	0.000
34.283	0.000	0.00	0.00	0.00	0.0	0.000
34.300	0.000	0.00	0.00	0.00	0.0	0.000
34.316	0.000	0.00	0.00	0.00	0.0	0.000
34.333	0.000	0.00	0.00	0.00	0.0	0.000
34.350	0.000	0.00	0.00	0.00	0.0	0.000
34.366	0.000	0.00	0.00	0.00	0.0	0.000
34.383	0.000	0.00	0.00	0.00	0.0	0.000
34.400	0.000	0.00	0.00	0.00	0.0	0.000
34.416	0.000	0.00	0.00	0.00	0.0	0.000
34.433	0.000	0.00	0.00	0.00	0.0	0.000
34.450	0.000	0.00	0.00	0.00	0.0	0.000
34.466	0.000	0.00	0.00	0.00	0.0	0.000
34.483	0.000	0.00	0.00	0.00	0.0	0.000
34.500	0.000	0.00	0.00	0.00	0.0	0.000
34.516	0.000	0.00	0.00	0.00	0.0	0.000
34.533	0.000	0.00	0.00	0.00	0.0	0.000
34.550	0.000	0.00	0.00	0.00	0.0	0.000
34.566	0.000	0.00	0.00	0.00	0.0	0.000
34.583	0.000	0.00	0.00	0.00	0.0	0.000
34.600	0.000	0.00	0.00	0.00	0.0	0.000
34.616	0.000	0.00	0.00	0.00	0.0	0.000
34.633	0.000	0.00	0.00	0.00	0.0	0.000
34.650	0.000	0.00	0.00	0.00	0.0	0.000
34.666	0.000	0.00	0.00	0.00	0.0	0.000
34.683	0.000	0.00	0.00	0.00	0.0	0.000
34.700	0.000	0.00	0.00	0.00	0.0	0.000
34.716	0.000	0.00	0.00	0.00	0.0	0.000
34.733	0.000	0.00	0.00	0.00	0.0	0.000
34.750	0.000	0.00	0.00	0.00	0.0	0.000
34.766	0.000	0.00	0.00	0.00	0.0	0.000
34.783	0.000	0.00	0.00	0.00	0.0	0.000
34.800	0.000	0.00	0.00	0.00	0.0	0.000
34.816	0.000	0.00	0.00	0.00	0.0	0.000
34.833	0.000	0.00	0.00	0.00	0.0	0.000
34.850	0.000	0.00	0.00	0.00	0.0	0.000
34.866	0.000	0.00	0.00	0.00	0.0	0.000
34.883	0.000	0.00	0.00	0.00	0.0	0.000
34.900	0.000	0.00	0.00	0.00	0.0	0.000
34.916	0.000	0.00	0.00	0.00	0.0	0.000
34.933	0.000	0.00	0.00	0.00	0.0	0.000
34.950	0.000	0.00	0.00	0.00	0.0	0.000
34.966	0.000	0.00	0.00	0.00	0.0	0.000
34.983	0.000	0.00	0.00	0.00	0.0	0.000
35.000	0.000	0.00	0.00	0.00	0.0	0.000
35.016	0.000	0.00	0.00	0.00	0.0	0.000
35.033	0.000	0.00	0.00	0.00	0.0	0.000
35.050	0.000	0.00	0.00	0.00	0.0	0.000
35.066	0.000	0.00	0.00	0.00	0.0	0.000
35.083	0.000	0.00	0.00	0.00	0.0	0.000
35.100	0.000	0.00	0.00	0.00	0.0	0.000
35.116	0.000	0.00	0.00	0.00	0.0	0.000
35.133	0.000	0.00	0.00	0.00	0.0	0.000
35.150	0.000	0.00	0.00	0.00	0.0	0.000
35.166	0.000	0.00	0.00	0.00	0.0	0.000

35.183	0.000	0.00	0.00	0.00	0.0	0.000
35.200	0.000	0.00	0.00	0.00	0.0	0.000
35.216	0.000	0.00	0.00	0.00	0.0	0.000
35.233	0.000	0.00	0.00	0.00	0.0	0.000
35.250	0.000	0.00	0.00	0.00	0.0	0.000
35.266	0.000	0.00	0.00	0.00	0.0	0.000
35.283	0.000	0.00	0.00	0.00	0.0	0.000
35.300	0.000	0.00	0.00	0.00	0.0	0.000
35.316	0.000	0.00	0.00	0.00	0.0	0.000
35.333	0.000	0.00	0.00	0.00	0.0	0.000
35.350	0.000	0.00	0.00	0.00	0.0	0.000
35.366	0.000	0.00	0.00	0.00	0.0	0.000
35.383	0.000	0.00	0.00	0.00	0.0	0.000
35.400	0.000	0.00	0.00	0.00	0.0	0.000
35.416	0.000	0.00	0.00	0.00	0.0	0.000
35.433	0.000	0.00	0.00	0.00	0.0	0.000
35.450	0.000	0.00	0.00	0.00	0.0	0.000
35.466	0.000	0.00	0.00	0.00	0.0	0.000
35.483	0.000	0.00	0.00	0.00	0.0	0.000
35.500	0.000	0.00	0.00	0.00	0.0	0.000
35.516	0.000	0.00	0.00	0.00	0.0	0.000
35.533	0.000	0.00	0.00	0.00	0.0	0.000
35.550	0.000	0.00	0.00	0.00	0.0	0.000
35.566	0.000	0.00	0.00	0.00	0.0	0.000
35.583	0.000	0.00	0.00	0.00	0.0	0.000
35.600	0.000	0.00	0.00	0.00	0.0	0.000
35.616	0.000	0.00	0.00	0.00	0.0	0.000
35.633	0.000	0.00	0.00	0.00	0.0	0.000
35.650	0.000	0.00	0.00	0.00	0.0	0.000
35.666	0.000	0.00	0.00	0.00	0.0	0.000
35.683	0.000	0.00	0.00	0.00	0.0	0.000
35.700	0.000	0.00	0.00	0.00	0.0	0.000
35.716	0.000	0.00	0.00	0.00	0.0	0.000
35.733	0.000	0.00	0.00	0.00	0.0	0.000
35.750	0.000	0.00	0.00	0.00	0.0	0.000
35.766	0.000	0.00	0.00	0.00	0.0	0.000
35.783	0.000	0.00	0.00	0.00	0.0	0.000
35.800	0.000	0.00	0.00	0.00	0.0	0.000
35.816	0.000	0.00	0.00	0.00	0.0	0.000
35.833	0.000	0.00	0.00	0.00	0.0	0.000
35.850	0.000	0.00	0.00	0.00	0.0	0.000
35.866	0.000	0.00	0.00	0.00	0.0	0.000
35.883	0.000	0.00	0.00	0.00	0.0	0.000
35.900	0.000	0.00	0.00	0.00	0.0	0.000
35.916	0.000	0.00	0.00	0.00	0.0	0.000
35.933	0.000	0.00	0.00	0.00	0.0	0.000
35.950	0.000	0.00	0.00	0.00	0.0	0.000
35.966	0.000	0.00	0.00	0.00	0.0	0.000
35.983	0.000	0.00	0.00	0.00	0.0	0.000
36.000	0.000	0.00	0.00	0.00	0.0	0.000

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 13.817 AF
BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 13.817 AF
LOSS VOLUME = 0.000 AF

==========

END OF FLOODSCx ROUTING ANALYSIS

Arrow Rt. and Juneberry Dr. - Rancho Cucamonga
Basin Rating Curve

Building 4 - Nodes 160-166 - Line G Sta. 22+49.27

Elevation (ft)	Depth (ft)	Storage (cu-ft)	Storage (ac-ft)	Type SD Orifice C 0.60 Storm Drain Diameter (in) 24 Invert (ft) 1131.19 Discharge (cfs)
1136.19	0.00	0	0.000	33.824
1136.29	0.10	175	0.004	34.161
1136.39	0.20	987	0.023	34.494
1136.49	0.30	3,011	0.069	34.824
1136.59	0.40	6,827	0.157	35.151
1136.69	0.50	13,224	0.304	35.475
1136.79	0.60	21,498	0.494	35.796
1136.89	0.70	32,313	0.742	36.114
1136.99	0.80	44,694	1.026	36.430
1137.09	0.90	58,032	1.332	36.743

```
**************************************************************************

            F L O O D    R O U T I N G    A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* ARROW RT. AND JUNEBERRY DR. - RANCHO CUCAMONGA                        *
* PROPOSED CONDITION - BUILDING 4 - NODES 160-166                       *
* HYDROLOGIC ANALYSIS - 100-YEAR                                        *
 ************************************************************************

  FILE NAME: 4021P1BC.FLD
  TIME/DATE OF STUDY: 10:00 11/09/2023

   The Small Area Unit Hydrograph Procedures in Section J
   of the Hydrology Manual provides estimates of runoff
   hydrograph and runoff volume for watersheds whose time of
   concentration is less than 25 minutes. The PROGRAM User
   should check the applicability of using the small area unit
   hydrograph procedures, and follow the guidelines in
   Sections J and K.5 in complex watershed modeling.


**************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    166.00 IS CODE = 1.2
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (SMALL AREA UNIT-HYDROGRAPH ANALYSIS) <<<<<
==========================================================================

  (SMALL AREA UNIT-HYDROGRAPH ADDED TO STREAM #1)

    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   15.70
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.074
    LOW LOSS FRACTION = 0.126
    TIME OF CONCENTRATION(MIN.) =  9.10
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED:
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.51
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  1.05
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.40
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.50
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  8.20

--------------------------------------------------------------------------
    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     8.51
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     2.22

--------------------------------------------------------------------------
♠
==========================================================================

                     2 4 - H O U R    S T O R M
                  R U N O F F    H Y D R O G R A P H

==========================================================================
              HYDROGRAPH IN  ONE-MINUTE UNIT INTERVALS(CFS)
        (Notes: Time indicated is at END of Each Unit Intervals.
                Peak 5-minute rainfall intensity is modeled as
                a constant value for entire 5-minute period.)
--------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       14.9      29.7      44.6      59.4
--------------------------------------------------------------------------
   0.017      0.0004      0.26  Q         .         .         .         .
   0.033      0.0015      0.79  Q         .         .         .         .
   0.050      0.0033      1.32  Q         .         .         .         .
   0.067      0.0058      1.85  VQ        .         .         .         .
```

0.083	0.0090	2.32	VQ	.	.	.	.
0.100	0.0123	2.38	VQ	.	.	.	.
0.117	0.0156	2.38	VQ	.	.	.	.
0.133	0.0189	2.38	VQ	.	.	.	.
0.150	0.0222	2.38	VQ	.	.	.	.
0.167	0.0254	2.38	VQ	.	.	.	.
0.183	0.0287	2.38	VQ	.	.	.	.
0.200	0.0320	2.39	VQ	.	.	.	.
0.217	0.0353	2.39	VQ	.	.	.	.
0.233	0.0386	2.39	VQ	.	.	.	.
0.250	0.0419	2.39	VQ	.	.	.	.
0.267	0.0452	2.39	VQ	.	.	.	.
0.283	0.0485	2.39	VQ	.	.	.	.
0.300	0.0517	2.39	VQ	.	.	.	.
0.317	0.0550	2.39	VQ	.	.	.	.
0.333	0.0583	2.39	VQ	.	.	.	.
0.350	0.0616	2.40	VQ	.	.	.	.
0.367	0.0649	2.40	VQ	.	.	.	.
0.383	0.0683	2.40	VQ	.	.	.	.
0.400	0.0716	2.40	VQ	.	.	.	.
0.417	0.0749	2.40	VQ	.	.	.	.
0.433	0.0782	2.40	VQ	.	.	.	.
0.450	0.0815	2.40	VQ	.	.	.	.
0.467	0.0848	2.40	VQ	.	.	.	.
0.483	0.0881	2.40	VQ	.	.	.	.
0.500	0.0914	2.40	VQ	.	.	.	.
0.517	0.0947	2.41	VQ	.	.	.	.
0.533	0.0980	2.41	VQ	.	.	.	.
0.550	0.1014	2.41	VQ	.	.	.	.
0.567	0.1047	2.41	VQ	.	.	.	.
0.583	0.1080	2.41	VQ	.	.	.	.
0.600	0.1113	2.41	VQ	.	.	.	.
0.617	0.1146	2.41	VQ	.	.	.	.
0.633	0.1180	2.41	VQ	.	.	.	.
0.650	0.1213	2.42	VQ	.	.	.	.
0.667	0.1246	2.42	VQ	.	.	.	.
0.683	0.1280	2.42	VQ	.	.	.	.
0.700	0.1313	2.42	VQ	.	.	.	.
0.717	0.1346	2.42	VQ	.	.	.	.
0.733	0.1380	2.42	VQ	.	.	.	.
0.750	0.1413	2.42	VQ	.	.	.	.
0.767	0.1446	2.42	VQ	.	.	.	.
0.783	0.1480	2.42	VQ	.	.	.	.
0.800	0.1513	2.43	VQ	.	.	.	.
0.817	0.1547	2.43	VQ	.	.	.	.
0.833	0.1580	2.43	VQ	.	.	.	.
0.850	0.1613	2.43	VQ	.	.	.	.
0.867	0.1647	2.43	VQ	.	.	.	.
0.883	0.1680	2.43	VQ	.	.	.	.
0.900	0.1714	2.43	VQ	.	.	.	.
0.917	0.1747	2.43	VQ	.	.	.	.
0.933	0.1781	2.44	VQ	.	.	.	.
0.950	0.1815	2.44	VQ	.	.	.	.
0.967	0.1848	2.44	VQ	.	.	.	.
0.983	0.1882	2.44	VQ	.	.	.	.
1.000	0.1915	2.44	VQ	.	.	.	.
1.017	0.1949	2.44	VQ	.	.	.	.
1.033	0.1983	2.44	VQ	.	.	.	.
1.050	0.2016	2.44	VQ	.	.	.	.
1.067	0.2050	2.44	VQ	.	.	.	.
1.083	0.2084	2.45	VQ	.	.	.	.
1.100	0.2117	2.45	VQ	.	.	.	.
1.117	0.2151	2.45	.Q	.	.	.	.
1.133	0.2185	2.45	.Q	.	.	.	.
1.150	0.2219	2.45	.Q	.	.	.	.
1.167	0.2252	2.45	.Q	.	.	.	.
1.183	0.2286	2.45	.Q	.	.	.	.
1.200	0.2320	2.45	.Q	.	.	.	.
1.217	0.2354	2.45	.Q	.	.	.	.
1.233	0.2387	2.46	.Q	.	.	.	.
1.250	0.2421	2.46	.Q	.	.	.	.
1.267	0.2455	2.46	.Q	.	.	.	.
1.283	0.2489	2.46	.Q	.	.	.	.
1.300	0.2523	2.46	.Q	.	.	.	.
1.317	0.2557	2.46	.Q	.	.	.	.
1.333	0.2591	2.46	.Q	.	.	.	.
1.350	0.2625	2.47	.Q	.	.	.	.
1.367	0.2659	2.47	.Q	.	.	.	.
1.383	0.2693	2.47	.Q	.	.	.	.

1.400	0.2727	2.47	.Q	.	.	.	.
1.417	0.2761	2.47	.Q	.	.	.	.
1.433	0.2795	2.47	.Q	.	.	.	.
1.450	0.2829	2.47	.Q	.	.	.	.
1.467	0.2863	2.47	.Q	.	.	.	.
1.483	0.2897	2.47	.Q	.	.	.	.
1.500	0.2931	2.48	.Q	.	.	.	.
1.517	0.2965	2.48	.Q	.	.	.	.
1.533	0.2999	2.48	.Q	.	.	.	.
1.550	0.3033	2.48	.Q	.	.	.	.
1.567	0.3068	2.48	.Q	.	.	.	.
1.583	0.3102	2.48	.Q	.	.	.	.
1.600	0.3136	2.48	.Q	.	.	.	.
1.617	0.3170	2.49	.Q	.	.	.	.
1.633	0.3205	2.49	.Q	.	.	.	.
1.650	0.3239	2.49	.Q	.	.	.	.
1.667	0.3273	2.49	.Q	.	.	.	.
1.683	0.3307	2.49	.Q	.	.	.	.
1.700	0.3342	2.49	.Q	.	.	.	.
1.717	0.3376	2.49	.Q	.	.	.	.
1.733	0.3410	2.49	.Q	.	.	.	.
1.750	0.3445	2.49	.Q	.	.	.	.
1.767	0.3479	2.49	.Q	.	.	.	.
1.783	0.3513	2.50	.Q	.	.	.	.
1.800	0.3548	2.50	.Q	.	.	.	.
1.817	0.3582	2.50	.Q	.	.	.	.
1.833	0.3617	2.50	.Q	.	.	.	.
1.850	0.3651	2.50	.Q	.	.	.	.
1.867	0.3686	2.50	.Q	.	.	.	.
1.883	0.3720	2.51	.Q	.	.	.	.
1.900	0.3755	2.51	.Q	.	.	.	.
1.917	0.3789	2.51	.Q	.	.	.	.
1.933	0.3824	2.51	.Q	.	.	.	.
1.950	0.3858	2.51	.Q	.	.	.	.
1.967	0.3893	2.51	.Q	.	.	.	.
1.983	0.3928	2.51	.Q	.	.	.	.
2.000	0.3962	2.51	.Q	.	.	.	.
2.017	0.3997	2.51	.Q	.	.	.	.
2.033	0.4031	2.51	.Q	.	.	.	.
2.050	0.4066	2.52	.Q	.	.	.	.
2.067	0.4101	2.52	.Q	.	.	.	.
2.083	0.4135	2.52	.Q	.	.	.	.
2.100	0.4170	2.52	.Q	.	.	.	.
2.117	0.4205	2.52	.Q	.	.	.	.
2.133	0.4240	2.52	.Q	.	.	.	.
2.150	0.4274	2.53	.QV	.	.	.	.
2.167	0.4309	2.53	.QV	.	.	.	.
2.183	0.4344	2.53	.QV	.	.	.	.
2.200	0.4379	2.53	.QV	.	.	.	.
2.217	0.4414	2.53	.QV	.	.	.	.
2.233	0.4449	2.53	.QV	.	.	.	.
2.250	0.4484	2.53	.QV	.	.	.	.
2.267	0.4519	2.53	.QV	.	.	.	.
2.283	0.4553	2.54	.QV	.	.	.	.
2.300	0.4588	2.54	.QV	.	.	.	.
2.317	0.4623	2.54	.QV	.	.	.	.
2.333	0.4658	2.54	.QV	.	.	.	.
2.350	0.4693	2.54	.QV	.	.	.	.
2.367	0.4728	2.54	.QV	.	.	.	.
2.383	0.4763	2.54	.QV	.	.	.	.
2.400	0.4798	2.54	.QV	.	.	.	.
2.417	0.4833	2.55	.QV	.	.	.	.
2.433	0.4869	2.55	.QV	.	.	.	.
2.450	0.4904	2.55	.QV	.	.	.	.
2.467	0.4939	2.55	.QV	.	.	.	.
2.483	0.4974	2.55	.QV	.	.	.	.
2.500	0.5009	2.56	.QV	.	.	.	.
2.517	0.5044	2.56	.QV	.	.	.	.
2.533	0.5080	2.56	.QV	.	.	.	.
2.550	0.5115	2.56	.QV	.	.	.	.
2.567	0.5150	2.56	.QV	.	.	.	.
2.583	0.5185	2.56	.QV	.	.	.	.
2.600	0.5221	2.56	.QV	.	.	.	.
2.617	0.5256	2.56	.QV	.	.	.	.
2.633	0.5291	2.56	.QV	.	.	.	.
2.650	0.5327	2.56	.QV	.	.	.	.
2.667	0.5362	2.56	.QV	.	.	.	.
2.683	0.5397	2.57	.QV	.	.	.	.
2.700	0.5433	2.57	.QV	.	.	.	.

2.717	0.5468	2.57	.QV	.	.	.	.
2.733	0.5503	2.57	.QV	.	.	.	.
2.750	0.5539	2.57	.QV	.	.	.	.
2.767	0.5574	2.58	.QV	.	.	.	.
2.783	0.5610	2.58	.QV	.	.	.	.
2.800	0.5645	2.58	.QV	.	.	.	.
2.817	0.5681	2.58	.QV	.	.	.	.
2.833	0.5717	2.58	.QV	.	.	.	.
2.850	0.5752	2.58	.QV	.	.	.	.
2.867	0.5788	2.58	.QV	.	.	.	.
2.883	0.5823	2.59	.QV	.	.	.	.
2.900	0.5859	2.59	.QV	.	.	.	.
2.917	0.5895	2.59	.QV	.	.	.	.
2.933	0.5930	2.59	.QV	.	.	.	.
2.950	0.5966	2.59	.QV	.	.	.	.
2.967	0.6002	2.59	.QV	.	.	.	.
2.983	0.6037	2.59	.QV	.	.	.	.
3.000	0.6073	2.59	.QV	.	.	.	.
3.017	0.6109	2.60	.QV	.	.	.	.
3.033	0.6145	2.60	.QV	.	.	.	.
3.050	0.6180	2.60	.QV	.	.	.	.
3.067	0.6216	2.60	.QV	.	.	.	.
3.083	0.6252	2.60	.QV	.	.	.	.
3.100	0.6288	2.61	.QV	.	.	.	.
3.117	0.6324	2.61	.QV	.	.	.	.
3.133	0.6360	2.61	.QV	.	.	.	.
3.150	0.6396	2.61	.Q V	.	.	.	.
3.167	0.6432	2.61	.Q V	.	.	.	.
3.183	0.6468	2.61	.Q V	.	.	.	.
3.200	0.6504	2.61	.Q V	.	.	.	.
3.217	0.6540	2.61	.Q V	.	.	.	.
3.233	0.6576	2.61	.Q V	.	.	.	.
3.250	0.6612	2.62	.Q V	.	.	.	.
3.267	0.6648	2.62	.Q V	.	.	.	.
3.283	0.6684	2.62	.Q V	.	.	.	.
3.300	0.6720	2.62	.Q V	.	.	.	.
3.317	0.6756	2.62	.Q V	.	.	.	.
3.333	0.6792	2.62	.Q V	.	.	.	.
3.350	0.6828	2.63	.Q V	.	.	.	.
3.367	0.6864	2.63	.Q V	.	.	.	.
3.383	0.6901	2.63	.Q V	.	.	.	.
3.400	0.6937	2.63	.Q V	.	.	.	.
3.417	0.6973	2.63	.Q V	.	.	.	.
3.433	0.7010	2.64	.Q V	.	.	.	.
3.450	0.7046	2.64	.Q V	.	.	.	.
3.467	0.7082	2.64	.Q V	.	.	.	.
3.483	0.7119	2.64	.Q V	.	.	.	.
3.500	0.7155	2.64	.Q V	.	.	.	.
3.517	0.7191	2.64	.Q V	.	.	.	.
3.533	0.7228	2.64	.Q V	.	.	.	.
3.550	0.7264	2.64	.Q V	.	.	.	.
3.567	0.7300	2.64	.Q V	.	.	.	.
3.583	0.7337	2.64	.Q V	.	.	.	.
3.600	0.7373	2.65	.Q V	.	.	.	.
3.617	0.7410	2.65	.Q V	.	.	.	.
3.633	0.7446	2.65	.Q V	.	.	.	.
3.650	0.7483	2.65	.Q V	.	.	.	.
3.667	0.7519	2.66	.Q V	.	.	.	.
3.683	0.7556	2.66	.Q V	.	.	.	.
3.700	0.7593	2.66	.Q V	.	.	.	.
3.717	0.7629	2.66	.Q V	.	.	.	.
3.733	0.7666	2.66	.Q V	.	.	.	.
3.750	0.7703	2.66	.Q V	.	.	.	.
3.767	0.7739	2.66	.Q V	.	.	.	.
3.783	0.7776	2.67	.Q V	.	.	.	.
3.800	0.7813	2.67	.Q V	.	.	.	.
3.817	0.7850	2.67	.Q V	.	.	.	.
3.833	0.7886	2.67	.Q V	.	.	.	.
3.850	0.7923	2.67	.Q V	.	.	.	.
3.867	0.7960	2.67	.Q V	.	.	.	.
3.883	0.7997	2.67	.Q V	.	.	.	.
3.900	0.8034	2.68	.Q V	.	.	.	.
3.917	0.8070	2.68	.Q V	.	.	.	.
3.933	0.8107	2.68	.Q V	.	.	.	.
3.950	0.8144	2.68	.Q V	.	.	.	.
3.967	0.8181	2.68	.Q V	.	.	.	.
3.983	0.8218	2.69	.Q V	.	.	.	.
4.000	0.8255	2.69	.Q V	.	.	.	.
4.017	0.8292	2.69	.Q V	.	.	.	.

4.033	0.8329	2.69	.Q V	.	.	.	.
4.050	0.8367	2.69	.Q V	.	.	.	.
4.067	0.8404	2.69	.Q V	.	.	.	.
4.083	0.8441	2.69	.Q V	.	.	.	.
4.100	0.8478	2.70	.Q V	.	.	.	.
4.117	0.8515	2.70	.Q V	.	.	.	.
4.133	0.8552	2.70	.Q V	.	.	.	.
4.150	0.8589	2.70	.Q V	.	.	.	.
4.167	0.8627	2.70	.Q V	.	.	.	.
4.183	0.8664	2.70	.Q V	.	.	.	.
4.200	0.8701	2.70	.Q V	.	.	.	.
4.217	0.8738	2.71	.Q V	.	.	.	.
4.233	0.8776	2.71	.Q V	.	.	.	.
4.250	0.8813	2.71	.Q V	.	.	.	.
4.267	0.8850	2.71	.Q V	.	.	.	.
4.283	0.8888	2.71	.Q V	.	.	.	.
4.300	0.8925	2.72	.Q V	.	.	.	.
4.317	0.8963	2.72	.Q V	.	.	.	.
4.333	0.9000	2.72	.Q V	.	.	.	.
4.350	0.9038	2.72	.Q V	.	.	.	.
4.367	0.9075	2.72	.Q V	.	.	.	.
4.383	0.9113	2.72	.Q V	.	.	.	.
4.400	0.9150	2.73	.Q V	.	.	.	.
4.417	0.9188	2.73	.Q V	.	.	.	.
4.433	0.9225	2.73	.Q V	.	.	.	.
4.450	0.9263	2.73	.Q V	.	.	.	.
4.467	0.9300	2.73	.Q V	.	.	.	.
4.483	0.9338	2.73	.Q V	.	.	.	.
4.500	0.9376	2.73	.Q V	.	.	.	.
4.517	0.9413	2.74	.Q V	.	.	.	.
4.533	0.9451	2.74	.Q V	.	.	.	.
4.550	0.9489	2.74	.Q V	.	.	.	.
4.567	0.9527	2.74	.Q V	.	.	.	.
4.583	0.9565	2.75	.Q V	.	.	.	.
4.600	0.9602	2.75	.Q V	.	.	.	.
4.617	0.9640	2.75	.Q V	.	.	.	.
4.633	0.9678	2.75	.Q V	.	.	.	.
4.650	0.9716	2.75	.Q V	.	.	.	.
4.667	0.9754	2.75	.Q V	.	.	.	.
4.683	0.9792	2.76	.Q V	.	.	.	.
4.700	0.9830	2.76	.Q V	.	.	.	.
4.717	0.9868	2.76	.Q V	.	.	.	.
4.733	0.9906	2.76	.Q V	.	.	.	.
4.750	0.9944	2.76	.Q V	.	.	.	.
4.767	0.9982	2.76	.Q V	.	.	.	.
4.783	1.0020	2.76	.Q V	.	.	.	.
4.800	1.0058	2.77	.Q V	.	.	.	.
4.817	1.0096	2.77	.Q V	.	.	.	.
4.833	1.0134	2.77	.Q V	.	.	.	.
4.850	1.0173	2.77	.Q V	.	.	.	.
4.867	1.0211	2.77	.Q V	.	.	.	.
4.883	1.0249	2.78	.Q V	.	.	.	.
4.900	1.0287	2.78	.Q V	.	.	.	.
4.917	1.0326	2.78	.Q V	.	.	.	.
4.933	1.0364	2.78	.Q V	.	.	.	.
4.950	1.0402	2.79	.Q V	.	.	.	.
4.967	1.0441	2.79	.Q V	.	.	.	.
4.983	1.0479	2.79	.Q V	.	.	.	.
5.000	1.0518	2.79	.Q V	.	.	.	.
5.017	1.0556	2.79	.Q V	.	.	.	.
5.033	1.0594	2.79	.Q V	.	.	.	.
5.050	1.0633	2.79	.Q V	.	.	.	.
5.067	1.0671	2.79	.Q V	.	.	.	.
5.083	1.0710	2.80	.Q V	.	.	.	.
5.100	1.0748	2.80	.Q V	.	.	.	.
5.117	1.0787	2.80	.Q V	.	.	.	.
5.133	1.0826	2.80	.Q V	.	.	.	.
5.150	1.0864	2.80	.Q V	.	.	.	.
5.167	1.0903	2.81	.Q V	.	.	.	.
5.183	1.0942	2.81	.Q V	.	.	.	.
5.200	1.0980	2.81	.Q V	.	.	.	.
5.217	1.1019	2.81	.Q V	.	.	.	.
5.233	1.1058	2.82	.Q V	.	.	.	.
5.250	1.1097	2.82	.Q V	.	.	.	.
5.267	1.1136	2.82	.Q V	.	.	.	.
5.283	1.1175	2.82	.Q V	.	.	.	.
5.300	1.1213	2.82	.Q V	.	.	.	.
5.317	1.1252	2.82	.Q V	.	.	.	.
5.333	1.1291	2.83	.Q V	.	.	.	.

5.350	1.1330	2.83	.Q	V	.	.	.	.
5.367	1.1369	2.83	.Q	V	.	.	.	.
5.383	1.1408	2.83	.Q	V	.	.	.	.
5.400	1.1447	2.83	.Q	V	.	.	.	.
5.417	1.1486	2.83	.Q	V	.	.	.	.
5.433	1.1525	2.84	.Q	V	.	.	.	.
5.450	1.1564	2.84	.Q	V	.	.	.	.
5.467	1.1603	2.84	.Q	V	.	.	.	.
5.483	1.1643	2.84	.Q	V	.	.	.	.
5.500	1.1682	2.85	.Q	V	.	.	.	.
5.517	1.1721	2.85	.Q	V	.	.	.	.
5.533	1.1760	2.85	.Q	V	.	.	.	.
5.550	1.1800	2.85	.Q	V	.	.	.	.
5.567	1.1839	2.85	.Q	V	.	.	.	.
5.583	1.1878	2.86	.Q	V	.	.	.	.
5.600	1.1918	2.86	.Q	V	.	.	.	.
5.617	1.1957	2.86	.Q	V	.	.	.	.
5.633	1.1996	2.86	.Q	V	.	.	.	.
5.650	1.2036	2.86	.Q	V	.	.	.	.
5.667	1.2075	2.86	.Q	V	.	.	.	.
5.683	1.2115	2.86	.Q	V	.	.	.	.
5.700	1.2154	2.87	.Q	V	.	.	.	.
5.717	1.2194	2.87	.Q	V	.	.	.	.
5.733	1.2233	2.87	.Q	V	.	.	.	.
5.750	1.2273	2.87	.Q	V	.	.	.	.
5.767	1.2312	2.88	.Q	V	.	.	.	.
5.783	1.2352	2.88	.Q	V	.	.	.	.
5.800	1.2392	2.88	.Q	V	.	.	.	.
5.817	1.2432	2.88	.Q	V	.	.	.	.
5.833	1.2471	2.89	.Q	V	.	.	.	.
5.850	1.2511	2.89	.Q	V	.	.	.	.
5.867	1.2551	2.89	.Q	V	.	.	.	.
5.883	1.2591	2.89	.Q	V	.	.	.	.
5.900	1.2631	2.89	.Q	V	.	.	.	.
5.917	1.2671	2.90	.Q	V	.	.	.	.
5.933	1.2710	2.90	.Q	V	.	.	.	.
5.950	1.2750	2.90	.Q	V	.	.	.	.
5.967	1.2790	2.90	.Q	V	.	.	.	.
5.983	1.2830	2.90	.Q	V	.	.	.	.
6.000	1.2870	2.90	.Q	V	.	.	.	.
6.017	1.2910	2.91	.Q	V	.	.	.	.
6.033	1.2950	2.91	.Q	V	.	.	.	.
6.050	1.2990	2.91	.Q	V	.	.	.	.
6.067	1.3031	2.91	.Q	V	.	.	.	.
6.083	1.3071	2.92	.Q	V	.	.	.	.
6.100	1.3111	2.92	.Q	V	.	.	.	.
6.117	1.3151	2.92	.Q	V	.	.	.	.
6.133	1.3191	2.92	.Q	V	.	.	.	.
6.150	1.3232	2.93	.Q	V	.	.	.	.
6.167	1.3272	2.93	.Q	V	.	.	.	.
6.183	1.3312	2.93	.Q	V	.	.	.	.
6.200	1.3353	2.93	.Q	V	.	.	.	.
6.217	1.3393	2.93	.Q	V	.	.	.	.
6.233	1.3434	2.93	.Q	V	.	.	.	.
6.250	1.3474	2.94	.Q	V	.	.	.	.
6.267	1.3515	2.94	.Q	V	.	.	.	.
6.283	1.3555	2.94	.Q	V	.	.	.	.
6.300	1.3596	2.94	.Q	V	.	.	.	.
6.317	1.3636	2.94	.Q	V	.	.	.	.
6.333	1.3677	2.95	.Q	V	.	.	.	.
6.350	1.3717	2.95	.Q	V	.	.	.	.
6.367	1.3758	2.95	.Q	V	.	.	.	.
6.383	1.3799	2.95	.Q	V	.	.	.	.
6.400	1.3839	2.96	.Q	V	.	.	.	.
6.417	1.3880	2.96	.Q	V	.	.	.	.
6.433	1.3921	2.96	.Q	V	.	.	.	.
6.450	1.3962	2.97	.Q	V	.	.	.	.
6.467	1.4003	2.97	.Q	V	.	.	.	.
6.483	1.4044	2.97	.Q	V	.	.	.	.
6.500	1.4085	2.97	.Q	V	.	.	.	.
6.517	1.4126	2.97	. Q	V	.	.	.	.
6.533	1.4167	2.97	. Q	V	.	.	.	.
6.550	1.4208	2.98	. Q	V	.	.	.	.
6.567	1.4249	2.98	. Q	V	.	.	.	.
6.583	1.4290	2.98	. Q	V	.	.	.	.
6.600	1.4331	2.98	. Q	V	.	.	.	.
6.617	1.4372	2.98	. Q	V	.	.	.	.
6.633	1.4413	2.99	. Q	V	.	.	.	.
6.650	1.4454	2.99	. Q	V	.	.	.	.

6.667	1.4495	2.99	.	Q	V	.	.	.	.
6.683	1.4536	3.00	.	Q	V	.	.	.	.
6.700	1.4578	3.00	.	Q	V	.	.	.	.
6.717	1.4619	3.00	.	Q	V	.	.	.	.
6.733	1.4661	3.00	.	Q	V	.	.	.	.
6.750	1.4702	3.01	.	Q	V	.	.	.	.
6.767	1.4743	3.01	.	Q	V	.	.	.	.
6.783	1.4785	3.01	.	Q	V	.	.	.	.
6.800	1.4826	3.01	.	Q	V	.	.	.	.
6.817	1.4868	3.01	.	Q	V	.	.	.	.
6.833	1.4909	3.02	.	Q	V	.	.	.	.
6.850	1.4951	3.02	.	Q	V	.	.	.	.
6.867	1.4993	3.02	.	Q	V	.	.	.	.
6.883	1.5034	3.02	.	Q	V	.	.	.	.
6.900	1.5076	3.02	.	Q	V	.	.	.	.
6.917	1.5117	3.02	.	Q	V	.	.	.	.
6.933	1.5159	3.03	.	Q	V	.	.	.	.
6.950	1.5201	3.03	.	Q	V	.	.	.	.
6.967	1.5243	3.03	.	Q	V	.	.	.	.
6.983	1.5285	3.04	.	Q	V	.	.	.	.
7.000	1.5326	3.04	.	Q	V	.	.	.	.
7.017	1.5368	3.04	.	Q	V	.	.	.	.
7.033	1.5410	3.05	.	Q	V	.	.	.	.
7.050	1.5452	3.05	.	Q	V	.	.	.	.
7.067	1.5494	3.05	.	Q	V	.	.	.	.
7.083	1.5536	3.05	.	Q	V	.	.	.	.
7.100	1.5579	3.06	.	Q	V	.	.	.	.
7.117	1.5621	3.06	.	Q	V	.	.	.	.
7.133	1.5663	3.06	.	Q	V	.	.	.	.
7.150	1.5705	3.06	.	Q	V	.	.	.	.
7.167	1.5747	3.06	.	Q	V	.	.	.	.
7.183	1.5789	3.06	.	Q	V	.	.	.	.
7.200	1.5832	3.07	.	Q	V	.	.	.	.
7.217	1.5874	3.07	.	Q	V	.	.	.	.
7.233	1.5916	3.07	.	Q	V	.	.	.	.
7.250	1.5959	3.08	.	Q	V	.	.	.	.
7.267	1.6001	3.08	.	Q	V	.	.	.	.
7.283	1.6043	3.08	.	Q	V	.	.	.	.
7.300	1.6086	3.09	.	Q	V	.	.	.	.
7.317	1.6128	3.09	.	Q	V	.	.	.	.
7.333	1.6171	3.09	.	Q	V	.	.	.	.
7.350	1.6214	3.10	.	Q	V	.	.	.	.
7.367	1.6256	3.10	.	Q	V	.	.	.	.
7.383	1.6299	3.10	.	Q	V	.	.	.	.
7.400	1.6342	3.10	.	Q	V	.	.	.	.
7.417	1.6385	3.10	.	Q	V	.	.	.	.
7.433	1.6427	3.11	.	Q	V	.	.	.	.
7.450	1.6470	3.11	.	Q	V	.	.	.	.
7.467	1.6513	3.11	.	Q	V	.	.	.	.
7.483	1.6556	3.11	.	Q	V	.	.	.	.
7.500	1.6599	3.11	.	Q	V	.	.	.	.
7.517	1.6642	3.11	.	Q	V	.	.	.	.
7.533	1.6684	3.12	.	Q	V	.	.	.	.
7.550	1.6727	3.12	.	Q	V	.	.	.	.
7.567	1.6771	3.12	.	Q	V	.	.	.	.
7.583	1.6814	3.13	.	Q	V	.	.	.	.
7.600	1.6857	3.13	.	Q	V	.	.	.	.
7.617	1.6900	3.14	.	Q	V	.	.	.	.
7.633	1.6943	3.14	.	Q	V	.	.	.	.
7.650	1.6986	3.14	.	Q	V	.	.	.	.
7.667	1.7030	3.15	.	Q	V	.	.	.	.
7.683	1.7073	3.15	.	Q	V	.	.	.	.
7.700	1.7117	3.15	.	Q	V	.	.	.	.
7.717	1.7160	3.15	.	Q	V	.	.	.	.
7.733	1.7203	3.15	.	Q	V	.	.	.	.
7.750	1.7247	3.16	.	Q	V	.	.	.	.
7.767	1.7290	3.16	.	Q	V	.	.	.	.
7.783	1.7334	3.16	.	Q	V	.	.	.	.
7.800	1.7377	3.16	.	Q	V	.	.	.	.
7.817	1.7421	3.16	.	Q	V	.	.	.	.
7.833	1.7465	3.17	.	Q	V	.	.	.	.
7.850	1.7508	3.17	.	Q	V	.	.	.	.
7.867	1.7552	3.17	.	Q	V	.	.	.	.
7.883	1.7596	3.18	.	Q	V	.	.	.	.
7.900	1.7639	3.18	.	Q	V	.	.	.	.
7.917	1.7683	3.18	.	Q	V	.	.	.	.
7.933	1.7727	3.19	.	Q	V	.	.	.	.
7.950	1.7771	3.19	.	Q	V	.	.	.	.
7.967	1.7815	3.20	.	Q	V	.	.	.	.

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7.983      1.7859      3.20  . Q     V .         .         .         .
8.000      1.7903      3.20  . Q     V .         .         .         .
8.017      1.7947      3.20  . Q     V .         .         .         .
8.033      1.7992      3.20  . Q     V .         .         .         .
8.050      1.8036      3.21  . Q     V .         .         .         .
8.067      1.8080      3.21  . Q     V .         .         .         .
8.083      1.8124      3.21  . Q     V .         .         .         .
8.100      1.8168      3.21  . Q     V .         .         .         .
8.117      1.8213      3.21  . Q     V .         .         .         .
8.133      1.8257      3.22  . Q     V .         .         .         .
8.150      1.8301      3.22  . Q     V .         .         .         .
8.167      1.8346      3.22  . Q     V .         .         .         .
8.183      1.8390      3.23  . Q     V .         .         .         .
8.200      1.8435      3.23  . Q     V .         .         .         .
8.217      1.8479      3.24  . Q     V .         .         .         .
8.233      1.8524      3.24  . Q     V .         .         .         .
8.250      1.8569      3.24  . Q     V .         .         .         .
8.267      1.8613      3.25  . Q     V .         .         .         .
8.283      1.8658      3.25  . Q     V .         .         .         .
8.300      1.8703      3.25  . Q     V .         .         .         .
8.317      1.8748      3.26  . Q     V .         .         .         .
8.333      1.8793      3.26  . Q     V .         .         .         .
8.350      1.8838      3.26  . Q     V .         .         .         .
8.367      1.8883      3.26  . Q     V .         .         .         .
8.383      1.8927      3.26  . Q     V .         .         .         .
8.400      1.8972      3.27  . Q     V .         .         .         .
8.417      1.9017      3.27  . Q     V .         .         .         .
8.433      1.9063      3.27  . Q     V .         .         .         .
8.450      1.9108      3.27  . Q     V .         .         .         .
8.467      1.9153      3.28  . Q     V .         .         .         .
8.483      1.9198      3.28  . Q      V.         .         .         .
8.500      1.9243      3.29  . Q      V.         .         .         .
8.517      1.9289      3.29  . Q      V.         .         .         .
8.533      1.9334      3.30  . Q      V.         .         .         .
8.550      1.9379      3.30  . Q      V.         .         .         .
8.567      1.9425      3.30  . Q      V.         .         .         .
8.583      1.9471      3.31  . Q      V.         .         .         .
8.600      1.9516      3.31  . Q      V.         .         .         .
8.617      1.9562      3.31  . Q      V.         .         .         .
8.633      1.9607      3.31  . Q      V.         .         .         .
8.650      1.9653      3.32  . Q      V.         .         .         .
8.667      1.9699      3.32  . Q      V.         .         .         .
8.683      1.9744      3.32  . Q      V.         .         .         .
8.700      1.9790      3.32  . Q      V.         .         .         .
8.717      1.9836      3.32  . Q      V.         .         .         .
8.733      1.9882      3.33  . Q      V.         .         .         .
8.750      1.9928      3.33  . Q      V.         .         .         .
8.767      1.9974      3.34  . Q      V.         .         .         .
8.783      2.0020      3.34  . Q      V.         .         .         .
8.800      2.0066      3.34  . Q      V.         .         .         .
8.817      2.0112      3.35  . Q      V.         .         .         .
8.833      2.0158      3.35  . Q      V.         .         .         .
8.850      2.0204      3.36  . Q      V.         .         .         .
8.867      2.0251      3.36  . Q      V.         .         .         .
8.883      2.0297      3.37  . Q      V.         .         .         .
8.900      2.0343      3.37  . Q      V.         .         .         .
8.917      2.0390      3.37  . Q      V.         .         .         .
8.933      2.0436      3.37  . Q      V.         .         .         .
8.950      2.0483      3.38  . Q      V.         .         .         .
8.967      2.0529      3.38  . Q      V.         .         .         .
8.983      2.0576      3.38  . Q      V.         .         .         .
9.000      2.0622      3.38  . Q      V.         .         .         .
9.017      2.0669      3.38  . Q      V.         .         .         .
9.033      2.0716      3.39  . Q      V.         .         .         .
9.050      2.0762      3.39  . Q      V.         .         .         .
9.067      2.0809      3.40  . Q      V.         .         .         .
9.083      2.0856      3.40  . Q      V.         .         .         .
9.100      2.0903      3.41  . Q      V.         .         .         .
9.117      2.0950      3.41  . Q      V.         .         .         .
9.133      2.0997      3.42  . Q      V.         .         .         .
9.150      2.1044      3.42  . Q      V.         .         .         .
9.167      2.1091      3.42  . Q      V.         .         .         .
9.183      2.1139      3.43  . Q      V.         .         .         .
9.200      2.1186      3.43  . Q      V.         .         .         .
9.217      2.1233      3.43  . Q      V.         .         .         .
9.233      2.1280      3.44  . Q      V.         .         .         .
9.250      2.1328      3.44  . Q       V         .         .         .
9.267      2.1375      3.44  . Q       V         .         .         .
9.283      2.1423      3.44  . Q       V         .         .         .
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9.300	2.1470	3.45	.	Q	V	.	.	.
9.317	2.1518	3.45	.	Q	V	.	.	.
9.333	2.1565	3.45	.	Q	V	.	.	.
9.350	2.1613	3.46	.	Q	V	.	.	.
9.367	2.1660	3.46	.	Q	V	.	.	.
9.383	2.1708	3.47	.	Q	V	.	.	.
9.400	2.1756	3.47	.	Q	V	.	.	.
9.417	2.1804	3.48	.	Q	V	.	.	.
9.433	2.1852	3.48	.	Q	V	.	.	.
9.450	2.1900	3.49	.	Q	V	.	.	.
9.467	2.1948	3.49	.	Q	V	.	.	.
9.483	2.1996	3.50	.	Q	V	.	.	.
9.500	2.2044	3.50	.	Q	V	.	.	.
9.517	2.2093	3.50	.	Q	V	.	.	.
9.533	2.2141	3.50	.	Q	V	.	.	.
9.550	2.2189	3.51	.	Q	V	.	.	.
9.567	2.2237	3.51	.	Q	V	.	.	.
9.583	2.2286	3.51	.	Q	V	.	.	.
9.600	2.2334	3.51	.	Q	V	.	.	.
9.617	2.2383	3.52	.	Q	V	.	.	.
9.633	2.2431	3.52	.	Q	V	.	.	.
9.650	2.2480	3.52	.	Q	V	.	.	.
9.667	2.2528	3.53	.	Q	V	.	.	.
9.683	2.2577	3.54	.	Q	V	.	.	.
9.700	2.2626	3.54	.	Q	V	.	.	.
9.717	2.2675	3.55	.	Q	V	.	.	.
9.733	2.2724	3.55	.	Q	V	.	.	.
9.750	2.2773	3.56	.	Q	V	.	.	.
9.767	2.2822	3.56	.	Q	V	.	.	.
9.783	2.2871	3.57	.	Q	V	.	.	.
9.800	2.2920	3.57	.	Q	V	.	.	.
9.817	2.2969	3.57	.	Q	V	.	.	.
9.833	2.3018	3.58	.	Q	V	.	.	.
9.850	2.3068	3.58	.	Q	V	.	.	.
9.867	2.3117	3.58	.	Q	V	.	.	.
9.883	2.3166	3.58	.	Q	V	.	.	.
9.900	2.3216	3.59	.	Q	V	.	.	.
9.917	2.3265	3.59	.	Q	V	.	.	.
9.933	2.3315	3.59	.	Q	V	.	.	.
9.950	2.3364	3.60	.	Q	V	.	.	.
9.967	2.3414	3.60	.	Q	.V	.	.	.
9.983	2.3464	3.61	.	Q	.V	.	.	.
10.000	2.3513	3.61	.	Q	.V	.	.	.
10.017	2.3563	3.62	.	Q	.V	.	.	.
10.033	2.3613	3.63	.	Q	.V	.	.	.
10.050	2.3663	3.63	.	Q	.V	.	.	.
10.067	2.3713	3.64	.	Q	.V	.	.	.
10.083	2.3764	3.64	.	Q	.V	.	.	.
10.100	2.3814	3.65	.	Q	.V	.	.	.
10.117	2.3864	3.65	.	Q	.V	.	.	.
10.133	2.3914	3.65	.	Q	.V	.	.	.
10.150	2.3965	3.66	.	Q	.V	.	.	.
10.167	2.4015	3.66	.	Q	.V	.	.	.
10.183	2.4066	3.66	.	Q	.V	.	.	.
10.200	2.4116	3.67	.	Q	.V	.	.	.
10.217	2.4167	3.67	.	Q	.V	.	.	.
10.233	2.4217	3.67	.	Q	.V	.	.	.
10.250	2.4268	3.68	.	Q	.V	.	.	.
10.267	2.4319	3.68	.	Q	.V	.	.	.
10.283	2.4369	3.69	.	Q	.V	.	.	.
10.300	2.4420	3.69	.	Q	.V	.	.	.
10.317	2.4471	3.70	.	Q	.V	.	.	.
10.333	2.4522	3.71	.	Q	.V	.	.	.
10.350	2.4573	3.71	.	Q	.V	.	.	.
10.367	2.4625	3.72	.	Q	.V	.	.	.
10.383	2.4676	3.72	.	Q	.V	.	.	.
10.400	2.4727	3.73	.	Q	.V	.	.	.
10.417	2.4779	3.73	.	Q	.V	.	.	.
10.433	2.4830	3.74	.	Q	.V	.	.	.
10.450	2.4882	3.74	.	Q	.V	.	.	.
10.467	2.4933	3.74	.	Q	.V	.	.	.
10.483	2.4985	3.75	.	Q	.V	.	.	.
10.500	2.5037	3.75	.	Q	.V	.	.	.
10.517	2.5088	3.75	.	Q	.V	.	.	.
10.533	2.5140	3.76	.	Q	.V	.	.	.
10.550	2.5192	3.76	.	Q	.V	.	.	.
10.567	2.5244	3.77	.	Q	.V	.	.	.
10.583	2.5296	3.77	.	Q	.V	.	.	.
10.600	2.5348	3.78	.	Q	.V	.	.	.

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10.617      2.5400      3.79  . Q       .V        .         .         .
10.633      2.5452      3.79  . Q       .V        .         .         .
10.650      2.5504      3.80  . Q       .V        .         .         .
10.667      2.5557      3.81  . Q       . V       .         .         .
10.683      2.5609      3.81  . Q       . V       .         .         .
10.700      2.5662      3.82  . Q       . V       .         .         .
10.717      2.5715      3.82  . Q       . V       .         .         .
10.733      2.5767      3.83  . Q       . V       .         .         .
10.750      2.5820      3.83  . Q       . V       .         .         .
10.767      2.5873      3.83  . Q       . V       .         .         .
10.783      2.5926      3.84  . Q       . V       .         .         .
10.800      2.5979      3.84  . Q       . V       .         .         .
10.817      2.6031      3.84  . Q       . V       .         .         .
10.833      2.6084      3.85  . Q       . V       .         .         .
10.850      2.6138      3.85  . Q       . V       .         .         .
10.867      2.6191      3.86  . Q       . V       .         .         .
10.883      2.6244      3.86  . Q       . V       .         .         .
10.900      2.6297      3.87  . Q       . V       .         .         .
10.917      2.6351      3.88  . Q       . V       .         .         .
10.933      2.6404      3.89  . Q       . V       .         .         .
10.950      2.6458      3.89  . Q       . V       .         .         .
10.967      2.6512      3.90  . Q       . V       .         .         .
10.983      2.6565      3.91  . Q       . V       .         .         .
11.000      2.6619      3.91  . Q       . V       .         .         .
11.017      2.6673      3.92  . Q       . V       .         .         .
11.033      2.6727      3.92  . Q       . V       .         .         .
11.050      2.6781      3.93  . Q       . V       .         .         .
11.067      2.6836      3.93  . Q       . V       .         .         .
11.083      2.6890      3.93  . Q       . V       .         .         .
11.100      2.6944      3.94  . Q       . V       .         .         .
11.117      2.6998      3.94  . Q       . V       .         .         .
11.133      2.7053      3.95  . Q       . V       .         .         .
11.150      2.7107      3.95  . Q       . V       .         .         .
11.167      2.7162      3.96  . Q       . V       .         .         .
11.183      2.7216      3.96  . Q       . V       .         .         .
11.200      2.7271      3.97  . Q       . V       .         .         .
11.217      2.7326      3.98  . Q       . V       .         .         .
11.233      2.7381      3.99  . Q       . V       .         .         .
11.250      2.7436      4.00  . Q       . V       .         .         .
11.267      2.7491      4.00  . Q       . V       .         .         .
11.283      2.7546      4.01  . Q       . V       .         .         .
11.300      2.7601      4.02  . Q       . V       .         .         .
11.317      2.7657      4.02  . Q       . V       .         .         .
11.333      2.7712      4.03  . Q       .  V      .         .         .
11.350      2.7768      4.03  . Q       .  V      .         .         .
11.367      2.7824      4.04  . Q       .  V      .         .         .
11.383      2.7879      4.04  . Q       .  V      .         .         .
11.400      2.7935      4.05  . Q       .  V      .         .         .
11.417      2.7991      4.05  . Q       .  V      .         .         .
11.433      2.8047      4.05  . Q       .  V      .         .         .
11.450      2.8102      4.06  . Q       .  V      .         .         .
11.467      2.8158      4.06  . Q       .  V      .         .         .
11.483      2.8214      4.07  . Q       .  V      .         .         .
11.500      2.8271      4.08  . Q       .  V      .         .         .
11.517      2.8327      4.09  . Q       .  V      .         .         .
11.533      2.8384      4.10  . Q       .  V      .         .         .
11.550      2.8440      4.11  . Q       .  V      .         .         .
11.567      2.8497      4.12  . Q       .  V      .         .         .
11.583      2.8554      4.12  . Q       .  V      .         .         .
11.600      2.8611      4.13  . Q       .  V      .         .         .
11.617      2.8668      4.14  . Q       .  V      .         .         .
11.633      2.8725      4.14  . Q       .  V      .         .         .
11.650      2.8782      4.15  . Q       .  V      .         .         .
11.667      2.8839      4.15  . Q       .  V      .         .         .
11.683      2.8896      4.16  . Q       .  V      .         .         .
11.700      2.8954      4.16  . Q       .  V      .         .         .
11.717      2.9011      4.17  . Q       .  V      .         .         .
11.733      2.9069      4.17  . Q       .  V      .         .         .
11.750      2.9126      4.18  . Q       .  V      .         .         .
11.767      2.9184      4.18  . Q       .  V      .         .         .
11.783      2.9241      4.19  . Q       .  V      .         .         .
11.800      2.9299      4.20  . Q       .  V      .         .         .
11.817      2.9357      4.21  . Q       .  V      .         .         .
11.833      2.9415      4.22  . Q       .  V      .         .         .
11.850      2.9474      4.23  . Q       .  V      .         .         .
11.867      2.9532      4.24  . Q       .  V      .         .         .
11.883      2.9591      4.25  . Q       .  V      .         .         .
11.900      2.9649      4.26  . Q       .  V      .         .         .
11.917      2.9708      4.27  . Q       .  V      .         .         .
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11.933      2.9767      4.27  . Q       .  V      .         .         .
11.950      2.9826      4.28  . Q       .   V     .         .         .
11.967      2.9885      4.28  . Q       .   V     .         .         .
11.983      2.9944      4.29  . Q       .   V     .         .         .
12.000      3.0003      4.29  . Q       .   V     .         .         .
12.017      3.0062      4.30  . Q       .   V     .         .         .
12.033      3.0121      4.30  . Q       .   V     .         .         .
12.050      3.0181      4.31  . Q       .   V     .         .         .
12.067      3.0240      4.32  . Q       .   V     .         .         .
12.083      3.0300      4.34  . Q       .   V     .         .         .
12.100      3.0360      4.37  . Q       .   V     .         .         .
12.117      3.0421      4.40  . Q       .   V     .         .         .
12.133      3.0482      4.43  . Q       .   V     .         .         .
12.150      3.0543      4.45  . Q       .   V     .         .         .
12.167      3.0605      4.48  .  Q      .   V     .         .         .
12.183      3.0667      4.51  .  Q      .   V     .         .         .
12.200      3.0729      4.54  .  Q      .   V     .         .         .
12.217      3.0792      4.56  .  Q      .   V     .         .         .
12.233      3.0855      4.57  .  Q      .   V     .         .         .
12.250      3.0918      4.58  .  Q      .   V     .         .         .
12.267      3.0981      4.58  .  Q      .   V     .         .         .
12.283      3.1045      4.59  .  Q      .   V     .         .         .
12.300      3.1108      4.59  .  Q      .   V     .         .         .
12.317      3.1171      4.60  .  Q      .   V     .         .         .
12.333      3.1235      4.60  .  Q      .   V     .         .         .
12.350      3.1298      4.61  .  Q      .   V     .         .         .
12.367      3.1362      4.62  .  Q      .   V     .         .         .
12.383      3.1426      4.63  .  Q      .   V     .         .         .
12.400      3.1489      4.64  .  Q      .   V     .         .         .
12.417      3.1554      4.65  .  Q      .   V     .         .         .
12.433      3.1618      4.66  .  Q      .   V     .         .         .
12.450      3.1682      4.67  .  Q      .   V     .         .         .
12.467      3.1747      4.69  .  Q      .   V     .         .         .
12.483      3.1811      4.70  .  Q      .   V     .         .         .
12.500      3.1876      4.71  .  Q      .   V     .         .         .
12.517      3.1941      4.72  .  Q      .    V    .         .         .
12.533      3.2006      4.73  .  Q      .    V    .         .         .
12.550      3.2072      4.73  .  Q      .    V    .         .         .
12.567      3.2137      4.74  .  Q      .    V    .         .         .
12.583      3.2202      4.75  .  Q      .    V    .         .         .
12.600      3.2268      4.75  .  Q      .    V    .         .         .
12.617      3.2333      4.76  .  Q      .    V    .         .         .
12.633      3.2399      4.76  .  Q      .    V    .         .         .
12.650      3.2465      4.77  .  Q      .    V    .         .         .
12.667      3.2530      4.78  .  Q      .    V    .         .         .
12.683      3.2596      4.79  .  Q      .    V    .         .         .
12.700      3.2662      4.80  .  Q      .    V    .         .         .
12.717      3.2729      4.81  .  Q      .    V    .         .         .
12.733      3.2795      4.83  .  Q      .    V    .         .         .
12.750      3.2862      4.84  .  Q      .    V    .         .         .
12.767      3.2929      4.85  .  Q      .    V    .         .         .
12.783      3.2996      4.87  .  Q      .    V    .         .         .
12.800      3.3063      4.88  .  Q      .    V    .         .         .
12.817      3.3130      4.89  .  Q      .    V    .         .         .
12.833      3.3198      4.90  .  Q      .    V    .         .         .
12.850      3.3266      4.91  .  Q      .    V    .         .         .
12.867      3.3333      4.92  .  Q      .    V    .         .         .
12.883      3.3401      4.92  .  Q      .    V    .         .         .
12.900      3.3469      4.93  .  Q      .    V    .         .         .
12.917      3.3537      4.94  .  Q      .    V    .         .         .
12.933      3.3605      4.95  .  Q      .    V    .         .         .
12.950      3.3673      4.95  .  Q      .    V    .         .         .
12.967      3.3742      4.96  .  Q      .    V    .         .         .
12.983      3.3810      4.97  .  Q      .    V    .         .         .
13.000      3.3879      4.99  .  Q      .    V    .         .         .
13.017      3.3948      5.00  .  Q      .    V    .         .         .
13.033      3.4017      5.02  .  Q      .    V    .         .         .
13.050      3.4086      5.03  .  Q      .     V   .         .         .
13.067      3.4156      5.05  .  Q      .     V   .         .         .
13.083      3.4225      5.06  .  Q      .     V   .         .         .
13.100      3.4295      5.08  .  Q      .     V   .         .         .
13.117      3.4365      5.09  .  Q      .     V   .         .         .
13.133      3.4436      5.10  .  Q      .     V   .         .         .
13.150      3.4506      5.11  .  Q      .     V   .         .         .
13.167      3.4577      5.12  .  Q      .     V   .         .         .
13.183      3.4647      5.13  .  Q      .     V   .         .         .
13.200      3.4718      5.14  .  Q      .     V   .         .         .
13.217      3.4789      5.14  .  Q      .     V   .         .         .
13.233      3.4860      5.15  .  Q      .     V   .         .         .
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13.250	3.4931	5.16	.	Q	.	V	.	.	.
13.267	3.5002	5.17	.	Q	.	V	.	.	.
13.283	3.5073	5.18	.	Q	.	V	.	.	.
13.300	3.5145	5.20	.	Q	.	V	.	.	.
13.317	3.5217	5.21	.	Q	.	V	.	.	.
13.333	3.5289	5.23	.	Q	.	V	.	.	.
13.350	3.5361	5.25	.	Q	.	V	.	.	.
13.367	3.5434	5.27	.	Q	.	V	.	.	.
13.383	3.5506	5.28	.	Q	.	V	.	.	.
13.400	3.5579	5.30	.	Q	.	V	.	.	.
13.417	3.5653	5.32	.	Q	.	V	.	.	.
13.433	3.5726	5.33	.	Q	.	V	.	.	.
13.450	3.5800	5.34	.	Q	.	V	.	.	.
13.467	3.5874	5.35	.	Q	.	V	.	.	.
13.483	3.5947	5.36	.	Q	.	V	.	.	.
13.500	3.6021	5.37	.	Q	.	V	.	.	.
13.517	3.6095	5.38	.	Q	.	V	.	.	.
13.533	3.6170	5.39	.	Q	.	V	.	.	.
13.550	3.6244	5.40	.	Q	.	V	.	.	.
13.567	3.6319	5.41	.	Q	.	V	.	.	.
13.583	3.6393	5.42	.	Q	.	V	.	.	.
13.600	3.6468	5.44	.	Q	.	V	.	.	.
13.617	3.6543	5.46	.	Q	.	V	.	.	.
13.633	3.6619	5.48	.	Q	.	V	.	.	.
13.650	3.6695	5.50	.	Q	.	V	.	.	.
13.667	3.6771	5.52	.	Q	.	V	.	.	.
13.683	3.6847	5.54	.	Q	.	V	.	.	.
13.700	3.6924	5.56	.	Q	.	V	.	.	.
13.717	3.7001	5.58	.	Q	.	V	.	.	.
13.733	3.7078	5.60	.	Q	.	V	.	.	.
13.750	3.7155	5.62	.	Q	.	V	.	.	.
13.767	3.7233	5.63	.	Q	.	V	.	.	.
13.783	3.7310	5.64	.	Q	.	V	.	.	.
13.800	3.7388	5.65	.	Q	.	V	.	.	.
13.817	3.7466	5.66	.	Q	.	V	.	.	.
13.833	3.7544	5.67	.	Q	.	V	.	.	.
13.850	3.7623	5.68	.	Q	.	V	.	.	.
13.867	3.7701	5.69	.	Q	.	V	.	.	.
13.883	3.7780	5.71	.	Q	.	V	.	.	.
13.900	3.7859	5.73	.	Q	.	V	.	.	.
13.917	3.7938	5.75	.	Q	.	V	.	.	.
13.933	3.8017	5.78	.	Q	.	V	.	.	.
13.950	3.8097	5.80	.	Q	.	V	.	.	.
13.967	3.8178	5.83	.	Q	.	V	.	.	.
13.983	3.8258	5.85	.	Q	.	V	.	.	.
14.000	3.8339	5.88	.	Q	.	V	.	.	.
14.017	3.8421	5.90	.	Q	.	V	.	.	.
14.033	3.8502	5.92	.	Q	.	V	.	.	.
14.050	3.8583	5.90	.	Q	.	V	.	.	.
14.067	3.8664	5.87	.	Q	.	V	.	.	.
14.083	3.8744	5.83	.	Q	.	V	.	.	.
14.100	3.8824	5.79	.	Q	.	V	.	.	.
14.117	3.8904	5.76	.	Q	.	V	.	.	.
14.133	3.8982	5.72	.	Q	.	V	.	.	.
14.150	3.9061	5.68	.	Q	.	V	.	.	.
14.167	3.9138	5.65	.	Q	.	V	.	.	.
14.183	3.9216	5.61	.	Q	.	V	.	.	.
14.200	3.9293	5.61	.	Q	.	V	.	.	.
14.217	3.9370	5.63	.	Q	.	V	.	.	.
14.233	3.9448	5.64	.	Q	.	V	.	.	.
14.250	3.9526	5.66	.	Q	.	V	.	.	.
14.267	3.9604	5.68	.	Q	.	V	.	.	.
14.283	3.9683	5.70	.	Q	.	V	.	.	.
14.300	3.9762	5.71	.	Q	.	V	.	.	.
14.317	3.9841	5.73	.	Q	.	V	.	.	.
14.333	3.9920	5.75	.	Q	.	V	.	.	.
14.350	3.9999	5.77	.	Q	.	V	.	.	.
14.367	4.0079	5.78	.	Q	.	V	.	.	.
14.383	4.0159	5.80	.	Q	.	V	.	.	.
14.400	4.0239	5.82	.	Q	.	V	.	.	.
14.417	4.0319	5.84	.	Q	.	V	.	.	.
14.433	4.0400	5.86	.	Q	.	V	.	.	.
14.450	4.0481	5.87	.	Q	.	V	.	.	.
14.467	4.0562	5.89	.	Q	.	V	.	.	.
14.483	4.0643	5.91	.	Q	.	V	.	.	.
14.500	4.0725	5.94	.	Q	.	V	.	.	.
14.517	4.0807	5.98	.	Q	.	V	.	.	.
14.533	4.0890	6.02	.	Q	.	V	.	.	.
14.550	4.0974	6.06	.	Q	.	V	.	.	.

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14.567     4.1058     6.10  .   Q     .        V.         .         .
14.583     4.1143     6.14  .   Q     .        V.         .         .
14.600     4.1228     6.18  .   Q     .        V.         .         .
14.617     4.1313     6.22  .   Q     .        V.         .         .
14.633     4.1400     6.27  .   Q     .        V.         .         .
14.650     4.1487     6.30  .   Q     .        V.         .         .
14.667     4.1574     6.32  .   Q     .        V.         .         .
14.683     4.1661     6.35  .   Q     .        V.         .         .
14.700     4.1749     6.37  .   Q     .        V.         .         .
14.717     4.1837     6.39  .   Q     .        V.         .         .
14.733     4.1925     6.42  .   Q     .        V.         .         .
14.750     4.2014     6.44  .   Q     .        V.         .         .
14.767     4.2103     6.47  .   Q     .        V.         .         .
14.783     4.2193     6.49  .   Q     .        V.         .         .
14.800     4.2282     6.52  .   Q     .        V.         .         .
14.817     4.2373     6.58  .   Q     .        V.         .         .
14.833     4.2464     6.64  .   Q     .        V.         .         .
14.850     4.2557     6.69  .   Q     .        V.         .         .
14.867     4.2650     6.75  .   Q     .         V         .         .
14.883     4.2743     6.80  .   Q     .         V         .         .
14.900     4.2838     6.86  .   Q     .         V         .         .
14.917     4.2933     6.92  .   Q     .         V         .         .
14.933     4.3029     6.97  .   Q     .         V         .         .
14.950     4.3126     7.02  .   Q     .         V         .         .
14.967     4.3223     7.06  .   Q     .         V         .         .
14.983     4.3321     7.10  .   Q     .         V         .         .
15.000     4.3419     7.13  .   Q     .         V         .         .
15.017     4.3518     7.17  .   Q     .         V         .         .
15.033     4.3617     7.20  .   Q     .         V         .         .
15.050     4.3717     7.24  .   Q     .         V         .         .
15.067     4.3817     7.27  .   Q     .         V         .         .
15.083     4.3917     7.31  .   Q     .         V         .         .
15.100     4.4019     7.35  .   Q     .         V         .         .
15.117     4.4121     7.44  .    Q    .         V         .         .
15.133     4.4225     7.54  .    Q    .         V         .         .
15.150     4.4330     7.64  .    Q    .         V         .         .
15.167     4.4437     7.73  .    Q    .         V         .         .
15.183     4.4545     7.83  .    Q    .         V         .         .
15.200     4.4654     7.93  .    Q    .         V         .         .
15.217     4.4764     8.02  .    Q    .         .V        .         .
15.233     4.4876     8.12  .    Q    .         .V        .         .
15.250     4.4989     8.21  .    Q    .         .V        .         .
15.267     4.5103     8.28  .    Q    .         .V        .         .
15.283     4.5218     8.34  .    Q    .         .V        .         .
15.300     4.5334     8.40  .    Q    .         .V        .         .
15.317     4.5451     8.47  .    Q    .         .V        .         .
15.333     4.5568     8.53  .    Q    .         .V        .         .
15.350     4.5687     8.59  .    Q    .         .V        .         .
15.367     4.5806     8.65  .    Q    .         .V        .         .
15.383     4.5926     8.72  .    Q    .         .V        .         .
15.400     4.6047     8.77  .    Q    .         .V        .         .
15.417     4.6167     8.72  .    Q    .         .V        .         .
15.433     4.6286     8.64  .    Q    .         .V        .         .
15.450     4.6404     8.56  .    Q    .         .V        .         .
15.467     4.6520     8.49  .    Q    .         .V        .         .
15.483     4.6636     8.41  .    Q    .         .V        .         .
15.500     4.6751     8.34  .    Q    .         .V        .         .
15.517     4.6865     8.26  .    Q    .         . V       .         .
15.533     4.6978     8.19  .    Q    .         . V       .         .
15.550     4.7090     8.12  .    Q    .         . V       .         .
15.567     4.7202     8.20  .    Q    .         . V       .         .
15.583     4.7317     8.32  .    Q    .         . V       .         .
15.600     4.7433     8.45  .    Q    .         . V       .         .
15.617     4.7552     8.57  .    Q    .         . V       .         .
15.633     4.7671     8.70  .    Q    .         . V       .         .
15.650     4.7793     8.82  .    Q    .         . V       .         .
15.667     4.7916     8.95  .     Q   .         . V       .         .
15.683     4.8041     9.08  .     Q   .         . V       .         .
15.700     4.8168     9.21  .     Q   .         . V       .         .
15.717     4.8299     9.54  .     Q   .         . V       .         .
15.733     4.8437     9.97  .     Q   .         . V       .         .
15.750     4.8580    10.40  .     Q   .         . V       .         .
15.767     4.8729    10.83  .      Q  .         . V       .         .
15.783     4.8884    11.26  .      Q  .         . V       .         .
15.800     4.9045    11.69  .      Q  .         .  V      .         .
15.817     4.9212    12.12  .       Q .         .  V      .         .
15.833     4.9385    12.55  .       Q .         .  V      .         .
15.850     4.9564    12.98  .       Q .         .  V      .         .
15.867     4.9750    13.50  .        Q.         .  V      .         .
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15.883     4.9944     14.08  .        Q.         .  V      .         .
15.900     5.0146     14.67  .        Q.         .  V      .         .
15.917     5.0356     15.25  .         Q         .  V      .         .
15.933     5.0574     15.83  .         Q         .  V      .         .
15.950     5.0800     16.41  .         .Q        .  V      .         .
15.967     5.1034     16.99  .         .Q        .  V      .         .
15.983     5.1276     17.57  .         .Q        .   V     .         .
16.000     5.1526     18.16  .         . Q       .   V     .         .
16.017     5.1811     20.70  .         .  Q      .   V     .         .
16.033     5.2159     25.20  .         .    Q    .   V     .         .
16.050     5.2568     29.71  .         .       Q.   V     .         .
16.067     5.3039     34.21  .         .         .  QV     .         .
16.083     5.3572     38.72  .         .         .    VQ   .         .
16.100     5.4168     43.22  .         .         .    V   Q.         .
16.117     5.4825     47.73  .         .         .    V    . Q       .
16.133     5.5545     52.23  .         .         .     V   .    Q    .
16.150     5.6326     56.74  .         .         .     V   .       Q .
16.167     5.7145     59.44  .         .         .     V   .         Q
16.183     5.7860     51.95  .         .         .      V  .   Q     .
16.200     5.8502     46.60  .         .         .      V  .Q        .
16.217     5.9070     41.26  .         .         .      Q  .         .
16.233     5.9565     35.91  .         .         .   Q  V  .         .
16.250     5.9986     30.56  .         .         Q       V .         .
16.267     6.0333     25.22  .         .    Q    .       V .         .
16.283     6.0607     19.87  .         .  Q      .       V .         .
16.300     6.0807     14.52  .        Q.         .       V .         .
16.317     6.0956     10.79  .      Q  .         .       V .         .
16.333     6.1099     10.40  .     Q   .         .       V .         .
16.350     6.1238     10.11  .     Q   .         .       V .         .
16.367     6.1374      9.82  .     Q   .         .       V .         .
16.383     6.1505      9.53  .     Q   .         .       V .         .
16.400     6.1632      9.24  .     Q   .         .       V .         .
16.417     6.1756      8.96  .     Q   .         .        V.         .
16.433     6.1875      8.67  .    Q    .         .        V.         .
16.450     6.1990      8.38  .    Q    .         .        V.         .
16.467     6.2103      8.15  .    Q    .         .        V.         .
16.483     6.2214      8.09  .    Q    .         .        V.         .
16.500     6.2325      8.05  .    Q    .         .        V.         .
16.517     6.2435      8.00  .    Q    .         .        V.         .
16.533     6.2545      7.96  .    Q    .         .        V.         .
16.550     6.2654      7.92  .    Q    .         .        V.         .
16.567     6.2762      7.87  .    Q    .         .        V.         .
16.583     6.2870      7.83  .    Q    .         .        V.         .
16.600     6.2977      7.78  .    Q    .         .        V.         .
16.617     6.3084      7.73  .    Q    .         .        V.         .
16.633     6.3189      7.62  .    Q    .         .        V.         .
16.650     6.3292      7.51  .    Q    .         .        V.         .
16.667     6.3394      7.40  .   Q     .         .        V.         .
16.683     6.3495      7.29  .   Q     .         .        V.         .
16.700     6.3594      7.19  .   Q     .         .        V.         .
16.717     6.3691      7.08  .   Q     .         .        V.         .
16.733     6.3787      6.97  .   Q     .         .        V.         .
16.750     6.3882      6.86  .   Q     .         .         V         .
16.767     6.3975      6.75  .   Q     .         .         V         .
16.783     6.4067      6.68  .   Q     .         .         V         .
16.800     6.4158      6.60  .   Q     .         .         V         .
16.817     6.4247      6.53  .   Q     .         .         V         .
16.833     6.4336      6.46  .   Q     .         .         V         .
16.850     6.4424      6.39  .   Q     .         .         V         .
16.867     6.4511      6.32  .   Q     .         .         V         .
16.883     6.4598      6.25  .   Q     .         .         V         .
16.900     6.4683      6.17  .   Q     .         .         V         .
16.917     6.4767      6.10  .   Q     .         .         V         .
16.933     6.4850      6.05  .   Q     .         .         V         .
16.950     6.4932      5.99  .   Q     .         .         V         .
16.967     6.5014      5.94  .  Q      .         .         V         .
16.983     6.5095      5.89  .  Q      .         .         V         .
17.000     6.5176      5.83  .  Q      .         .         V         .
17.017     6.5255      5.78  .  Q      .         .         V         .
17.033     6.5334      5.72  .  Q      .         .         V         .
17.050     6.5412      5.67  .  Q      .         .         V         .
17.067     6.5490      5.62  .  Q      .         .         V         .
17.083     6.5567      5.62  .  Q      .         .         V         .
17.100     6.5645      5.65  .  Q      .         .         V         .
17.117     6.5723      5.67  .  Q      .         .         V         .
17.133     6.5801      5.69  .  Q      .         .         V         .
17.150     6.5880      5.72  .  Q      .         .         V         .
17.167     6.5959      5.74  .  Q      .         .         V         .
17.183     6.6039      5.76  .  Q      .         .         .V        .
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17.200	6.6118	5.79	.	Q	.	.	.V	.
17.217	6.6198	5.81	.	Q	.	.	.V	.
17.233	6.6278	5.79	.	Q	.	.	.V	.
17.250	6.6357	5.76	.	Q	.	.	.V	.
17.267	6.6436	5.72	.	Q	.	.	.V	.
17.283	6.6515	5.69	.	Q	.	.	.V	.
17.300	6.6593	5.66	.	Q	.	.	.V	.
17.317	6.6670	5.62	.	Q	.	.	.V	.
17.333	6.6747	5.59	.	Q	.	.	.V	.
17.350	6.6824	5.56	.	Q	.	.	.V	.
17.367	6.6900	5.52	.	Q	.	.	.V	.
17.383	6.6975	5.49	.	Q	.	.	.V	.
17.400	6.7050	5.46	.	Q	.	.	.V	.
17.417	6.7125	5.43	.	Q	.	.	.V	.
17.433	6.7200	5.41	.	Q	.	.	.V	.
17.450	6.7274	5.38	.	Q	.	.	.V	.
17.467	6.7348	5.35	.	Q	.	.	.V	.
17.483	6.7421	5.32	.	Q	.	.	.V	.
17.500	6.7494	5.29	.	Q	.	.	.V	.
17.517	6.7566	5.26	.	Q	.	.	.V	.
17.533	6.7638	5.24	.	Q	.	.	.V	.
17.550	6.7710	5.21	.	Q	.	.	.V	.
17.567	6.7782	5.19	.	Q	.	.	.V	.
17.583	6.7853	5.17	.	Q	.	.	.V	.
17.600	6.7924	5.14	.	Q	.	.	.V	.
17.617	6.7994	5.12	.	Q	.	.	.V	.
17.633	6.8064	5.09	.	Q	.	.	.V	.
17.650	6.8134	5.07	.	Q	.	.	. V	.
17.667	6.8204	5.04	.	Q	.	.	. V	.
17.683	6.8273	5.02	.	Q	.	.	. V	.
17.700	6.8342	5.00	.	Q	.	.	. V	.
17.717	6.8410	4.98	.	Q	.	.	. V	.
17.733	6.8479	4.96	.	Q	.	.	. V	.
17.750	6.8547	4.94	.	Q	.	.	. V	.
17.767	6.8614	4.92	.	Q	.	.	. V	.
17.783	6.8682	4.89	.	Q	.	.	. V	.
17.800	6.8749	4.87	.	Q	.	.	. V	.
17.817	6.8816	4.85	.	Q	.	.	. V	.
17.833	6.8882	4.83	.	Q	.	.	. V	.
17.850	6.8949	4.81	.	Q	.	.	. V	.
17.867	6.9015	4.80	.	Q	.	.	. V	.
17.883	6.9080	4.78	.	Q	.	.	. V	.
17.900	6.9146	4.76	.	Q	.	.	. V	.
17.917	6.9211	4.74	.	Q	.	.	. V	.
17.933	6.9276	4.72	.	Q	.	.	. V	.
17.950	6.9341	4.70	.	Q	.	.	. V	.
17.967	6.9406	4.68	.	Q	.	.	. V	.
17.983	6.9470	4.66	.	Q	.	.	. V	.
18.000	6.9534	4.64	.	Q	.	.	. V	.
18.017	6.9597	4.62	.	Q	.	.	. V	.
18.033	6.9661	4.59	.	Q	.	.	. V	.
18.050	6.9723	4.57	.	Q	.	.	. V	.
18.067	6.9786	4.54	.	Q	.	.	. V	.
18.083	6.9848	4.52	.	Q	.	.	. V	.
18.100	6.9910	4.49	.	Q	.	.	. V	.
18.117	6.9972	4.47	.	Q	.	.	. V	.
18.133	7.0033	4.45	.	Q	.	.	. V	.
18.150	7.0094	4.42	.	Q	.	.	. V	.
18.167	7.0154	4.40	.	Q	.	.	. V	.
18.183	7.0215	4.37	.	Q	.	.	. V	.
18.200	7.0274	4.35	.	Q	.	.	. V	.
18.217	7.0334	4.32	.	Q	.	.	. V	.
18.233	7.0393	4.30	.	Q	.	.	. V	.
18.250	7.0452	4.27	.	Q	.	.	. V	.
18.267	7.0510	4.25	.	Q	.	.	. V	.
18.283	7.0569	4.22	.	Q	.	.	. V	.
18.300	7.0627	4.21	.	Q	.	.	. V	.
18.317	7.0684	4.20	.	Q	.	.	. V	.
18.333	7.0742	4.18	.	Q	.	.	. V	.
18.350	7.0799	4.17	.	Q	.	.	. V	.
18.367	7.0857	4.15	.	Q	.	.	. V	.
18.383	7.0914	4.14	.	Q	.	.	. V	.
18.400	7.0971	4.13	.	Q	.	.	. V	.
18.417	7.1027	4.11	.	Q	.	.	. V	.
18.433	7.1084	4.10	.	Q	.	.	. V	.
18.450	7.1140	4.09	.	Q	.	.	. V	.
18.467	7.1196	4.08	.	Q	.	.	. V	.
18.483	7.1252	4.06	.	Q	.	.	. V	.
18.500	7.1308	4.05	.	Q	.	.	. V	.

18.517	7.1363	4.04	.	Q	.	.	.	V	.	
18.533	7.1419	4.03	.	Q	.	.	.	V	.	
18.550	7.1474	4.01	.	Q	.	.	.	V	.	
18.567	7.1529	4.00	.	Q	.	.	.	V	.	
18.583	7.1584	3.99	.	Q	.	.	.	V	.	
18.600	7.1639	3.98	.	Q	.	.	.	V	.	
18.617	7.1694	3.97	.	Q	.	.	.	V	.	
18.633	7.1748	3.95	.	Q	.	.	.	V	.	
18.650	7.1802	3.94	.	Q	.	.	.	V	.	
18.667	7.1857	3.93	.	Q	.	.	.	V	.	
18.683	7.1911	3.92	.	Q	.	.	.	V	.	
18.700	7.1964	3.91	.	Q	.	.	.	V	.	
18.717	7.2018	3.90	.	Q	.	.	.	V	.	
18.733	7.2072	3.89	.	Q	.	.	.	V	.	
18.750	7.2125	3.88	.	Q	.	.	.	V	.	
18.767	7.2178	3.87	.	Q	.	.	.	V	.	
18.783	7.2231	3.86	.	Q	.	.	.	V	.	
18.800	7.2284	3.84	.	Q	.	.	.	V	.	
18.817	7.2337	3.83	.	Q	.	.	.	V	.	
18.833	7.2390	3.82	.	Q	.	.	.	V	.	
18.850	7.2442	3.81	.	Q	.	.	.	V	.	
18.867	7.2495	3.80	.	Q	.	.	.	V	.	
18.883	7.2547	3.79	.	Q	.	.	.	V	.	
18.900	7.2599	3.78	.	Q	.	.	.	V	.	
18.917	7.2651	3.77	.	Q	.	.	.	V	.	
18.933	7.2703	3.76	.	Q	.	.	.	V	.	
18.950	7.2755	3.75	.	Q	.	.	.	V	.	
18.967	7.2806	3.74	.	Q	.	.	.	V	.	
18.983	7.2858	3.73	.	Q	.	.	.	V	.	
19.000	7.2909	3.73	.	Q	.	.	.	V	.	
19.017	7.2960	3.72	.	Q	.	.	.	V	.	
19.033	7.3011	3.71	.	Q	.	.	.	V	.	
19.050	7.3062	3.70	.	Q	.	.	.	V	.	
19.067	7.3113	3.69	.	Q	.	.	.	V	.	
19.083	7.3164	3.68	.	Q	.	.	.	V	.	
19.100	7.3214	3.67	.	Q	.	.	.	V	.	
19.117	7.3265	3.66	.	Q	.	.	.	V	.	
19.133	7.3315	3.65	.	Q	.	.	.	V	.	
19.150	7.3365	3.64	.	Q	.	.	.	V	.	
19.167	7.3415	3.63	.	Q	.	.	.	V	.	
19.183	7.3465	3.63	.	Q	.	.	.	V	.	
19.200	7.3515	3.62	.	Q	.	.	.	V	.	
19.217	7.3565	3.61	.	Q	.	.	.	V	.	
19.233	7.3614	3.60	.	Q	.	.	.	V	.	
19.250	7.3664	3.59	.	Q	.	.	.	V	.	
19.267	7.3713	3.58	.	Q	.	.	.	V	.	
19.283	7.3762	3.58	.	Q	.	.	.	V	.	
19.300	7.3811	3.57	.	Q	.	.	.	V	.	
19.317	7.3860	3.56	.	Q	.	.	.	V	.	
19.333	7.3909	3.55	.	Q	.	.	.	V	.	
19.350	7.3958	3.54	.	Q	.	.	.	V	.	
19.367	7.4007	3.53	.	Q	.	.	.	V	.	
19.383	7.4055	3.53	.	Q	.	.	.	V	.	
19.400	7.4104	3.52	.	Q	.	.	.	V	.	
19.417	7.4152	3.51	.	Q	.	.	.	V	.	
19.433	7.4200	3.50	.	Q	.	.	.	V	.	
19.450	7.4249	3.50	.	Q	.	.	.	V	.	
19.467	7.4297	3.49	.	Q	.	.	.	V	.	
19.483	7.4345	3.48	.	Q	.	.	.	V	.	
19.500	7.4392	3.47	.	Q	.	.	.	V	.	
19.517	7.4440	3.47	.	Q	.	.	.	V	.	
19.533	7.4488	3.46	.	Q	.	.	.	V	.	
19.550	7.4535	3.45	.	Q	.	.	.	V	.	
19.567	7.4583	3.44	.	Q	.	.	.	V	.	
19.583	7.4630	3.44	.	Q	.	.	.	V	.	
19.600	7.4677	3.43	.	Q	.	.	.	V	.	
19.617	7.4724	3.42	.	Q	.	.	.	V	.	
19.633	7.4771	3.41	.	Q	.	.	.	V	.	
19.650	7.4818	3.41	.	Q	.	.	.	V	.	
19.667	7.4865	3.40	.	Q	.	.	.	V	.	
19.683	7.4912	3.39	.	Q	.	.	.	V	.	
19.700	7.4959	3.39	.	Q	.	.	.	V	.	
19.717	7.5005	3.38	.	Q	.	.	.	V	.	
19.733	7.5052	3.37	.	Q	.	.	.	V	.	
19.750	7.5098	3.37	.	Q	.	.	.	V	.	
19.767	7.5144	3.36	.	Q	.	.	.	V	.	
19.783	7.5190	3.35	.	Q	.	.	.	V	.	
19.800	7.5237	3.35	.	Q	.	.	.	V	.	
19.817	7.5283	3.34	.	Q	.	.	.	V	.	

19.833	7.5328	3.33	. Q	.	.	.	V	.
19.850	7.5374	3.33	. Q	.	.	.	V	.
19.867	7.5420	3.32	. Q	.	.	.	V	.
19.883	7.5466	3.31	. Q	.	.	.	V	.
19.900	7.5511	3.31	. Q	.	.	.	V	.
19.917	7.5557	3.30	. Q	.	.	.	V	.
19.933	7.5602	3.29	. Q	.	.	.	V	.
19.950	7.5647	3.29	. Q	.	.	.	V	.
19.967	7.5693	3.28	. Q	.	.	.	V	.
19.983	7.5738	3.28	. Q	.	.	.	V	.
20.000	7.5783	3.27	. Q	.	.	.	V	.
20.017	7.5828	3.26	. Q	.	.	.	V	.
20.033	7.5873	3.26	. Q	.	.	.	V	.
20.050	7.5917	3.25	. Q	.	.	.	V	.
20.067	7.5962	3.25	. Q	.	.	.	V	.
20.083	7.6007	3.24	. Q	.	.	.	V	.
20.100	7.6051	3.23	. Q	.	.	.	V	.
20.117	7.6096	3.23	. Q	.	.	.	V	.
20.133	7.6140	3.22	. Q	.	.	.	V	.
20.150	7.6184	3.22	. Q	.	.	.	V	.
20.167	7.6228	3.21	. Q	.	.	.	V	.
20.183	7.6273	3.20	. Q	.	.	.	V	.
20.200	7.6317	3.20	. Q	.	.	.	V	.
20.217	7.6361	3.19	. Q	.	.	.	V	.
20.233	7.6405	3.19	. Q	.	.	.	V	.
20.250	7.6448	3.18	. Q	.	.	.	V	.
20.267	7.6492	3.18	. Q	.	.	.	V	.
20.283	7.6536	3.17	. Q	.	.	.	V	.
20.300	7.6579	3.16	. Q	.	.	.	V	.
20.317	7.6623	3.16	. Q	.	.	.	V	.
20.333	7.6666	3.15	. Q	.	.	.	V	.
20.350	7.6710	3.15	. Q	.	.	.	V	.
20.367	7.6753	3.14	. Q	.	.	.	V	.
20.383	7.6796	3.14	. Q	.	.	.	V	.
20.400	7.6839	3.13	. Q	.	.	.	V	.
20.417	7.6882	3.13	. Q	.	.	.	V	.
20.433	7.6925	3.12	. Q	.	.	.	V	.
20.450	7.6968	3.12	. Q	.	.	.	V	.
20.467	7.7011	3.11	. Q	.	.	.	V	.
20.483	7.7054	3.11	. Q	.	.	.	V	.
20.500	7.7097	3.10	. Q	.	.	.	V	.
20.517	7.7139	3.10	. Q	.	.	.	V	.
20.533	7.7182	3.09	. Q	.	.	.	V	.
20.550	7.7224	3.09	. Q	.	.	.	V	.
20.567	7.7267	3.08	. Q	.	.	.	V	.
20.583	7.7309	3.08	. Q	.	.	.	V	.
20.600	7.7351	3.07	. Q	.	.	.	V	.
20.617	7.7394	3.07	. Q	.	.	.	V	.
20.633	7.7436	3.06	. Q	.	.	.	V	.
20.650	7.7478	3.06	. Q	.	.	.	V	.
20.667	7.7520	3.05	. Q	.	.	.	V	.
20.683	7.7562	3.05	. Q	.	.	.	V	.
20.700	7.7604	3.04	. Q	.	.	.	V	.
20.717	7.7646	3.04	. Q	.	.	.	V	.
20.733	7.7687	3.03	. Q	.	.	.	V	.
20.750	7.7729	3.03	. Q	.	.	.	V	.
20.767	7.7771	3.02	. Q	.	.	.	V	.
20.783	7.7812	3.02	. Q	.	.	.	V	.
20.800	7.7854	3.01	. Q	.	.	.	V	.
20.817	7.7895	3.01	. Q	.	.	.	V	.
20.833	7.7936	3.00	. Q	.	.	.	V	.
20.850	7.7978	3.00	. Q	.	.	.	V	.
20.867	7.8019	2.99	. Q	.	.	.	V	.
20.883	7.8060	2.99	. Q	.	.	.	V	.
20.900	7.8101	2.98	. Q	.	.	.	V	.
20.917	7.8142	2.98	. Q	.	.	.	V	.
20.933	7.8183	2.98	. Q	.	.	.	V	.
20.950	7.8224	2.97	.Q	.	.	.	V	.
20.967	7.8265	2.97	.Q	.	.	.	V	.
20.983	7.8306	2.96	.Q	.	.	.	V	.
21.000	7.8347	2.96	.Q	.	.	.	V	.
21.017	7.8387	2.95	.Q	.	.	.	V	.
21.033	7.8428	2.95	.Q	.	.	.	V	.
21.050	7.8468	2.94	.Q	.	.	.	V	.
21.067	7.8509	2.94	.Q	.	.	.	V	.
21.083	7.8549	2.94	.Q	.	.	.	V	.
21.100	7.8590	2.93	.Q	.	.	.	V	.
21.117	7.8630	2.93	.Q	.	.	.	V	.
21.133	7.8670	2.92	.Q	.	.	.	V	.

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21.150      7.8711      2.92  .Q        .         .         .     V   .
21.167      7.8751      2.91  .Q        .         .         .      V  .
21.183      7.8791      2.91  .Q        .         .         .      V  .
21.200      7.8831      2.91  .Q        .         .         .      V  .
21.217      7.8871      2.90  .Q        .         .         .      V  .
21.233      7.8911      2.90  .Q        .         .         .      V  .
21.250      7.8951      2.89  .Q        .         .         .      V  .
21.267      7.8990      2.89  .Q        .         .         .      V  .
21.283      7.9030      2.89  .Q        .         .         .      V  .
21.300      7.9070      2.88  .Q        .         .         .      V  .
21.317      7.9109      2.88  .Q        .         .         .      V  .
21.333      7.9149      2.87  .Q        .         .         .      V  .
21.350      7.9188      2.87  .Q        .         .         .      V  .
21.367      7.9228      2.87  .Q        .         .         .      V  .
21.383      7.9267      2.86  .Q        .         .         .      V  .
21.400      7.9307      2.86  .Q        .         .         .      V  .
21.417      7.9346      2.85  .Q        .         .         .      V  .
21.433      7.9385      2.85  .Q        .         .         .      V  .
21.450      7.9424      2.85  .Q        .         .         .      V  .
21.467      7.9464      2.84  .Q        .         .         .      V  .
21.483      7.9503      2.84  .Q        .         .         .      V  .
21.500      7.9542      2.83  .Q        .         .         .      V  .
21.517      7.9581      2.83  .Q        .         .         .      V  .
21.533      7.9620      2.83  .Q        .         .         .      V  .
21.550      7.9659      2.82  .Q        .         .         .      V  .
21.567      7.9697      2.82  .Q        .         .         .      V  .
21.583      7.9736      2.82  .Q        .         .         .      V  .
21.600      7.9775      2.81  .Q        .         .         .      V  .
21.617      7.9814      2.81  .Q        .         .         .      V  .
21.633      7.9852      2.80  .Q        .         .         .      V  .
21.650      7.9891      2.80  .Q        .         .         .      V  .
21.667      7.9929      2.80  .Q        .         .         .      V  .
21.683      7.9968      2.79  .Q        .         .         .      V  .
21.700      8.0006      2.79  .Q        .         .         .      V  .
21.717      8.0045      2.79  .Q        .         .         .      V  .
21.733      8.0083      2.78  .Q        .         .         .      V  .
21.750      8.0121      2.78  .Q        .         .         .      V  .
21.767      8.0159      2.77  .Q        .         .         .      V  .
21.783      8.0198      2.77  .Q        .         .         .      V  .
21.800      8.0236      2.77  .Q        .         .         .      V  .
21.817      8.0274      2.76  .Q        .         .         .      V  .
21.833      8.0312      2.76  .Q        .         .         .      V  .
21.850      8.0350      2.76  .Q        .         .         .      V  .
21.867      8.0388      2.75  .Q        .         .         .      V  .
21.883      8.0426      2.75  .Q        .         .         .      V  .
21.900      8.0463      2.75  .Q        .         .         .      V  .
21.917      8.0501      2.74  .Q        .         .         .      V  .
21.933      8.0539      2.74  .Q        .         .         .      V  .
21.950      8.0577      2.74  .Q        .         .         .      V  .
21.967      8.0614      2.73  .Q        .         .         .      V  .
21.983      8.0652      2.73  .Q        .         .         .      V  .
22.000      8.0689      2.73  .Q        .         .         .      V  .
22.017      8.0727      2.72  .Q        .         .         .      V  .
22.033      8.0764      2.72  .Q        .         .         .      V  .
22.050      8.0802      2.72  .Q        .         .         .      V  .
22.067      8.0839      2.71  .Q        .         .         .      V  .
22.083      8.0876      2.71  .Q        .         .         .       V .
22.100      8.0914      2.71  .Q        .         .         .       V .
22.117      8.0951      2.70  .Q        .         .         .       V .
22.133      8.0988      2.70  .Q        .         .         .       V .
22.150      8.1025      2.70  .Q        .         .         .       V .
22.167      8.1062      2.69  .Q        .         .         .       V .
22.183      8.1099      2.69  .Q        .         .         .       V .
22.200      8.1136      2.69  .Q        .         .         .       V .
22.217      8.1173      2.68  .Q        .         .         .       V .
22.233      8.1210      2.68  .Q        .         .         .       V .
22.250      8.1247      2.68  .Q        .         .         .       V .
22.267      8.1284      2.67  .Q        .         .         .       V .
22.283      8.1321      2.67  .Q        .         .         .       V .
22.300      8.1357      2.67  .Q        .         .         .       V .
22.317      8.1394      2.66  .Q        .         .         .       V .
22.333      8.1431      2.66  .Q        .         .         .       V .
22.350      8.1467      2.66  .Q        .         .         .       V .
22.367      8.1504      2.66  .Q        .         .         .       V .
22.383      8.1541      2.65  .Q        .         .         .       V .
22.400      8.1577      2.65  .Q        .         .         .       V .
22.417      8.1614      2.65  .Q        .         .         .       V .
22.433      8.1650      2.64  .Q        .         .         .       V .
22.450      8.1686      2.64  .Q        .         .         .       V .
```

22.467	8.1723	2.64	.Q	.	.	.	V .
22.483	8.1759	2.63	.Q	.	.	.	V .
22.500	8.1795	2.63	.Q	.	.	.	V .
22.517	8.1831	2.63	.Q	.	.	.	V .
22.533	8.1867	2.62	.Q	.	.	.	V .
22.550	8.1904	2.62	.Q	.	.	.	V .
22.567	8.1940	2.62	.Q	.	.	.	V .
22.583	8.1976	2.62	.Q	.	.	.	V .
22.600	8.2012	2.61	.Q	.	.	.	V .
22.617	8.2048	2.61	.Q	.	.	.	V .
22.633	8.2084	2.61	.Q	.	.	.	V .
22.650	8.2119	2.60	.Q	.	.	.	V .
22.667	8.2155	2.60	.Q	.	.	.	V .
22.683	8.2191	2.60	.Q	.	.	.	V .
22.700	8.2227	2.60	.Q	.	.	.	V .
22.717	8.2262	2.59	.Q	.	.	.	V .
22.733	8.2298	2.59	.Q	.	.	.	V .
22.750	8.2334	2.59	.Q	.	.	.	V .
22.767	8.2369	2.58	.Q	.	.	.	V .
22.783	8.2405	2.58	.Q	.	.	.	V .
22.800	8.2440	2.58	.Q	.	.	.	V .
22.817	8.2476	2.58	.Q	.	.	.	V .
22.833	8.2511	2.57	.Q	.	.	.	V .
22.850	8.2547	2.57	.Q	.	.	.	V .
22.867	8.2582	2.57	.Q	.	.	.	V .
22.883	8.2617	2.56	.Q	.	.	.	V .
22.900	8.2653	2.56	.Q	.	.	.	V .
22.917	8.2688	2.56	.Q	.	.	.	V .
22.933	8.2723	2.56	.Q	.	.	.	V .
22.950	8.2758	2.55	.Q	.	.	.	V .
22.967	8.2794	2.55	.Q	.	.	.	V .
22.983	8.2829	2.55	.Q	.	.	.	V .
23.000	8.2864	2.55	.Q	.	.	.	V .
23.017	8.2899	2.54	.Q	.	.	.	V .
23.033	8.2934	2.54	.Q	.	.	.	V .
23.050	8.2969	2.54	.Q	.	.	.	V .
23.067	8.3004	2.53	.Q	.	.	.	V.
23.083	8.3038	2.53	.Q	.	.	.	V.
23.100	8.3073	2.53	.Q	.	.	.	V.
23.117	8.3108	2.53	.Q	.	.	.	V.
23.133	8.3143	2.52	.Q	.	.	.	V.
23.150	8.3178	2.52	.Q	.	.	.	V.
23.167	8.3212	2.52	.Q	.	.	.	V.
23.183	8.3247	2.52	.Q	.	.	.	V.
23.200	8.3282	2.51	.Q	.	.	.	V.
23.217	8.3316	2.51	.Q	.	.	.	V.
23.233	8.3351	2.51	.Q	.	.	.	V.
23.250	8.3385	2.51	.Q	.	.	.	V.
23.267	8.3420	2.50	.Q	.	.	.	V.
23.283	8.3454	2.50	.Q	.	.	.	V.
23.300	8.3489	2.50	.Q	.	.	.	V.
23.317	8.3523	2.50	.Q	.	.	.	V.
23.333	8.3557	2.49	.Q	.	.	.	V.
23.350	8.3592	2.49	.Q	.	.	.	V.
23.367	8.3626	2.49	.Q	.	.	.	V.
23.383	8.3660	2.49	.Q	.	.	.	V.
23.400	8.3694	2.48	.Q	.	.	.	V.
23.417	8.3729	2.48	.Q	.	.	.	V.
23.433	8.3763	2.48	.Q	.	.	.	V.
23.450	8.3797	2.48	.Q	.	.	.	V.
23.467	8.3831	2.47	.Q	.	.	.	V.
23.483	8.3865	2.47	.Q	.	.	.	V.
23.500	8.3899	2.47	.Q	.	.	.	V.
23.517	8.3933	2.47	.Q	.	.	.	V.
23.533	8.3967	2.46	.Q	.	.	.	V.
23.550	8.4001	2.46	.Q	.	.	.	V.
23.567	8.4035	2.46	.Q	.	.	.	V.
23.583	8.4068	2.46	.Q	.	.	.	V.
23.600	8.4102	2.45	.Q	.	.	.	V.
23.617	8.4136	2.45	.Q	.	.	.	V.
23.633	8.4170	2.45	.Q	.	.	.	V.
23.650	8.4203	2.45	.Q	.	.	.	V.
23.667	8.4237	2.44	.Q	.	.	.	V.
23.683	8.4271	2.44	.Q	.	.	.	V.
23.700	8.4304	2.44	.Q	.	.	.	V.
23.717	8.4338	2.44	.Q	.	.	.	V.
23.733	8.4371	2.44	.Q	.	.	.	V.
23.750	8.4405	2.43	.Q	.	.	.	V.
23.767	8.4438	2.43	.Q	.	.	.	V.

```
  23.783      8.4472      2.43  .Q        .         .         .        V.
  23.800      8.4505      2.43  .Q        .         .         .        V.
  23.817      8.4539      2.42  .Q        .         .         .        V.
  23.833      8.4572      2.42  .Q        .         .         .        V.
  23.850      8.4605      2.42  .Q        .         .         .        V.
  23.867      8.4639      2.42  .Q        .         .         .        V.
  23.883      8.4672      2.41  .Q        .         .         .        V.
  23.900      8.4705      2.41  .Q        .         .         .        V.
  23.917      8.4738      2.41  .Q        .         .         .        V.
  23.933      8.4772      2.41  .Q        .         .         .        V.
  23.950      8.4805      2.41  .Q        .         .         .        V.
  23.967      8.4838      2.40  .Q        .         .         .        V.
  23.983      8.4871      2.40  .Q        .         .         .        V.
  24.000      8.4904      2.40  .Q        .         .         .        V.
  24.017      8.4937      2.40  .Q        .         .         .        V.
  24.033      8.4970      2.39  .Q        .         .         .        V.
  24.050      8.5002      2.33  .Q        .         .         .        V.
  24.067      8.5031      2.08  .Q        .         .         .        V.
  24.083      8.5056      1.81  .Q        .         .         .        V.
  24.100      8.5077      1.55  .Q        .         .         .        V.
  24.117      8.5095      1.29  Q         .         .         .        V.
  24.133      8.5109      1.03  Q         .         .         .        V.
  24.150      8.5119      0.76  Q         .         .         .        V.
  24.167      8.5126      0.50  Q         .         .         .        V.
  24.183      8.5129      0.24  Q         .         .         .        V.
--------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated               Duration
        Peak Flow Rate                    (minutes)
    ======================               =========
              0%                          1451.0
             10%                           735.0
             20%                           150.0
             30%                            90.0
             40%                            75.0
             50%                            60.0
             60%                            50.0
             70%                            35.0
             80%                            25.0
             90%                            10.0


********************************************************************************
  FLOW PROCESS FROM NODE    166.00 TO NODE    166.00 IS CODE = 3.2
--------------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
================================================================================

                    INFLOW
                   (STREAM 1)
                        |
                        |
                        V                __effective depth
                    -----------          |   (and volume)
                   |           |    |    |
                   |           |    |....V........
                   | detention |<-->|           outflow
                   |   basin   |    |.........______
                    -----------     |    ^    |  \
                        |           |  dead   |   basin outlet
                        V           | storage |
                     OUTFLOW         ---------
                   (STREAM 1)



          ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
          THROUGH A FLOW-THROUGH DETENTION BASIN
          SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
            DEAD STORAGE(AF) =      0.000
            SPECIFIED DEAD STORAGE(AF) FILLED =      0.000
            SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET =      0.000
            DETENTION BASIN CONSTANT LOSS RATE(CFS) =    0.00


          BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:
```

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	0.10	34.16	0.004
3	0.20	34.49	0.023
4	0.30	34.82	0.069
5	0.40	35.15	0.157
6	0.50	35.47	0.304
7	0.60	35.80	0.494
8	0.70	36.11	0.742
9	0.80	36.43	1.026
10	0.90	36.74	1.332

==========

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(1-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.017	0.000	0.26	0.00	0.00	0.2	0.000
0.033	0.000	0.79	0.00	0.00	0.7	0.000
0.050	0.000	1.32	0.00	0.00	1.3	0.000
0.067	0.000	1.85	0.00	0.01	1.8	0.000
0.083	0.000	2.32	0.00	0.01	2.3	0.000
0.100	0.000	2.38	0.00	0.01	2.4	0.000
0.117	0.000	2.38	0.00	0.01	2.4	0.000
0.133	0.000	2.38	0.00	0.01	2.4	0.000
0.150	0.000	2.38	0.00	0.01	2.4	0.000
0.167	0.000	2.38	0.00	0.01	2.4	0.000
0.183	0.000	2.38	0.00	0.01	2.4	0.000
0.200	0.000	2.39	0.00	0.01	2.4	0.000
0.217	0.000	2.39	0.00	0.01	2.4	0.000
0.233	0.000	2.39	0.00	0.01	2.4	0.000
0.250	0.000	2.39	0.00	0.01	2.4	0.000
0.267	0.000	2.39	0.00	0.01	2.4	0.000
0.283	0.000	2.39	0.00	0.01	2.4	0.000
0.300	0.000	2.39	0.00	0.01	2.4	0.000
0.317	0.000	2.39	0.00	0.01	2.4	0.000
0.333	0.000	2.39	0.00	0.01	2.4	0.000
0.350	0.000	2.40	0.00	0.01	2.4	0.000
0.367	0.000	2.40	0.00	0.01	2.4	0.000
0.383	0.000	2.40	0.00	0.01	2.4	0.000
0.400	0.000	2.40	0.00	0.01	2.4	0.000
0.417	0.000	2.40	0.00	0.01	2.4	0.000
0.433	0.000	2.40	0.00	0.01	2.4	0.000
0.450	0.000	2.40	0.00	0.01	2.4	0.000
0.467	0.000	2.40	0.00	0.01	2.4	0.000
0.483	0.000	2.40	0.00	0.01	2.4	0.000
0.500	0.000	2.40	0.00	0.01	2.4	0.000
0.517	0.000	2.41	0.00	0.01	2.4	0.000
0.533	0.000	2.41	0.00	0.01	2.4	0.000
0.550	0.000	2.41	0.00	0.01	2.4	0.000
0.567	0.000	2.41	0.00	0.01	2.4	0.000
0.583	0.000	2.41	0.00	0.01	2.4	0.000
0.600	0.000	2.41	0.00	0.01	2.4	0.000
0.617	0.000	2.41	0.00	0.01	2.4	0.000
0.633	0.000	2.41	0.00	0.01	2.4	0.000
0.650	0.000	2.42	0.00	0.01	2.4	0.000
0.667	0.000	2.42	0.00	0.01	2.4	0.000
0.683	0.000	2.42	0.00	0.01	2.4	0.000
0.700	0.000	2.42	0.00	0.01	2.4	0.000
0.717	0.000	2.42	0.00	0.01	2.4	0.000
0.733	0.000	2.42	0.00	0.01	2.4	0.000
0.750	0.000	2.42	0.00	0.01	2.4	0.000
0.767	0.000	2.42	0.00	0.01	2.4	0.000
0.783	0.000	2.42	0.00	0.01	2.4	0.000
0.800	0.000	2.43	0.00	0.01	2.4	0.000
0.817	0.000	2.43	0.00	0.01	2.4	0.000
0.833	0.000	2.43	0.00	0.01	2.4	0.000
0.850	0.000	2.43	0.00	0.01	2.4	0.000
0.867	0.000	2.43	0.00	0.01	2.4	0.000
0.883	0.000	2.43	0.00	0.01	2.4	0.000
0.900	0.000	2.43	0.00	0.01	2.4	0.000
0.917	0.000	2.43	0.00	0.01	2.4	0.000

0.933	0.000	2.44	0.00	0.01	2.4	0.000
0.950	0.000	2.44	0.00	0.01	2.4	0.000
0.967	0.000	2.44	0.00	0.01	2.4	0.000
0.983	0.000	2.44	0.00	0.01	2.4	0.000
1.000	0.000	2.44	0.00	0.01	2.4	0.000
1.017	0.000	2.44	0.00	0.01	2.4	0.000
1.033	0.000	2.44	0.00	0.01	2.4	0.000
1.050	0.000	2.44	0.00	0.01	2.4	0.000
1.067	0.000	2.44	0.00	0.01	2.4	0.000
1.083	0.000	2.45	0.00	0.01	2.4	0.000
1.100	0.000	2.45	0.00	0.01	2.4	0.000
1.117	0.000	2.45	0.00	0.01	2.4	0.000
1.133	0.000	2.45	0.00	0.01	2.4	0.000
1.150	0.000	2.45	0.00	0.01	2.4	0.000
1.167	0.000	2.45	0.00	0.01	2.5	0.000
1.183	0.000	2.45	0.00	0.01	2.5	0.000
1.200	0.000	2.45	0.00	0.01	2.5	0.000
1.217	0.000	2.45	0.00	0.01	2.5	0.000
1.233	0.000	2.46	0.00	0.01	2.5	0.000
1.250	0.000	2.46	0.00	0.01	2.5	0.000
1.267	0.000	2.46	0.00	0.01	2.5	0.000
1.283	0.000	2.46	0.00	0.01	2.5	0.000
1.300	0.000	2.46	0.00	0.01	2.5	0.000
1.317	0.000	2.46	0.00	0.01	2.5	0.000
1.333	0.000	2.46	0.00	0.01	2.5	0.000
1.350	0.000	2.47	0.00	0.01	2.5	0.000
1.367	0.000	2.47	0.00	0.01	2.5	0.000
1.383	0.000	2.47	0.00	0.01	2.5	0.000
1.400	0.000	2.47	0.00	0.01	2.5	0.000
1.417	0.000	2.47	0.00	0.01	2.5	0.000
1.433	0.000	2.47	0.00	0.01	2.5	0.000
1.450	0.000	2.47	0.00	0.01	2.5	0.000
1.467	0.000	2.47	0.00	0.01	2.5	0.000
1.483	0.000	2.47	0.00	0.01	2.5	0.000
1.500	0.000	2.48	0.00	0.01	2.5	0.000
1.517	0.000	2.48	0.00	0.01	2.5	0.000
1.533	0.000	2.48	0.00	0.01	2.5	0.000
1.550	0.000	2.48	0.00	0.01	2.5	0.000
1.567	0.000	2.48	0.00	0.01	2.5	0.000
1.583	0.000	2.48	0.00	0.01	2.5	0.000
1.600	0.000	2.48	0.00	0.01	2.5	0.000
1.617	0.000	2.49	0.00	0.01	2.5	0.000
1.633	0.000	2.49	0.00	0.01	2.5	0.000
1.650	0.000	2.49	0.00	0.01	2.5	0.000
1.667	0.000	2.49	0.00	0.01	2.5	0.000
1.683	0.000	2.49	0.00	0.01	2.5	0.000
1.700	0.000	2.49	0.00	0.01	2.5	0.000
1.717	0.000	2.49	0.00	0.01	2.5	0.000
1.733	0.000	2.49	0.00	0.01	2.5	0.000
1.750	0.000	2.49	0.00	0.01	2.5	0.000
1.767	0.000	2.49	0.00	0.01	2.5	0.000
1.783	0.000	2.50	0.00	0.01	2.5	0.000
1.800	0.000	2.50	0.00	0.01	2.5	0.000
1.817	0.000	2.50	0.00	0.01	2.5	0.000
1.833	0.000	2.50	0.00	0.01	2.5	0.000
1.850	0.000	2.50	0.00	0.01	2.5	0.000
1.867	0.000	2.50	0.00	0.01	2.5	0.000
1.883	0.000	2.51	0.00	0.01	2.5	0.000
1.900	0.000	2.51	0.00	0.01	2.5	0.000
1.917	0.000	2.51	0.00	0.01	2.5	0.000
1.933	0.000	2.51	0.00	0.01	2.5	0.000
1.950	0.000	2.51	0.00	0.01	2.5	0.000
1.967	0.000	2.51	0.00	0.01	2.5	0.000
1.983	0.000	2.51	0.00	0.01	2.5	0.000
2.000	0.000	2.51	0.00	0.01	2.5	0.000
2.017	0.000	2.51	0.00	0.01	2.5	0.000
2.033	0.000	2.51	0.00	0.01	2.5	0.000
2.050	0.000	2.52	0.00	0.01	2.5	0.000
2.067	0.000	2.52	0.00	0.01	2.5	0.000
2.083	0.000	2.52	0.00	0.01	2.5	0.000
2.100	0.000	2.52	0.00	0.01	2.5	0.000
2.117	0.000	2.52	0.00	0.01	2.5	0.000
2.133	0.000	2.52	0.00	0.01	2.5	0.000
2.150	0.000	2.53	0.00	0.01	2.5	0.000
2.167	0.000	2.53	0.00	0.01	2.5	0.000
2.183	0.000	2.53	0.00	0.01	2.5	0.000
2.200	0.000	2.53	0.00	0.01	2.5	0.000
2.217	0.000	2.53	0.00	0.01	2.5	0.000
2.233	0.000	2.53	0.00	0.01	2.5	0.000

2.250	0.000	2.53	0.00	0.01	2.5	0.000
2.267	0.000	2.53	0.00	0.01	2.5	0.000
2.283	0.000	2.54	0.00	0.01	2.5	0.000
2.300	0.000	2.54	0.00	0.01	2.5	0.000
2.317	0.000	2.54	0.00	0.01	2.5	0.000
2.333	0.000	2.54	0.00	0.01	2.5	0.000
2.350	0.000	2.54	0.00	0.01	2.5	0.000
2.367	0.000	2.54	0.00	0.01	2.5	0.000
2.383	0.000	2.54	0.00	0.01	2.5	0.000
2.400	0.000	2.54	0.00	0.01	2.5	0.000
2.417	0.000	2.55	0.00	0.01	2.5	0.000
2.433	0.000	2.55	0.00	0.01	2.5	0.000
2.450	0.000	2.55	0.00	0.01	2.5	0.000
2.467	0.000	2.55	0.00	0.01	2.6	0.000
2.483	0.000	2.55	0.00	0.01	2.6	0.000
2.500	0.000	2.56	0.00	0.01	2.6	0.000
2.517	0.000	2.56	0.00	0.01	2.6	0.000
2.533	0.000	2.56	0.00	0.01	2.6	0.000
2.550	0.000	2.56	0.00	0.01	2.6	0.000
2.567	0.000	2.56	0.00	0.01	2.6	0.000
2.583	0.000	2.56	0.00	0.01	2.6	0.000
2.600	0.000	2.56	0.00	0.01	2.6	0.000
2.617	0.000	2.56	0.00	0.01	2.6	0.000
2.633	0.000	2.56	0.00	0.01	2.6	0.000
2.650	0.000	2.56	0.00	0.01	2.6	0.000
2.667	0.000	2.56	0.00	0.01	2.6	0.000
2.683	0.000	2.57	0.00	0.01	2.6	0.000
2.700	0.000	2.57	0.00	0.01	2.6	0.000
2.717	0.000	2.57	0.00	0.01	2.6	0.000
2.733	0.000	2.57	0.00	0.01	2.6	0.000
2.750	0.000	2.57	0.00	0.01	2.6	0.000
2.767	0.000	2.58	0.00	0.01	2.6	0.000
2.783	0.000	2.58	0.00	0.01	2.6	0.000
2.800	0.000	2.58	0.00	0.01	2.6	0.000
2.817	0.000	2.58	0.00	0.01	2.6	0.000
2.833	0.000	2.58	0.00	0.01	2.6	0.000
2.850	0.000	2.58	0.00	0.01	2.6	0.000
2.867	0.000	2.58	0.00	0.01	2.6	0.000
2.883	0.000	2.59	0.00	0.01	2.6	0.000
2.900	0.000	2.59	0.00	0.01	2.6	0.000
2.917	0.000	2.59	0.00	0.01	2.6	0.000
2.933	0.000	2.59	0.00	0.01	2.6	0.000
2.950	0.000	2.59	0.00	0.01	2.6	0.000
2.967	0.000	2.59	0.00	0.01	2.6	0.000
2.983	0.000	2.59	0.00	0.01	2.6	0.000
3.000	0.000	2.59	0.00	0.01	2.6	0.000
3.017	0.000	2.60	0.00	0.01	2.6	0.000
3.033	0.000	2.60	0.00	0.01	2.6	0.000
3.050	0.000	2.60	0.00	0.01	2.6	0.000
3.067	0.000	2.60	0.00	0.01	2.6	0.000
3.083	0.000	2.60	0.00	0.01	2.6	0.000
3.100	0.000	2.61	0.00	0.01	2.6	0.000
3.117	0.000	2.61	0.00	0.01	2.6	0.000
3.133	0.000	2.61	0.00	0.01	2.6	0.000
3.150	0.000	2.61	0.00	0.01	2.6	0.000
3.167	0.000	2.61	0.00	0.01	2.6	0.000
3.183	0.000	2.61	0.00	0.01	2.6	0.000
3.200	0.000	2.61	0.00	0.01	2.6	0.000
3.217	0.000	2.61	0.00	0.01	2.6	0.000
3.233	0.000	2.61	0.00	0.01	2.6	0.000
3.250	0.000	2.62	0.00	0.01	2.6	0.000
3.267	0.000	2.62	0.00	0.01	2.6	0.000
3.283	0.000	2.62	0.00	0.01	2.6	0.000
3.300	0.000	2.62	0.00	0.01	2.6	0.000
3.317	0.000	2.62	0.00	0.01	2.6	0.000
3.333	0.000	2.62	0.00	0.01	2.6	0.000
3.350	0.000	2.63	0.00	0.01	2.6	0.000
3.367	0.000	2.63	0.00	0.01	2.6	0.000
3.383	0.000	2.63	0.00	0.01	2.6	0.000
3.400	0.000	2.63	0.00	0.01	2.6	0.000
3.417	0.000	2.63	0.00	0.01	2.6	0.000
3.433	0.000	2.64	0.00	0.01	2.6	0.000
3.450	0.000	2.64	0.00	0.01	2.6	0.000
3.467	0.000	2.64	0.00	0.01	2.6	0.000
3.483	0.000	2.64	0.00	0.01	2.6	0.000
3.500	0.000	2.64	0.00	0.01	2.6	0.000
3.517	0.000	2.64	0.00	0.01	2.6	0.000
3.533	0.000	2.64	0.00	0.01	2.6	0.000
3.550	0.000	2.64	0.00	0.01	2.6	0.000

3.567	0.000	2.64	0.00	0.01	2.6	0.000
3.583	0.000	2.64	0.00	0.01	2.6	0.000
3.600	0.000	2.65	0.00	0.01	2.6	0.000
3.617	0.000	2.65	0.00	0.01	2.6	0.000
3.633	0.000	2.65	0.00	0.01	2.7	0.000
3.650	0.000	2.65	0.00	0.01	2.7	0.000
3.667	0.000	2.66	0.00	0.01	2.7	0.000
3.683	0.000	2.66	0.00	0.01	2.7	0.000
3.700	0.000	2.66	0.00	0.01	2.7	0.000
3.717	0.000	2.66	0.00	0.01	2.7	0.000
3.733	0.000	2.66	0.00	0.01	2.7	0.000
3.750	0.000	2.66	0.00	0.01	2.7	0.000
3.767	0.000	2.66	0.00	0.01	2.7	0.000
3.783	0.000	2.67	0.00	0.01	2.7	0.000
3.800	0.000	2.67	0.00	0.01	2.7	0.000
3.817	0.000	2.67	0.00	0.01	2.7	0.000
3.833	0.000	2.67	0.00	0.01	2.7	0.000
3.850	0.000	2.67	0.00	0.01	2.7	0.000
3.867	0.000	2.67	0.00	0.01	2.7	0.000
3.883	0.000	2.67	0.00	0.01	2.7	0.000
3.900	0.000	2.68	0.00	0.01	2.7	0.000
3.917	0.000	2.68	0.00	0.01	2.7	0.000
3.933	0.000	2.68	0.00	0.01	2.7	0.000
3.950	0.000	2.68	0.00	0.01	2.7	0.000
3.967	0.000	2.68	0.00	0.01	2.7	0.000
3.983	0.000	2.69	0.00	0.01	2.7	0.000
4.000	0.000	2.69	0.00	0.01	2.7	0.000
4.017	0.000	2.69	0.00	0.01	2.7	0.000
4.033	0.000	2.69	0.00	0.01	2.7	0.000
4.050	0.000	2.69	0.00	0.01	2.7	0.000
4.067	0.000	2.69	0.00	0.01	2.7	0.000
4.083	0.000	2.69	0.00	0.01	2.7	0.000
4.100	0.000	2.70	0.00	0.01	2.7	0.000
4.117	0.000	2.70	0.00	0.01	2.7	0.000
4.133	0.000	2.70	0.00	0.01	2.7	0.000
4.150	0.000	2.70	0.00	0.01	2.7	0.000
4.167	0.000	2.70	0.00	0.01	2.7	0.000
4.183	0.000	2.70	0.00	0.01	2.7	0.000
4.200	0.000	2.70	0.00	0.01	2.7	0.000
4.217	0.000	2.71	0.00	0.01	2.7	0.000
4.233	0.000	2.71	0.00	0.01	2.7	0.000
4.250	0.000	2.71	0.00	0.01	2.7	0.000
4.267	0.000	2.71	0.00	0.01	2.7	0.000
4.283	0.000	2.71	0.00	0.01	2.7	0.000
4.300	0.000	2.72	0.00	0.01	2.7	0.000
4.317	0.000	2.72	0.00	0.01	2.7	0.000
4.333	0.000	2.72	0.00	0.01	2.7	0.000
4.350	0.000	2.72	0.00	0.01	2.7	0.000
4.367	0.000	2.72	0.00	0.01	2.7	0.000
4.383	0.000	2.72	0.00	0.01	2.7	0.000
4.400	0.000	2.73	0.00	0.01	2.7	0.000
4.417	0.000	2.73	0.00	0.01	2.7	0.000
4.433	0.000	2.73	0.00	0.01	2.7	0.000
4.450	0.000	2.73	0.00	0.01	2.7	0.000
4.467	0.000	2.73	0.00	0.01	2.7	0.000
4.483	0.000	2.73	0.00	0.01	2.7	0.000
4.500	0.000	2.73	0.00	0.01	2.7	0.000
4.517	0.000	2.74	0.00	0.01	2.7	0.000
4.533	0.000	2.74	0.00	0.01	2.7	0.000
4.550	0.000	2.74	0.00	0.01	2.7	0.000
4.567	0.000	2.74	0.00	0.01	2.7	0.000
4.583	0.000	2.75	0.00	0.01	2.7	0.000
4.600	0.000	2.75	0.00	0.01	2.7	0.000
4.617	0.000	2.75	0.00	0.01	2.7	0.000
4.633	0.000	2.75	0.00	0.01	2.8	0.000
4.650	0.000	2.75	0.00	0.01	2.8	0.000
4.667	0.000	2.75	0.00	0.01	2.8	0.000
4.683	0.000	2.76	0.00	0.01	2.8	0.000
4.700	0.000	2.76	0.00	0.01	2.8	0.000
4.717	0.000	2.76	0.00	0.01	2.8	0.000
4.733	0.000	2.76	0.00	0.01	2.8	0.000
4.750	0.000	2.76	0.00	0.01	2.8	0.000
4.767	0.000	2.76	0.00	0.01	2.8	0.000
4.783	0.000	2.76	0.00	0.01	2.8	0.000
4.800	0.000	2.77	0.00	0.01	2.8	0.000
4.817	0.000	2.77	0.00	0.01	2.8	0.000
4.833	0.000	2.77	0.00	0.01	2.8	0.000
4.850	0.000	2.77	0.00	0.01	2.8	0.000
4.867	0.000	2.77	0.00	0.01	2.8	0.000

4.883	0.000	2.78	0.00	0.01	2.8	0.000
4.900	0.000	2.78	0.00	0.01	2.8	0.000
4.917	0.000	2.78	0.00	0.01	2.8	0.000
4.933	0.000	2.78	0.00	0.01	2.8	0.000
4.950	0.000	2.79	0.00	0.01	2.8	0.000
4.967	0.000	2.79	0.00	0.01	2.8	0.000
4.983	0.000	2.79	0.00	0.01	2.8	0.000
5.000	0.000	2.79	0.00	0.01	2.8	0.000
5.017	0.000	2.79	0.00	0.01	2.8	0.000
5.033	0.000	2.79	0.00	0.01	2.8	0.000
5.050	0.000	2.79	0.00	0.01	2.8	0.000
5.067	0.000	2.79	0.00	0.01	2.8	0.000
5.083	0.000	2.80	0.00	0.01	2.8	0.000
5.100	0.000	2.80	0.00	0.01	2.8	0.000
5.117	0.000	2.80	0.00	0.01	2.8	0.000
5.133	0.000	2.80	0.00	0.01	2.8	0.000
5.150	0.000	2.80	0.00	0.01	2.8	0.000
5.167	0.000	2.81	0.00	0.01	2.8	0.000
5.183	0.000	2.81	0.00	0.01	2.8	0.000
5.200	0.000	2.81	0.00	0.01	2.8	0.000
5.217	0.000	2.81	0.00	0.01	2.8	0.000
5.233	0.000	2.82	0.00	0.01	2.8	0.000
5.250	0.000	2.82	0.00	0.01	2.8	0.000
5.267	0.000	2.82	0.00	0.01	2.8	0.000
5.283	0.000	2.82	0.00	0.01	2.8	0.000
5.300	0.000	2.82	0.00	0.01	2.8	0.000
5.317	0.000	2.82	0.00	0.01	2.8	0.000
5.333	0.000	2.83	0.00	0.01	2.8	0.000
5.350	0.000	2.83	0.00	0.01	2.8	0.000
5.367	0.000	2.83	0.00	0.01	2.8	0.000
5.383	0.000	2.83	0.00	0.01	2.8	0.000
5.400	0.000	2.83	0.00	0.01	2.8	0.000
5.417	0.000	2.83	0.00	0.01	2.8	0.000
5.433	0.000	2.84	0.00	0.01	2.8	0.000
5.450	0.000	2.84	0.00	0.01	2.8	0.000
5.467	0.000	2.84	0.00	0.01	2.8	0.000
5.483	0.000	2.84	0.00	0.01	2.8	0.000
5.500	0.000	2.85	0.00	0.01	2.8	0.000
5.517	0.000	2.85	0.00	0.01	2.8	0.000
5.533	0.000	2.85	0.00	0.01	2.9	0.000
5.550	0.000	2.85	0.00	0.01	2.9	0.000
5.567	0.000	2.85	0.00	0.01	2.9	0.000
5.583	0.000	2.86	0.00	0.01	2.9	0.000
5.600	0.000	2.86	0.00	0.01	2.9	0.000
5.617	0.000	2.86	0.00	0.01	2.9	0.000
5.633	0.000	2.86	0.00	0.01	2.9	0.000
5.650	0.000	2.86	0.00	0.01	2.9	0.000
5.667	0.000	2.86	0.00	0.01	2.9	0.000
5.683	0.000	2.86	0.00	0.01	2.9	0.000
5.700	0.000	2.87	0.00	0.01	2.9	0.000
5.717	0.000	2.87	0.00	0.01	2.9	0.000
5.733	0.000	2.87	0.00	0.01	2.9	0.000
5.750	0.000	2.87	0.00	0.01	2.9	0.000
5.767	0.000	2.88	0.00	0.01	2.9	0.000
5.783	0.000	2.88	0.00	0.01	2.9	0.000
5.800	0.000	2.88	0.00	0.01	2.9	0.000
5.817	0.000	2.88	0.00	0.01	2.9	0.000
5.833	0.000	2.89	0.00	0.01	2.9	0.000
5.850	0.000	2.89	0.00	0.01	2.9	0.000
5.867	0.000	2.89	0.00	0.01	2.9	0.000
5.883	0.000	2.89	0.00	0.01	2.9	0.000
5.900	0.000	2.89	0.00	0.01	2.9	0.000
5.917	0.000	2.90	0.00	0.01	2.9	0.000
5.933	0.000	2.90	0.00	0.01	2.9	0.000
5.950	0.000	2.90	0.00	0.01	2.9	0.000
5.967	0.000	2.90	0.00	0.01	2.9	0.000
5.983	0.000	2.90	0.00	0.01	2.9	0.000
6.000	0.000	2.90	0.00	0.01	2.9	0.000
6.017	0.000	2.91	0.00	0.01	2.9	0.000
6.033	0.000	2.91	0.00	0.01	2.9	0.000
6.050	0.000	2.91	0.00	0.01	2.9	0.000
6.067	0.000	2.91	0.00	0.01	2.9	0.000
6.083	0.000	2.92	0.00	0.01	2.9	0.000
6.100	0.000	2.92	0.00	0.01	2.9	0.000
6.117	0.000	2.92	0.00	0.01	2.9	0.000
6.133	0.000	2.92	0.00	0.01	2.9	0.000
6.150	0.000	2.93	0.00	0.01	2.9	0.000
6.167	0.000	2.93	0.00	0.01	2.9	0.000
6.183	0.000	2.93	0.00	0.01	2.9	0.000

6.200	0.000	2.93	0.00	0.01	2.9	0.000
6.217	0.000	2.93	0.00	0.01	2.9	0.000
6.233	0.000	2.93	0.00	0.01	2.9	0.000
6.250	0.000	2.94	0.00	0.01	2.9	0.000
6.267	0.000	2.94	0.00	0.01	2.9	0.000
6.283	0.000	2.94	0.00	0.01	2.9	0.000
6.300	0.000	2.94	0.00	0.01	2.9	0.000
6.317	0.000	2.94	0.00	0.01	2.9	0.000
6.333	0.000	2.95	0.00	0.01	2.9	0.000
6.350	0.000	2.95	0.00	0.01	2.9	0.000
6.367	0.000	2.95	0.00	0.01	3.0	0.000
6.383	0.000	2.95	0.00	0.01	3.0	0.000
6.400	0.000	2.96	0.00	0.01	3.0	0.000
6.417	0.000	2.96	0.00	0.01	3.0	0.000
6.433	0.000	2.96	0.00	0.01	3.0	0.000
6.450	0.000	2.97	0.00	0.01	3.0	0.000
6.467	0.000	2.97	0.00	0.01	3.0	0.000
6.483	0.000	2.97	0.00	0.01	3.0	0.000
6.500	0.000	2.97	0.00	0.01	3.0	0.000
6.517	0.000	2.97	0.00	0.01	3.0	0.000
6.533	0.000	2.97	0.00	0.01	3.0	0.000
6.550	0.000	2.98	0.00	0.01	3.0	0.000
6.567	0.000	2.98	0.00	0.01	3.0	0.000
6.583	0.000	2.98	0.00	0.01	3.0	0.000
6.600	0.000	2.98	0.00	0.01	3.0	0.000
6.617	0.000	2.98	0.00	0.01	3.0	0.000
6.633	0.000	2.99	0.00	0.01	3.0	0.000
6.650	0.000	2.99	0.00	0.01	3.0	0.000
6.667	0.000	2.99	0.00	0.01	3.0	0.000
6.683	0.000	3.00	0.00	0.01	3.0	0.000
6.700	0.000	3.00	0.00	0.01	3.0	0.000
6.717	0.000	3.00	0.00	0.01	3.0	0.000
6.733	0.000	3.00	0.00	0.01	3.0	0.000
6.750	0.000	3.01	0.00	0.01	3.0	0.000
6.767	0.000	3.01	0.00	0.01	3.0	0.000
6.783	0.000	3.01	0.00	0.01	3.0	0.000
6.800	0.000	3.01	0.00	0.01	3.0	0.000
6.817	0.000	3.01	0.00	0.01	3.0	0.000
6.833	0.000	3.02	0.00	0.01	3.0	0.000
6.850	0.000	3.02	0.00	0.01	3.0	0.000
6.867	0.000	3.02	0.00	0.01	3.0	0.000
6.883	0.000	3.02	0.00	0.01	3.0	0.000
6.900	0.000	3.02	0.00	0.01	3.0	0.000
6.917	0.000	3.02	0.00	0.01	3.0	0.000
6.933	0.000	3.03	0.00	0.01	3.0	0.000
6.950	0.000	3.03	0.00	0.01	3.0	0.000
6.967	0.000	3.03	0.00	0.01	3.0	0.000
6.983	0.000	3.04	0.00	0.01	3.0	0.000
7.000	0.000	3.04	0.00	0.01	3.0	0.000
7.017	0.000	3.04	0.00	0.01	3.0	0.000
7.033	0.000	3.05	0.00	0.01	3.0	0.000
7.050	0.000	3.05	0.00	0.01	3.1	0.000
7.067	0.000	3.05	0.00	0.01	3.1	0.000
7.083	0.000	3.05	0.00	0.01	3.1	0.000
7.100	0.000	3.06	0.00	0.01	3.1	0.000
7.117	0.000	3.06	0.00	0.01	3.1	0.000
7.133	0.000	3.06	0.00	0.01	3.1	0.000
7.150	0.000	3.06	0.00	0.01	3.1	0.000
7.167	0.000	3.06	0.00	0.01	3.1	0.000
7.183	0.000	3.06	0.00	0.01	3.1	0.000
7.200	0.000	3.07	0.00	0.01	3.1	0.000
7.217	0.000	3.07	0.00	0.01	3.1	0.000
7.233	0.000	3.07	0.00	0.01	3.1	0.000
7.250	0.000	3.08	0.00	0.01	3.1	0.000
7.267	0.000	3.08	0.00	0.01	3.1	0.000
7.283	0.000	3.08	0.00	0.01	3.1	0.000
7.300	0.000	3.09	0.00	0.01	3.1	0.000
7.317	0.000	3.09	0.00	0.01	3.1	0.000
7.333	0.000	3.09	0.00	0.01	3.1	0.000
7.350	0.000	3.10	0.00	0.01	3.1	0.000
7.367	0.000	3.10	0.00	0.01	3.1	0.000
7.383	0.000	3.10	0.00	0.01	3.1	0.000
7.400	0.000	3.10	0.00	0.01	3.1	0.000
7.417	0.000	3.10	0.00	0.01	3.1	0.000
7.433	0.000	3.11	0.00	0.01	3.1	0.000
7.450	0.000	3.11	0.00	0.01	3.1	0.000
7.467	0.000	3.11	0.00	0.01	3.1	0.000
7.483	0.000	3.11	0.00	0.01	3.1	0.000
7.500	0.000	3.11	0.00	0.01	3.1	0.000

7.517	0.000	3.11	0.00	0.01	3.1	0.000
7.533	0.000	3.12	0.00	0.01	3.1	0.000
7.550	0.000	3.12	0.00	0.01	3.1	0.000
7.567	0.000	3.12	0.00	0.01	3.1	0.000
7.583	0.000	3.13	0.00	0.01	3.1	0.000
7.600	0.000	3.13	0.00	0.01	3.1	0.000
7.617	0.000	3.14	0.00	0.01	3.1	0.000
7.633	0.000	3.14	0.00	0.01	3.1	0.000
7.650	0.000	3.14	0.00	0.01	3.1	0.000
7.667	0.000	3.15	0.00	0.01	3.1	0.000
7.683	0.000	3.15	0.00	0.01	3.1	0.000
7.700	0.000	3.15	0.00	0.01	3.1	0.000
7.717	0.000	3.15	0.00	0.01	3.2	0.000
7.733	0.000	3.15	0.00	0.01	3.2	0.000
7.750	0.000	3.16	0.00	0.01	3.2	0.000
7.767	0.000	3.16	0.00	0.01	3.2	0.000
7.783	0.000	3.16	0.00	0.01	3.2	0.000
7.800	0.000	3.16	0.00	0.01	3.2	0.000
7.817	0.000	3.16	0.00	0.01	3.2	0.000
7.833	0.000	3.17	0.00	0.01	3.2	0.000
7.850	0.000	3.17	0.00	0.01	3.2	0.000
7.867	0.000	3.17	0.00	0.01	3.2	0.000
7.883	0.000	3.18	0.00	0.01	3.2	0.000
7.900	0.000	3.18	0.00	0.01	3.2	0.000
7.917	0.000	3.18	0.00	0.01	3.2	0.000
7.933	0.000	3.19	0.00	0.01	3.2	0.000
7.950	0.000	3.19	0.00	0.01	3.2	0.000
7.967	0.000	3.20	0.00	0.01	3.2	0.000
7.983	0.000	3.20	0.00	0.01	3.2	0.000
8.000	0.000	3.20	0.00	0.01	3.2	0.000
8.017	0.000	3.20	0.00	0.01	3.2	0.000
8.033	0.000	3.20	0.00	0.01	3.2	0.000
8.050	0.000	3.21	0.00	0.01	3.2	0.000
8.067	0.000	3.21	0.00	0.01	3.2	0.000
8.083	0.000	3.21	0.00	0.01	3.2	0.000
8.100	0.000	3.21	0.00	0.01	3.2	0.000
8.117	0.000	3.21	0.00	0.01	3.2	0.000
8.133	0.000	3.22	0.00	0.01	3.2	0.000
8.150	0.000	3.22	0.00	0.01	3.2	0.000
8.167	0.000	3.22	0.00	0.01	3.2	0.000
8.183	0.000	3.23	0.00	0.01	3.2	0.000
8.200	0.000	3.23	0.00	0.01	3.2	0.000
8.217	0.000	3.24	0.00	0.01	3.2	0.000
8.233	0.000	3.24	0.00	0.01	3.2	0.000
8.250	0.000	3.24	0.00	0.01	3.2	0.000
8.267	0.000	3.25	0.00	0.01	3.2	0.000
8.283	0.000	3.25	0.00	0.01	3.3	0.000
8.300	0.000	3.25	0.00	0.01	3.3	0.000
8.317	0.000	3.26	0.00	0.01	3.3	0.000
8.333	0.000	3.26	0.00	0.01	3.3	0.000
8.350	0.000	3.26	0.00	0.01	3.3	0.000
8.367	0.000	3.26	0.00	0.01	3.3	0.000
8.383	0.000	3.26	0.00	0.01	3.3	0.000
8.400	0.000	3.27	0.00	0.01	3.3	0.000
8.417	0.000	3.27	0.00	0.01	3.3	0.000
8.433	0.000	3.27	0.00	0.01	3.3	0.000
8.450	0.000	3.27	0.00	0.01	3.3	0.000
8.467	0.000	3.28	0.00	0.01	3.3	0.000
8.483	0.000	3.28	0.00	0.01	3.3	0.000
8.500	0.000	3.29	0.00	0.01	3.3	0.000
8.517	0.000	3.29	0.00	0.01	3.3	0.000
8.533	0.000	3.30	0.00	0.01	3.3	0.000
8.550	0.000	3.30	0.00	0.01	3.3	0.000
8.567	0.000	3.30	0.00	0.01	3.3	0.000
8.583	0.000	3.31	0.00	0.01	3.3	0.000
8.600	0.000	3.31	0.00	0.01	3.3	0.000
8.617	0.000	3.31	0.00	0.01	3.3	0.000
8.633	0.000	3.31	0.00	0.01	3.3	0.000
8.650	0.000	3.32	0.00	0.01	3.3	0.000
8.667	0.000	3.32	0.00	0.01	3.3	0.000
8.683	0.000	3.32	0.00	0.01	3.3	0.000
8.700	0.000	3.32	0.00	0.01	3.3	0.000
8.717	0.000	3.32	0.00	0.01	3.3	0.000
8.733	0.000	3.33	0.00	0.01	3.3	0.000
8.750	0.000	3.33	0.00	0.01	3.3	0.000
8.767	0.000	3.34	0.00	0.01	3.3	0.000
8.783	0.000	3.34	0.00	0.01	3.3	0.000
8.800	0.000	3.34	0.00	0.01	3.3	0.000
8.817	0.000	3.35	0.00	0.01	3.3	0.000

8.833	0.000	3.35	0.00	0.01	3.4	0.000
8.850	0.000	3.36	0.00	0.01	3.4	0.000
8.867	0.000	3.36	0.00	0.01	3.4	0.000
8.883	0.000	3.37	0.00	0.01	3.4	0.000
8.900	0.000	3.37	0.00	0.01	3.4	0.000
8.917	0.000	3.37	0.00	0.01	3.4	0.000
8.933	0.000	3.37	0.00	0.01	3.4	0.000
8.950	0.000	3.38	0.00	0.01	3.4	0.000
8.967	0.000	3.38	0.00	0.01	3.4	0.000
8.983	0.000	3.38	0.00	0.01	3.4	0.000
9.000	0.000	3.38	0.00	0.01	3.4	0.000
9.017	0.000	3.38	0.00	0.01	3.4	0.000
9.033	0.000	3.39	0.00	0.01	3.4	0.000
9.050	0.000	3.39	0.00	0.01	3.4	0.000
9.067	0.000	3.40	0.00	0.01	3.4	0.000
9.083	0.000	3.40	0.00	0.01	3.4	0.000
9.100	0.000	3.41	0.00	0.01	3.4	0.000
9.117	0.000	3.41	0.00	0.01	3.4	0.000
9.133	0.000	3.42	0.00	0.01	3.4	0.000
9.150	0.000	3.42	0.00	0.01	3.4	0.000
9.167	0.000	3.42	0.00	0.01	3.4	0.000
9.183	0.000	3.43	0.00	0.01	3.4	0.000
9.200	0.000	3.43	0.00	0.01	3.4	0.000
9.217	0.000	3.43	0.00	0.01	3.4	0.000
9.233	0.000	3.44	0.00	0.01	3.4	0.000
9.250	0.000	3.44	0.00	0.01	3.4	0.000
9.267	0.000	3.44	0.00	0.01	3.4	0.000
9.283	0.000	3.44	0.00	0.01	3.4	0.000
9.300	0.000	3.45	0.00	0.01	3.4	0.000
9.317	0.000	3.45	0.00	0.01	3.4	0.000
9.333	0.000	3.45	0.00	0.01	3.5	0.000
9.350	0.000	3.46	0.00	0.01	3.5	0.000
9.367	0.000	3.46	0.00	0.01	3.5	0.000
9.383	0.000	3.47	0.00	0.01	3.5	0.000
9.400	0.000	3.47	0.00	0.01	3.5	0.000
9.417	0.000	3.48	0.00	0.01	3.5	0.000
9.433	0.000	3.48	0.00	0.01	3.5	0.000
9.450	0.000	3.49	0.00	0.01	3.5	0.000
9.467	0.000	3.49	0.00	0.01	3.5	0.000
9.483	0.000	3.50	0.00	0.01	3.5	0.000
9.500	0.000	3.50	0.00	0.01	3.5	0.000
9.517	0.000	3.50	0.00	0.01	3.5	0.000
9.533	0.000	3.50	0.00	0.01	3.5	0.000
9.550	0.000	3.51	0.00	0.01	3.5	0.000
9.567	0.000	3.51	0.00	0.01	3.5	0.000
9.583	0.000	3.51	0.00	0.01	3.5	0.000
9.600	0.000	3.51	0.00	0.01	3.5	0.000
9.617	0.000	3.52	0.00	0.01	3.5	0.000
9.633	0.000	3.52	0.00	0.01	3.5	0.000
9.650	0.000	3.52	0.00	0.01	3.5	0.000
9.667	0.000	3.53	0.00	0.01	3.5	0.000
9.683	0.000	3.54	0.00	0.01	3.5	0.000
9.700	0.000	3.54	0.00	0.01	3.5	0.000
9.717	0.000	3.55	0.00	0.01	3.5	0.000
9.733	0.000	3.55	0.00	0.01	3.6	0.000
9.750	0.000	3.56	0.00	0.01	3.6	0.000
9.767	0.000	3.56	0.00	0.01	3.6	0.000
9.783	0.000	3.57	0.00	0.01	3.6	0.000
9.800	0.000	3.57	0.00	0.01	3.6	0.000
9.817	0.000	3.57	0.00	0.01	3.6	0.000
9.833	0.000	3.58	0.00	0.01	3.6	0.000
9.850	0.000	3.58	0.00	0.01	3.6	0.000
9.867	0.000	3.58	0.00	0.01	3.6	0.000
9.883	0.000	3.58	0.00	0.01	3.6	0.000
9.900	0.000	3.59	0.00	0.01	3.6	0.000
9.917	0.000	3.59	0.00	0.01	3.6	0.000
9.933	0.000	3.59	0.00	0.01	3.6	0.000
9.950	0.000	3.60	0.00	0.01	3.6	0.000
9.967	0.000	3.60	0.00	0.01	3.6	0.000
9.983	0.000	3.61	0.00	0.01	3.6	0.000
10.000	0.000	3.61	0.00	0.01	3.6	0.000
10.017	0.000	3.62	0.00	0.01	3.6	0.000
10.033	0.000	3.63	0.00	0.01	3.6	0.000
10.050	0.000	3.63	0.00	0.01	3.6	0.000
10.067	0.000	3.64	0.00	0.01	3.6	0.000
10.083	0.000	3.64	0.00	0.01	3.6	0.000
10.100	0.000	3.65	0.00	0.01	3.6	0.000
10.117	0.000	3.65	0.00	0.01	3.7	0.000
10.133	0.000	3.65	0.00	0.01	3.7	0.000

10.150	0.000	3.66	0.00	0.01	3.7	0.000
10.167	0.000	3.66	0.00	0.01	3.7	0.000
10.183	0.000	3.66	0.00	0.01	3.7	0.000
10.200	0.000	3.67	0.00	0.01	3.7	0.000
10.217	0.000	3.67	0.00	0.01	3.7	0.000
10.233	0.000	3.67	0.00	0.01	3.7	0.000
10.250	0.000	3.68	0.00	0.01	3.7	0.000
10.267	0.000	3.68	0.00	0.01	3.7	0.000
10.283	0.000	3.69	0.00	0.01	3.7	0.000
10.300	0.000	3.69	0.00	0.01	3.7	0.000
10.317	0.000	3.70	0.00	0.01	3.7	0.000
10.333	0.000	3.71	0.00	0.01	3.7	0.000
10.350	0.000	3.71	0.00	0.01	3.7	0.000
10.367	0.000	3.72	0.00	0.01	3.7	0.000
10.383	0.000	3.72	0.00	0.01	3.7	0.000
10.400	0.000	3.73	0.00	0.01	3.7	0.000
10.417	0.000	3.73	0.00	0.01	3.7	0.000
10.433	0.000	3.74	0.00	0.01	3.7	0.000
10.450	0.000	3.74	0.00	0.01	3.7	0.000
10.467	0.000	3.74	0.00	0.01	3.7	0.000
10.483	0.000	3.75	0.00	0.01	3.7	0.000
10.500	0.000	3.75	0.00	0.01	3.7	0.000
10.517	0.000	3.75	0.00	0.01	3.8	0.000
10.533	0.000	3.76	0.00	0.01	3.8	0.000
10.550	0.000	3.76	0.00	0.01	3.8	0.000
10.567	0.000	3.77	0.00	0.01	3.8	0.000
10.583	0.000	3.77	0.00	0.01	3.8	0.000
10.600	0.000	3.78	0.00	0.01	3.8	0.000
10.617	0.000	3.79	0.00	0.01	3.8	0.000
10.633	0.000	3.79	0.00	0.01	3.8	0.000
10.650	0.000	3.80	0.00	0.01	3.8	0.000
10.667	0.000	3.81	0.00	0.01	3.8	0.000
10.683	0.000	3.81	0.00	0.01	3.8	0.000
10.700	0.000	3.82	0.00	0.01	3.8	0.000
10.717	0.000	3.82	0.00	0.01	3.8	0.000
10.733	0.000	3.83	0.00	0.01	3.8	0.000
10.750	0.000	3.83	0.00	0.01	3.8	0.000
10.767	0.000	3.83	0.00	0.01	3.8	0.000
10.783	0.000	3.84	0.00	0.01	3.8	0.000
10.800	0.000	3.84	0.00	0.01	3.8	0.000
10.817	0.000	3.84	0.00	0.01	3.8	0.000
10.833	0.000	3.85	0.00	0.01	3.8	0.000
10.850	0.000	3.85	0.00	0.01	3.9	0.000
10.867	0.000	3.86	0.00	0.01	3.9	0.000
10.883	0.000	3.86	0.00	0.01	3.9	0.000
10.900	0.000	3.87	0.00	0.01	3.9	0.000
10.917	0.000	3.88	0.00	0.01	3.9	0.000
10.933	0.000	3.89	0.00	0.01	3.9	0.000
10.950	0.000	3.89	0.00	0.01	3.9	0.000
10.967	0.000	3.90	0.00	0.01	3.9	0.000
10.983	0.000	3.91	0.00	0.01	3.9	0.000
11.000	0.000	3.91	0.00	0.01	3.9	0.000
11.017	0.000	3.92	0.00	0.01	3.9	0.000
11.033	0.000	3.92	0.00	0.01	3.9	0.000
11.050	0.000	3.93	0.00	0.01	3.9	0.000
11.067	0.000	3.93	0.00	0.01	3.9	0.000
11.083	0.000	3.93	0.00	0.01	3.9	0.000
11.100	0.000	3.94	0.00	0.01	3.9	0.000
11.117	0.000	3.94	0.00	0.01	3.9	0.000
11.133	0.000	3.95	0.00	0.01	3.9	0.000
11.150	0.000	3.95	0.00	0.01	3.9	0.000
11.167	0.000	3.96	0.00	0.01	4.0	0.000
11.183	0.000	3.96	0.00	0.01	4.0	0.000
11.200	0.000	3.97	0.00	0.01	4.0	0.000
11.217	0.000	3.98	0.00	0.01	4.0	0.000
11.233	0.000	3.99	0.00	0.01	4.0	0.000
11.250	0.000	4.00	0.00	0.01	4.0	0.000
11.267	0.000	4.00	0.00	0.01	4.0	0.000
11.283	0.000	4.01	0.00	0.01	4.0	0.000
11.300	0.000	4.02	0.00	0.01	4.0	0.000
11.317	0.000	4.02	0.00	0.01	4.0	0.000
11.333	0.000	4.03	0.00	0.01	4.0	0.000
11.350	0.000	4.03	0.00	0.01	4.0	0.000
11.367	0.000	4.04	0.00	0.01	4.0	0.000
11.383	0.000	4.04	0.00	0.01	4.0	0.000
11.400	0.000	4.05	0.00	0.01	4.0	0.000
11.417	0.000	4.05	0.00	0.01	4.0	0.000
11.433	0.000	4.05	0.00	0.01	4.1	0.000
11.450	0.000	4.06	0.00	0.01	4.1	0.000

11.467	0.000	4.06	0.00	0.01	4.1	0.000
11.483	0.000	4.07	0.00	0.01	4.1	0.000
11.500	0.000	4.08	0.00	0.01	4.1	0.000
11.517	0.000	4.09	0.00	0.01	4.1	0.000
11.533	0.000	4.10	0.00	0.01	4.1	0.000
11.550	0.000	4.11	0.00	0.01	4.1	0.000
11.567	0.000	4.12	0.00	0.01	4.1	0.000
11.583	0.000	4.12	0.00	0.01	4.1	0.000
11.600	0.000	4.13	0.00	0.01	4.1	0.000
11.617	0.000	4.14	0.00	0.01	4.1	0.000
11.633	0.000	4.14	0.00	0.01	4.1	0.000
11.650	0.000	4.15	0.00	0.01	4.1	0.000
11.667	0.000	4.15	0.00	0.01	4.2	0.000
11.683	0.000	4.16	0.00	0.01	4.2	0.000
11.700	0.000	4.16	0.00	0.01	4.2	0.000
11.717	0.000	4.17	0.00	0.01	4.2	0.000
11.733	0.000	4.17	0.00	0.01	4.2	0.000
11.750	0.000	4.18	0.00	0.01	4.2	0.000
11.767	0.000	4.18	0.00	0.01	4.2	0.000
11.783	0.000	4.19	0.00	0.01	4.2	0.000
11.800	0.000	4.20	0.00	0.01	4.2	0.000
11.817	0.000	4.21	0.00	0.01	4.2	0.000
11.833	0.000	4.22	0.00	0.01	4.2	0.000
11.850	0.000	4.23	0.00	0.01	4.2	0.000
11.867	0.000	4.24	0.00	0.01	4.2	0.000
11.883	0.000	4.25	0.00	0.01	4.2	0.000
11.900	0.000	4.26	0.00	0.01	4.3	0.000
11.917	0.000	4.27	0.00	0.01	4.3	0.001
11.933	0.000	4.27	0.00	0.01	4.3	0.001
11.950	0.000	4.28	0.00	0.01	4.3	0.001
11.967	0.000	4.28	0.00	0.01	4.3	0.001
11.983	0.000	4.29	0.00	0.01	4.3	0.001
12.000	0.000	4.29	0.00	0.01	4.3	0.001
12.017	0.000	4.30	0.00	0.01	4.3	0.001
12.033	0.000	4.30	0.00	0.01	4.3	0.001
12.050	0.000	4.31	0.00	0.01	4.3	0.001
12.067	0.000	4.32	0.00	0.01	4.3	0.001
12.083	0.000	4.34	0.00	0.01	4.3	0.001
12.100	0.000	4.37	0.00	0.01	4.4	0.001
12.117	0.000	4.40	0.00	0.01	4.4	0.001
12.133	0.000	4.43	0.00	0.01	4.4	0.001
12.150	0.000	4.45	0.00	0.01	4.5	0.001
12.167	0.000	4.48	0.00	0.01	4.5	0.001
12.183	0.000	4.51	0.00	0.01	4.5	0.001
12.200	0.000	4.54	0.00	0.01	4.5	0.001
12.217	0.000	4.56	0.00	0.01	4.6	0.001
12.233	0.000	4.57	0.00	0.01	4.6	0.001
12.250	0.000	4.58	0.00	0.01	4.6	0.001
12.267	0.000	4.58	0.00	0.01	4.6	0.001
12.283	0.000	4.59	0.00	0.01	4.6	0.001
12.300	0.000	4.59	0.00	0.01	4.6	0.001
12.317	0.000	4.60	0.00	0.01	4.6	0.001
12.333	0.000	4.60	0.00	0.01	4.6	0.001
12.350	0.000	4.61	0.00	0.01	4.6	0.001
12.367	0.000	4.62	0.00	0.01	4.6	0.001
12.383	0.000	4.63	0.00	0.01	4.6	0.001
12.400	0.000	4.64	0.00	0.01	4.6	0.001
12.417	0.000	4.65	0.00	0.01	4.6	0.001
12.433	0.000	4.66	0.00	0.01	4.7	0.001
12.450	0.000	4.67	0.00	0.01	4.7	0.001
12.467	0.000	4.69	0.00	0.01	4.7	0.001
12.483	0.000	4.70	0.00	0.01	4.7	0.001
12.500	0.000	4.71	0.00	0.01	4.7	0.001
12.517	0.000	4.72	0.00	0.01	4.7	0.001
12.533	0.000	4.73	0.00	0.01	4.7	0.001
12.550	0.000	4.73	0.00	0.01	4.7	0.001
12.567	0.000	4.74	0.00	0.01	4.7	0.001
12.583	0.000	4.75	0.00	0.01	4.7	0.001
12.600	0.000	4.75	0.00	0.01	4.8	0.001
12.617	0.000	4.76	0.00	0.01	4.8	0.001
12.633	0.000	4.76	0.00	0.01	4.8	0.001
12.650	0.000	4.77	0.00	0.01	4.8	0.001
12.667	0.000	4.78	0.00	0.01	4.8	0.001
12.683	0.000	4.79	0.00	0.01	4.8	0.001
12.700	0.000	4.80	0.00	0.01	4.8	0.001
12.717	0.000	4.81	0.00	0.01	4.8	0.001
12.733	0.000	4.83	0.00	0.01	4.8	0.001
12.750	0.000	4.84	0.00	0.01	4.8	0.001
12.767	0.000	4.85	0.00	0.01	4.9	0.001

12.783	0.000	4.87	0.00	0.01	4.9	0.001
12.800	0.000	4.88	0.00	0.01	4.9	0.001
12.817	0.000	4.89	0.00	0.01	4.9	0.001
12.833	0.000	4.90	0.00	0.01	4.9	0.001
12.850	0.000	4.91	0.00	0.01	4.9	0.001
12.867	0.000	4.92	0.00	0.01	4.9	0.001
12.883	0.000	4.92	0.00	0.01	4.9	0.001
12.900	0.000	4.93	0.00	0.01	4.9	0.001
12.917	0.000	4.94	0.00	0.01	4.9	0.001
12.933	0.000	4.95	0.00	0.01	4.9	0.001
12.950	0.000	4.95	0.00	0.01	5.0	0.001
12.967	0.000	4.96	0.00	0.01	5.0	0.001
12.983	0.000	4.97	0.00	0.01	5.0	0.001
13.000	0.000	4.99	0.00	0.01	5.0	0.001
13.017	0.000	5.00	0.00	0.01	5.0	0.001
13.033	0.000	5.02	0.00	0.01	5.0	0.001
13.050	0.000	5.03	0.00	0.01	5.0	0.001
13.067	0.000	5.05	0.00	0.01	5.0	0.001
13.083	0.000	5.06	0.00	0.01	5.1	0.001
13.100	0.000	5.08	0.00	0.01	5.1	0.001
13.117	0.000	5.09	0.00	0.01	5.1	0.001
13.133	0.000	5.10	0.00	0.01	5.1	0.001
13.150	0.000	5.11	0.00	0.01	5.1	0.001
13.167	0.000	5.12	0.00	0.01	5.1	0.001
13.183	0.000	5.13	0.00	0.02	5.1	0.001
13.200	0.000	5.14	0.00	0.02	5.1	0.001
13.217	0.000	5.14	0.00	0.02	5.1	0.001
13.233	0.000	5.15	0.00	0.02	5.2	0.001
13.250	0.000	5.16	0.00	0.02	5.2	0.001
13.267	0.000	5.17	0.00	0.02	5.2	0.001
13.283	0.000	5.18	0.00	0.02	5.2	0.001
13.300	0.000	5.20	0.00	0.02	5.2	0.001
13.317	0.000	5.21	0.00	0.02	5.2	0.001
13.333	0.000	5.23	0.00	0.02	5.2	0.001
13.350	0.000	5.25	0.00	0.02	5.2	0.001
13.367	0.000	5.27	0.00	0.02	5.3	0.001
13.383	0.000	5.28	0.00	0.02	5.3	0.001
13.400	0.000	5.30	0.00	0.02	5.3	0.001
13.417	0.000	5.32	0.00	0.02	5.3	0.001
13.433	0.000	5.33	0.00	0.02	5.3	0.001
13.450	0.000	5.34	0.00	0.02	5.3	0.001
13.467	0.000	5.35	0.00	0.02	5.4	0.001
13.483	0.000	5.36	0.00	0.02	5.4	0.001
13.500	0.000	5.37	0.00	0.02	5.4	0.001
13.517	0.000	5.38	0.00	0.02	5.4	0.001
13.533	0.000	5.39	0.00	0.02	5.4	0.001
13.550	0.000	5.40	0.00	0.02	5.4	0.001
13.567	0.000	5.41	0.00	0.02	5.4	0.001
13.583	0.000	5.42	0.00	0.02	5.4	0.001
13.600	0.000	5.44	0.00	0.02	5.4	0.001
13.617	0.000	5.46	0.00	0.02	5.5	0.001
13.633	0.000	5.48	0.00	0.02	5.5	0.001
13.650	0.000	5.50	0.00	0.02	5.5	0.001
13.667	0.000	5.52	0.00	0.02	5.5	0.001
13.683	0.000	5.54	0.00	0.02	5.5	0.001
13.700	0.000	5.56	0.00	0.02	5.6	0.001
13.717	0.000	5.58	0.00	0.02	5.6	0.001
13.733	0.000	5.60	0.00	0.02	5.6	0.001
13.750	0.000	5.62	0.00	0.02	5.6	0.001
13.767	0.000	5.63	0.00	0.02	5.6	0.001
13.783	0.000	5.64	0.00	0.02	5.6	0.001
13.800	0.000	5.65	0.00	0.02	5.6	0.001
13.817	0.000	5.66	0.00	0.02	5.7	0.001
13.833	0.000	5.67	0.00	0.02	5.7	0.001
13.850	0.000	5.68	0.00	0.02	5.7	0.001
13.867	0.000	5.69	0.00	0.02	5.7	0.001
13.883	0.000	5.71	0.00	0.02	5.7	0.001
13.900	0.000	5.73	0.00	0.02	5.7	0.001
13.917	0.000	5.75	0.00	0.02	5.8	0.001
13.933	0.000	5.78	0.00	0.02	5.8	0.001
13.950	0.000	5.80	0.00	0.02	5.8	0.001
13.967	0.000	5.83	0.00	0.02	5.8	0.001
13.983	0.000	5.85	0.00	0.02	5.9	0.001
14.000	0.000	5.88	0.00	0.02	5.9	0.001
14.017	0.000	5.90	0.00	0.02	5.9	0.001
14.033	0.000	5.92	0.00	0.02	5.9	0.001
14.050	0.000	5.90	0.00	0.02	5.9	0.001
14.067	0.000	5.87	0.00	0.02	5.9	0.001
14.083	0.000	5.83	0.00	0.02	5.8	0.001

14.100	0.000	5.79	0.00	0.02	5.8	0.001
14.117	0.000	5.76	0.00	0.02	5.8	0.001
14.133	0.000	5.72	0.00	0.02	5.7	0.001
14.150	0.000	5.68	0.00	0.02	5.7	0.001
14.167	0.000	5.65	0.00	0.02	5.6	0.001
14.183	0.000	5.61	0.00	0.02	5.6	0.001
14.200	0.000	5.61	0.00	0.02	5.6	0.001
14.217	0.000	5.63	0.00	0.02	5.6	0.001
14.233	0.000	5.64	0.00	0.02	5.6	0.001
14.250	0.000	5.66	0.00	0.02	5.7	0.001
14.267	0.000	5.68	0.00	0.02	5.7	0.001
14.283	0.000	5.70	0.00	0.02	5.7	0.001
14.300	0.000	5.71	0.00	0.02	5.7	0.001
14.317	0.000	5.73	0.00	0.02	5.7	0.001
14.333	0.000	5.75	0.00	0.02	5.7	0.001
14.350	0.000	5.77	0.00	0.02	5.8	0.001
14.367	0.000	5.78	0.00	0.02	5.8	0.001
14.383	0.000	5.80	0.00	0.02	5.8	0.001
14.400	0.000	5.82	0.00	0.02	5.8	0.001
14.417	0.000	5.84	0.00	0.02	5.8	0.001
14.433	0.000	5.86	0.00	0.02	5.9	0.001
14.450	0.000	5.87	0.00	0.02	5.9	0.001
14.467	0.000	5.89	0.00	0.02	5.9	0.001
14.483	0.000	5.91	0.00	0.02	5.9	0.001
14.500	0.000	5.94	0.00	0.02	5.9	0.001
14.517	0.000	5.98	0.00	0.02	6.0	0.001
14.533	0.000	6.02	0.00	0.02	6.0	0.001
14.550	0.000	6.06	0.00	0.02	6.1	0.001
14.567	0.000	6.10	0.00	0.02	6.1	0.001
14.583	0.000	6.14	0.00	0.02	6.1	0.001
14.600	0.000	6.18	0.00	0.02	6.2	0.001
14.617	0.000	6.22	0.00	0.02	6.2	0.001
14.633	0.000	6.27	0.00	0.02	6.3	0.001
14.650	0.000	6.30	0.00	0.02	6.3	0.001
14.667	0.000	6.32	0.00	0.02	6.3	0.001
14.683	0.000	6.35	0.00	0.02	6.3	0.001
14.700	0.000	6.37	0.00	0.02	6.4	0.001
14.717	0.000	6.39	0.00	0.02	6.4	0.001
14.733	0.000	6.42	0.00	0.02	6.4	0.001
14.750	0.000	6.44	0.00	0.02	6.4	0.001
14.767	0.000	6.47	0.00	0.02	6.5	0.001
14.783	0.000	6.49	0.00	0.02	6.5	0.001
14.800	0.000	6.52	0.00	0.02	6.5	0.001
14.817	0.000	6.58	0.00	0.02	6.6	0.001
14.833	0.000	6.64	0.00	0.02	6.6	0.001
14.850	0.000	6.69	0.00	0.02	6.7	0.001
14.867	0.000	6.75	0.00	0.02	6.7	0.001
14.883	0.000	6.80	0.00	0.02	6.8	0.001
14.900	0.000	6.86	0.00	0.02	6.9	0.001
14.917	0.000	6.92	0.00	0.02	6.9	0.001
14.933	0.000	6.97	0.00	0.02	7.0	0.001
14.950	0.000	7.02	0.00	0.02	7.0	0.001
14.967	0.000	7.06	0.00	0.02	7.1	0.001
14.983	0.000	7.10	0.00	0.02	7.1	0.001
15.000	0.000	7.13	0.00	0.02	7.1	0.001
15.017	0.000	7.17	0.00	0.02	7.2	0.001
15.033	0.000	7.20	0.00	0.02	7.2	0.001
15.050	0.000	7.24	0.00	0.02	7.2	0.001
15.067	0.000	7.27	0.00	0.02	7.3	0.001
15.083	0.000	7.31	0.00	0.02	7.3	0.001
15.100	0.000	7.35	0.00	0.02	7.3	0.001
15.117	0.000	7.44	0.00	0.02	7.4	0.001
15.133	0.000	7.54	0.00	0.02	7.5	0.001
15.150	0.000	7.64	0.00	0.02	7.6	0.001
15.167	0.000	7.73	0.00	0.02	7.7	0.001
15.183	0.000	7.83	0.00	0.02	7.8	0.001
15.200	0.000	7.93	0.00	0.02	7.9	0.001
15.217	0.000	8.02	0.00	0.02	8.0	0.001
15.233	0.000	8.12	0.00	0.02	8.1	0.001
15.250	0.000	8.21	0.00	0.02	8.2	0.001
15.267	0.000	8.28	0.00	0.02	8.3	0.001
15.283	0.000	8.34	0.00	0.02	8.3	0.001
15.300	0.000	8.40	0.00	0.02	8.4	0.001
15.317	0.000	8.47	0.00	0.02	8.5	0.001
15.333	0.000	8.53	0.00	0.03	8.5	0.001
15.350	0.000	8.59	0.00	0.03	8.6	0.001
15.367	0.000	8.65	0.00	0.03	8.6	0.001
15.383	0.000	8.72	0.00	0.03	8.7	0.001
15.400	0.000	8.77	0.00	0.03	8.8	0.001

15.417	0.000	8.72	0.00	0.03	8.7	0.001
15.433	0.000	8.64	0.00	0.03	8.6	0.001
15.450	0.000	8.56	0.00	0.02	8.6	0.001
15.467	0.000	8.49	0.00	0.02	8.5	0.001
15.483	0.000	8.41	0.00	0.02	8.4	0.001
15.500	0.000	8.34	0.00	0.02	8.3	0.001
15.517	0.000	8.26	0.00	0.02	8.3	0.001
15.533	0.000	8.19	0.00	0.02	8.2	0.001
15.550	0.000	8.12	0.00	0.02	8.1	0.001
15.567	0.000	8.20	0.00	0.02	8.2	0.001
15.583	0.000	8.32	0.00	0.02	8.3	0.001
15.600	0.000	8.45	0.00	0.02	8.4	0.001
15.617	0.000	8.57	0.00	0.03	8.6	0.001
15.633	0.000	8.70	0.00	0.03	8.7	0.001
15.650	0.000	8.82	0.00	0.03	8.8	0.001
15.667	0.000	8.95	0.00	0.03	8.9	0.001
15.683	0.000	9.08	0.00	0.03	9.1	0.001
15.700	0.000	9.21	0.00	0.03	9.2	0.001
15.717	0.000	9.54	0.00	0.03	9.5	0.001
15.733	0.000	9.97	0.00	0.03	9.9	0.001
15.750	0.000	10.40	0.00	0.03	10.4	0.001
15.767	0.000	10.83	0.00	0.03	10.8	0.001
15.783	0.000	11.26	0.00	0.03	11.2	0.001
15.800	0.000	11.69	0.00	0.03	11.7	0.001
15.817	0.000	12.12	0.00	0.04	12.1	0.001
15.833	0.000	12.55	0.00	0.04	12.5	0.001
15.850	0.000	12.98	0.00	0.04	12.9	0.002
15.867	0.000	13.50	0.00	0.04	13.5	0.002
15.883	0.000	14.08	0.00	0.04	14.0	0.002
15.900	0.000	14.67	0.00	0.04	14.6	0.002
15.917	0.000	15.25	0.00	0.05	15.2	0.002
15.933	0.000	15.83	0.00	0.05	15.8	0.002
15.950	0.000	16.41	0.00	0.05	16.4	0.002
15.967	0.000	16.99	0.00	0.05	16.9	0.002
15.983	0.000	17.57	0.00	0.05	17.5	0.002
16.000	0.000	18.16	0.00	0.05	18.1	0.002
16.017	0.000	20.70	0.00	0.07	20.4	0.003
16.033	0.000	25.20	0.00	0.08	24.8	0.003
16.050	0.000	29.71	0.00	0.09	29.3	0.004
16.067	0.000	34.21	0.00	0.11	32.8	0.006
16.083	0.000	38.72	0.00	0.14	34.2	0.012
16.100	0.000	43.22	0.00	0.20	34.4	0.024
16.117	0.000	47.73	0.00	0.24	34.6	0.042
16.133	0.000	52.23	0.00	0.29	34.7	0.066
16.150	0.000	56.74	0.00	0.33	34.9	0.096
16.167	0.000	59.44	0.00	0.37	35.0	0.130
16.183	0.000	51.95	0.00	0.40	35.1	0.153
16.200	0.000	46.60	0.00	0.41	35.2	0.169
16.217	0.000	41.26	0.00	0.41	35.2	0.177
16.233	0.000	35.91	0.00	0.41	35.2	0.178
16.250	0.000	30.56	0.00	0.41	35.2	0.172
16.267	0.000	25.22	0.00	0.40	35.2	0.158
16.283	0.000	19.87	0.00	0.38	35.1	0.137
16.300	0.000	14.52	0.00	0.35	35.0	0.109
16.317	0.000	10.79	0.00	0.31	34.9	0.076
16.333	0.000	10.40	0.00	0.24	34.7	0.042
16.350	0.000	10.11	0.00	0.12	34.4	0.009
16.367	0.000	9.82	0.00	0.00	17.1	0.000
16.383	0.000	9.53	0.00	0.05	8.1	0.002
16.400	0.000	9.24	0.00	0.01	10.3	0.000
16.417	0.000	8.96	0.00	0.04	8.3	0.001
16.433	0.000	8.67	0.00	0.02	9.2	0.001
16.450	0.000	8.38	0.00	0.03	8.0	0.001
16.467	0.000	8.15	0.00	0.02	8.4	0.001
16.483	0.000	8.09	0.00	0.03	7.9	0.001
16.500	0.000	8.05	0.00	0.02	8.2	0.001
16.517	0.000	8.00	0.00	0.02	7.9	0.001
16.533	0.000	7.96	0.00	0.02	8.0	0.001
16.550	0.000	7.92	0.00	0.02	7.9	0.001
16.567	0.000	7.87	0.00	0.02	7.9	0.001
16.583	0.000	7.83	0.00	0.02	7.8	0.001
16.600	0.000	7.78	0.00	0.02	7.8	0.001
16.617	0.000	7.73	0.00	0.02	7.7	0.001
16.633	0.000	7.62	0.00	0.02	7.6	0.001
16.650	0.000	7.51	0.00	0.02	7.5	0.001
16.667	0.000	7.40	0.00	0.02	7.4	0.001
16.683	0.000	7.29	0.00	0.02	7.3	0.001
16.700	0.000	7.19	0.00	0.02	7.2	0.001
16.717	0.000	7.08	0.00	0.02	7.1	0.001

PEAK DISCHARGE

16.733	0.000	6.97	0.00	0.02	7.0	0.001
16.750	0.000	6.86	0.00	0.02	6.9	0.001
16.767	0.000	6.75	0.00	0.02	6.8	0.001
16.783	0.000	6.68	0.00	0.02	6.7	0.001
16.800	0.000	6.60	0.00	0.02	6.6	0.001
16.817	0.000	6.53	0.00	0.02	6.5	0.001
16.833	0.000	6.46	0.00	0.02	6.5	0.001
16.850	0.000	6.39	0.00	0.02	6.4	0.001
16.867	0.000	6.32	0.00	0.02	6.3	0.001
16.883	0.000	6.25	0.00	0.02	6.3	0.001
16.900	0.000	6.17	0.00	0.02	6.2	0.001
16.917	0.000	6.10	0.00	0.02	6.1	0.001
16.933	0.000	6.05	0.00	0.02	6.1	0.001
16.950	0.000	5.99	0.00	0.02	6.0	0.001
16.967	0.000	5.94	0.00	0.02	5.9	0.001
16.983	0.000	5.89	0.00	0.02	5.9	0.001
17.000	0.000	5.83	0.00	0.02	5.8	0.001
17.017	0.000	5.78	0.00	0.02	5.8	0.001
17.033	0.000	5.72	0.00	0.02	5.7	0.001
17.050	0.000	5.67	0.00	0.02	5.7	0.001
17.067	0.000	5.62	0.00	0.02	5.6	0.001
17.083	0.000	5.62	0.00	0.02	5.6	0.001
17.100	0.000	5.65	0.00	0.02	5.6	0.001
17.117	0.000	5.67	0.00	0.02	5.7	0.001
17.133	0.000	5.69	0.00	0.02	5.7	0.001
17.150	0.000	5.72	0.00	0.02	5.7	0.001
17.167	0.000	5.74	0.00	0.02	5.7	0.001
17.183	0.000	5.76	0.00	0.02	5.8	0.001
17.200	0.000	5.79	0.00	0.02	5.8	0.001
17.217	0.000	5.81	0.00	0.02	5.8	0.001
17.233	0.000	5.79	0.00	0.02	5.8	0.001
17.250	0.000	5.76	0.00	0.02	5.8	0.001
17.267	0.000	5.72	0.00	0.02	5.7	0.001
17.283	0.000	5.69	0.00	0.02	5.7	0.001
17.300	0.000	5.66	0.00	0.02	5.7	0.001
17.317	0.000	5.62	0.00	0.02	5.6	0.001
17.333	0.000	5.59	0.00	0.02	5.6	0.001
17.350	0.000	5.56	0.00	0.02	5.6	0.001
17.367	0.000	5.52	0.00	0.02	5.5	0.001
17.383	0.000	5.49	0.00	0.02	5.5	0.001
17.400	0.000	5.46	0.00	0.02	5.5	0.001
17.417	0.000	5.43	0.00	0.02	5.4	0.001
17.433	0.000	5.41	0.00	0.02	5.4	0.001
17.450	0.000	5.38	0.00	0.02	5.4	0.001
17.467	0.000	5.35	0.00	0.02	5.4	0.001
17.483	0.000	5.32	0.00	0.02	5.3	0.001
17.500	0.000	5.29	0.00	0.02	5.3	0.001
17.517	0.000	5.26	0.00	0.02	5.3	0.001
17.533	0.000	5.24	0.00	0.02	5.2	0.001
17.550	0.000	5.21	0.00	0.02	5.2	0.001
17.567	0.000	5.19	0.00	0.02	5.2	0.001
17.583	0.000	5.17	0.00	0.02	5.2	0.001
17.600	0.000	5.14	0.00	0.02	5.1	0.001
17.617	0.000	5.12	0.00	0.01	5.1	0.001
17.633	0.000	5.09	0.00	0.01	5.1	0.001
17.650	0.000	5.07	0.00	0.01	5.1	0.001
17.667	0.000	5.04	0.00	0.01	5.0	0.001
17.683	0.000	5.02	0.00	0.01	5.0	0.001
17.700	0.000	5.00	0.00	0.01	5.0	0.001
17.717	0.000	4.98	0.00	0.01	5.0	0.001
17.733	0.000	4.96	0.00	0.01	5.0	0.001
17.750	0.000	4.94	0.00	0.01	4.9	0.001
17.767	0.000	4.92	0.00	0.01	4.9	0.001
17.783	0.000	4.89	0.00	0.01	4.9	0.001
17.800	0.000	4.87	0.00	0.01	4.9	0.001
17.817	0.000	4.85	0.00	0.01	4.9	0.001
17.833	0.000	4.83	0.00	0.01	4.8	0.001
17.850	0.000	4.81	0.00	0.01	4.8	0.001
17.867	0.000	4.80	0.00	0.01	4.8	0.001
17.883	0.000	4.78	0.00	0.01	4.8	0.001
17.900	0.000	4.76	0.00	0.01	4.8	0.001
17.917	0.000	4.74	0.00	0.01	4.7	0.001
17.933	0.000	4.72	0.00	0.01	4.7	0.001
17.950	0.000	4.70	0.00	0.01	4.7	0.001
17.967	0.000	4.68	0.00	0.01	4.7	0.001
17.983	0.000	4.66	0.00	0.01	4.7	0.001
18.000	0.000	4.64	0.00	0.01	4.6	0.001
18.017	0.000	4.62	0.00	0.01	4.6	0.001
18.033	0.000	4.59	0.00	0.01	4.6	0.001

18.050	0.000	4.57	0.00	0.01	4.6	0.001
18.067	0.000	4.54	0.00	0.01	4.5	0.001
18.083	0.000	4.52	0.00	0.01	4.5	0.001
18.100	0.000	4.49	0.00	0.01	4.5	0.001
18.117	0.000	4.47	0.00	0.01	4.5	0.001
18.133	0.000	4.45	0.00	0.01	4.4	0.001
18.150	0.000	4.42	0.00	0.01	4.4	0.001
18.167	0.000	4.40	0.00	0.01	4.4	0.001
18.183	0.000	4.37	0.00	0.01	4.4	0.001
18.200	0.000	4.35	0.00	0.01	4.3	0.001
18.217	0.000	4.32	0.00	0.01	4.3	0.001
18.233	0.000	4.30	0.00	0.01	4.3	0.001
18.250	0.000	4.27	0.00	0.01	4.3	0.000
18.267	0.000	4.25	0.00	0.01	4.2	0.000
18.283	0.000	4.22	0.00	0.01	4.2	0.000
18.300	0.000	4.21	0.00	0.01	4.2	0.000
18.317	0.000	4.20	0.00	0.01	4.2	0.000
18.333	0.000	4.18	0.00	0.01	4.2	0.000
18.350	0.000	4.17	0.00	0.01	4.2	0.000
18.367	0.000	4.15	0.00	0.01	4.2	0.000
18.383	0.000	4.14	0.00	0.01	4.1	0.000
18.400	0.000	4.13	0.00	0.01	4.1	0.000
18.417	0.000	4.11	0.00	0.01	4.1	0.000
18.433	0.000	4.10	0.00	0.01	4.1	0.000
18.450	0.000	4.09	0.00	0.01	4.1	0.000
18.467	0.000	4.08	0.00	0.01	4.1	0.000
18.483	0.000	4.06	0.00	0.01	4.1	0.000
18.500	0.000	4.05	0.00	0.01	4.1	0.000
18.517	0.000	4.04	0.00	0.01	4.0	0.000
18.533	0.000	4.03	0.00	0.01	4.0	0.000
18.550	0.000	4.01	0.00	0.01	4.0	0.000
18.567	0.000	4.00	0.00	0.01	4.0	0.000
18.583	0.000	3.99	0.00	0.01	4.0	0.000
18.600	0.000	3.98	0.00	0.01	4.0	0.000
18.617	0.000	3.97	0.00	0.01	4.0	0.000
18.633	0.000	3.95	0.00	0.01	4.0	0.000
18.650	0.000	3.94	0.00	0.01	3.9	0.000
18.667	0.000	3.93	0.00	0.01	3.9	0.000
18.683	0.000	3.92	0.00	0.01	3.9	0.000
18.700	0.000	3.91	0.00	0.01	3.9	0.000
18.717	0.000	3.90	0.00	0.01	3.9	0.000
18.733	0.000	3.89	0.00	0.01	3.9	0.000
18.750	0.000	3.88	0.00	0.01	3.9	0.000
18.767	0.000	3.87	0.00	0.01	3.9	0.000
18.783	0.000	3.86	0.00	0.01	3.9	0.000
18.800	0.000	3.84	0.00	0.01	3.8	0.000
18.817	0.000	3.83	0.00	0.01	3.8	0.000
18.833	0.000	3.82	0.00	0.01	3.8	0.000
18.850	0.000	3.81	0.00	0.01	3.8	0.000
18.867	0.000	3.80	0.00	0.01	3.8	0.000
18.883	0.000	3.79	0.00	0.01	3.8	0.000
18.900	0.000	3.78	0.00	0.01	3.8	0.000
18.917	0.000	3.77	0.00	0.01	3.8	0.000
18.933	0.000	3.76	0.00	0.01	3.8	0.000
18.950	0.000	3.75	0.00	0.01	3.8	0.000
18.967	0.000	3.74	0.00	0.01	3.7	0.000
18.983	0.000	3.73	0.00	0.01	3.7	0.000
19.000	0.000	3.73	0.00	0.01	3.7	0.000
19.017	0.000	3.72	0.00	0.01	3.7	0.000
19.033	0.000	3.71	0.00	0.01	3.7	0.000
19.050	0.000	3.70	0.00	0.01	3.7	0.000
19.067	0.000	3.69	0.00	0.01	3.7	0.000
19.083	0.000	3.68	0.00	0.01	3.7	0.000
19.100	0.000	3.67	0.00	0.01	3.7	0.000
19.117	0.000	3.66	0.00	0.01	3.7	0.000
19.133	0.000	3.65	0.00	0.01	3.7	0.000
19.150	0.000	3.64	0.00	0.01	3.6	0.000
19.167	0.000	3.63	0.00	0.01	3.6	0.000
19.183	0.000	3.63	0.00	0.01	3.6	0.000
19.200	0.000	3.62	0.00	0.01	3.6	0.000
19.217	0.000	3.61	0.00	0.01	3.6	0.000
19.233	0.000	3.60	0.00	0.01	3.6	0.000
19.250	0.000	3.59	0.00	0.01	3.6	0.000
19.267	0.000	3.58	0.00	0.01	3.6	0.000
19.283	0.000	3.58	0.00	0.01	3.6	0.000
19.300	0.000	3.57	0.00	0.01	3.6	0.000
19.317	0.000	3.56	0.00	0.01	3.6	0.000
19.333	0.000	3.55	0.00	0.01	3.6	0.000
19.350	0.000	3.54	0.00	0.01	3.5	0.000

19.367	0.000	3.53	0.00	0.01	3.5	0.000
19.383	0.000	3.53	0.00	0.01	3.5	0.000
19.400	0.000	3.52	0.00	0.01	3.5	0.000
19.417	0.000	3.51	0.00	0.01	3.5	0.000
19.433	0.000	3.50	0.00	0.01	3.5	0.000
19.450	0.000	3.50	0.00	0.01	3.5	0.000
19.467	0.000	3.49	0.00	0.01	3.5	0.000
19.483	0.000	3.48	0.00	0.01	3.5	0.000
19.500	0.000	3.47	0.00	0.01	3.5	0.000
19.517	0.000	3.47	0.00	0.01	3.5	0.000
19.533	0.000	3.46	0.00	0.01	3.5	0.000
19.550	0.000	3.45	0.00	0.01	3.5	0.000
19.567	0.000	3.44	0.00	0.01	3.4	0.000
19.583	0.000	3.44	0.00	0.01	3.4	0.000
19.600	0.000	3.43	0.00	0.01	3.4	0.000
19.617	0.000	3.42	0.00	0.01	3.4	0.000
19.633	0.000	3.41	0.00	0.01	3.4	0.000
19.650	0.000	3.41	0.00	0.01	3.4	0.000
19.667	0.000	3.40	0.00	0.01	3.4	0.000
19.683	0.000	3.39	0.00	0.01	3.4	0.000
19.700	0.000	3.39	0.00	0.01	3.4	0.000
19.717	0.000	3.38	0.00	0.01	3.4	0.000
19.733	0.000	3.37	0.00	0.01	3.4	0.000
19.750	0.000	3.37	0.00	0.01	3.4	0.000
19.767	0.000	3.36	0.00	0.01	3.4	0.000
19.783	0.000	3.35	0.00	0.01	3.4	0.000
19.800	0.000	3.35	0.00	0.01	3.3	0.000
19.817	0.000	3.34	0.00	0.01	3.3	0.000
19.833	0.000	3.33	0.00	0.01	3.3	0.000
19.850	0.000	3.33	0.00	0.01	3.3	0.000
19.867	0.000	3.32	0.00	0.01	3.3	0.000
19.883	0.000	3.31	0.00	0.01	3.3	0.000
19.900	0.000	3.31	0.00	0.01	3.3	0.000
19.917	0.000	3.30	0.00	0.01	3.3	0.000
19.933	0.000	3.29	0.00	0.01	3.3	0.000
19.950	0.000	3.29	0.00	0.01	3.3	0.000
19.967	0.000	3.28	0.00	0.01	3.3	0.000
19.983	0.000	3.28	0.00	0.01	3.3	0.000
20.000	0.000	3.27	0.00	0.01	3.3	0.000
20.017	0.000	3.26	0.00	0.01	3.3	0.000
20.033	0.000	3.26	0.00	0.01	3.3	0.000
20.050	0.000	3.25	0.00	0.01	3.3	0.000
20.067	0.000	3.25	0.00	0.01	3.2	0.000
20.083	0.000	3.24	0.00	0.01	3.2	0.000
20.100	0.000	3.23	0.00	0.01	3.2	0.000
20.117	0.000	3.23	0.00	0.01	3.2	0.000
20.133	0.000	3.22	0.00	0.01	3.2	0.000
20.150	0.000	3.22	0.00	0.01	3.2	0.000
20.167	0.000	3.21	0.00	0.01	3.2	0.000
20.183	0.000	3.20	0.00	0.01	3.2	0.000
20.200	0.000	3.20	0.00	0.01	3.2	0.000
20.217	0.000	3.19	0.00	0.01	3.2	0.000
20.233	0.000	3.19	0.00	0.01	3.2	0.000
20.250	0.000	3.18	0.00	0.01	3.2	0.000
20.267	0.000	3.18	0.00	0.01	3.2	0.000
20.283	0.000	3.17	0.00	0.01	3.2	0.000
20.300	0.000	3.16	0.00	0.01	3.2	0.000
20.317	0.000	3.16	0.00	0.01	3.2	0.000
20.333	0.000	3.15	0.00	0.01	3.2	0.000
20.350	0.000	3.15	0.00	0.01	3.1	0.000
20.367	0.000	3.14	0.00	0.01	3.1	0.000
20.383	0.000	3.14	0.00	0.01	3.1	0.000
20.400	0.000	3.13	0.00	0.01	3.1	0.000
20.417	0.000	3.13	0.00	0.01	3.1	0.000
20.433	0.000	3.12	0.00	0.01	3.1	0.000
20.450	0.000	3.12	0.00	0.01	3.1	0.000
20.467	0.000	3.11	0.00	0.01	3.1	0.000
20.483	0.000	3.11	0.00	0.01	3.1	0.000
20.500	0.000	3.10	0.00	0.01	3.1	0.000
20.517	0.000	3.10	0.00	0.01	3.1	0.000
20.533	0.000	3.09	0.00	0.01	3.1	0.000
20.550	0.000	3.09	0.00	0.01	3.1	0.000
20.567	0.000	3.08	0.00	0.01	3.1	0.000
20.583	0.000	3.08	0.00	0.01	3.1	0.000
20.600	0.000	3.07	0.00	0.01	3.1	0.000
20.617	0.000	3.07	0.00	0.01	3.1	0.000
20.633	0.000	3.06	0.00	0.01	3.1	0.000
20.650	0.000	3.06	0.00	0.01	3.1	0.000
20.667	0.000	3.05	0.00	0.01	3.1	0.000

20.683	0.000	3.05	0.00	0.01	3.0	0.000
20.700	0.000	3.04	0.00	0.01	3.0	0.000
20.717	0.000	3.04	0.00	0.01	3.0	0.000
20.733	0.000	3.03	0.00	0.01	3.0	0.000
20.750	0.000	3.03	0.00	0.01	3.0	0.000
20.767	0.000	3.02	0.00	0.01	3.0	0.000
20.783	0.000	3.02	0.00	0.01	3.0	0.000
20.800	0.000	3.01	0.00	0.01	3.0	0.000
20.817	0.000	3.01	0.00	0.01	3.0	0.000
20.833	0.000	3.00	0.00	0.01	3.0	0.000
20.850	0.000	3.00	0.00	0.01	3.0	0.000
20.867	0.000	2.99	0.00	0.01	3.0	0.000
20.883	0.000	2.99	0.00	0.01	3.0	0.000
20.900	0.000	2.98	0.00	0.01	3.0	0.000
20.917	0.000	2.98	0.00	0.01	3.0	0.000
20.933	0.000	2.98	0.00	0.01	3.0	0.000
20.950	0.000	2.97	0.00	0.01	3.0	0.000
20.967	0.000	2.97	0.00	0.01	3.0	0.000
20.983	0.000	2.96	0.00	0.01	3.0	0.000
21.000	0.000	2.96	0.00	0.01	3.0	0.000
21.017	0.000	2.95	0.00	0.01	3.0	0.000
21.033	0.000	2.95	0.00	0.01	2.9	0.000
21.050	0.000	2.94	0.00	0.01	2.9	0.000
21.067	0.000	2.94	0.00	0.01	2.9	0.000
21.083	0.000	2.94	0.00	0.01	2.9	0.000
21.100	0.000	2.93	0.00	0.01	2.9	0.000
21.117	0.000	2.93	0.00	0.01	2.9	0.000
21.133	0.000	2.92	0.00	0.01	2.9	0.000
21.150	0.000	2.92	0.00	0.01	2.9	0.000
21.167	0.000	2.91	0.00	0.01	2.9	0.000
21.183	0.000	2.91	0.00	0.01	2.9	0.000
21.200	0.000	2.91	0.00	0.01	2.9	0.000
21.217	0.000	2.90	0.00	0.01	2.9	0.000
21.233	0.000	2.90	0.00	0.01	2.9	0.000
21.250	0.000	2.89	0.00	0.01	2.9	0.000
21.267	0.000	2.89	0.00	0.01	2.9	0.000
21.283	0.000	2.89	0.00	0.01	2.9	0.000
21.300	0.000	2.88	0.00	0.01	2.9	0.000
21.317	0.000	2.88	0.00	0.01	2.9	0.000
21.333	0.000	2.87	0.00	0.01	2.9	0.000
21.350	0.000	2.87	0.00	0.01	2.9	0.000
21.367	0.000	2.87	0.00	0.01	2.9	0.000
21.383	0.000	2.86	0.00	0.01	2.9	0.000
21.400	0.000	2.86	0.00	0.01	2.9	0.000
21.417	0.000	2.85	0.00	0.01	2.9	0.000
21.433	0.000	2.85	0.00	0.01	2.8	0.000
21.450	0.000	2.85	0.00	0.01	2.8	0.000
21.467	0.000	2.84	0.00	0.01	2.8	0.000
21.483	0.000	2.84	0.00	0.01	2.8	0.000
21.500	0.000	2.83	0.00	0.01	2.8	0.000
21.517	0.000	2.83	0.00	0.01	2.8	0.000
21.533	0.000	2.83	0.00	0.01	2.8	0.000
21.550	0.000	2.82	0.00	0.01	2.8	0.000
21.567	0.000	2.82	0.00	0.01	2.8	0.000
21.583	0.000	2.82	0.00	0.01	2.8	0.000
21.600	0.000	2.81	0.00	0.01	2.8	0.000
21.617	0.000	2.81	0.00	0.01	2.8	0.000
21.633	0.000	2.80	0.00	0.01	2.8	0.000
21.650	0.000	2.80	0.00	0.01	2.8	0.000
21.667	0.000	2.80	0.00	0.01	2.8	0.000
21.683	0.000	2.79	0.00	0.01	2.8	0.000
21.700	0.000	2.79	0.00	0.01	2.8	0.000
21.717	0.000	2.79	0.00	0.01	2.8	0.000
21.733	0.000	2.78	0.00	0.01	2.8	0.000
21.750	0.000	2.78	0.00	0.01	2.8	0.000
21.767	0.000	2.77	0.00	0.01	2.8	0.000
21.783	0.000	2.77	0.00	0.01	2.8	0.000
21.800	0.000	2.77	0.00	0.01	2.8	0.000
21.817	0.000	2.76	0.00	0.01	2.8	0.000
21.833	0.000	2.76	0.00	0.01	2.8	0.000
21.850	0.000	2.76	0.00	0.01	2.8	0.000
21.867	0.000	2.75	0.00	0.01	2.8	0.000
21.883	0.000	2.75	0.00	0.01	2.8	0.000
21.900	0.000	2.75	0.00	0.01	2.7	0.000
21.917	0.000	2.74	0.00	0.01	2.7	0.000
21.933	0.000	2.74	0.00	0.01	2.7	0.000
21.950	0.000	2.74	0.00	0.01	2.7	0.000
21.967	0.000	2.73	0.00	0.01	2.7	0.000
21.983	0.000	2.73	0.00	0.01	2.7	0.000

22.000	0.000	2.73	0.00	0.01	2.7	0.000
22.017	0.000	2.72	0.00	0.01	2.7	0.000
22.033	0.000	2.72	0.00	0.01	2.7	0.000
22.050	0.000	2.72	0.00	0.01	2.7	0.000
22.067	0.000	2.71	0.00	0.01	2.7	0.000
22.083	0.000	2.71	0.00	0.01	2.7	0.000
22.100	0.000	2.71	0.00	0.01	2.7	0.000
22.117	0.000	2.70	0.00	0.01	2.7	0.000
22.133	0.000	2.70	0.00	0.01	2.7	0.000
22.150	0.000	2.70	0.00	0.01	2.7	0.000
22.167	0.000	2.69	0.00	0.01	2.7	0.000
22.183	0.000	2.69	0.00	0.01	2.7	0.000
22.200	0.000	2.69	0.00	0.01	2.7	0.000
22.216	0.000	2.68	0.00	0.01	2.7	0.000
22.233	0.000	2.68	0.00	0.01	2.7	0.000
22.250	0.000	2.68	0.00	0.01	2.7	0.000
22.266	0.000	2.67	0.00	0.01	2.7	0.000
22.283	0.000	2.67	0.00	0.01	2.7	0.000
22.300	0.000	2.67	0.00	0.01	2.7	0.000
22.316	0.000	2.66	0.00	0.01	2.7	0.000
22.333	0.000	2.66	0.00	0.01	2.7	0.000
22.350	0.000	2.66	0.00	0.01	2.7	0.000
22.366	0.000	2.66	0.00	0.01	2.7	0.000
22.383	0.000	2.65	0.00	0.01	2.7	0.000
22.400	0.000	2.65	0.00	0.01	2.6	0.000
22.416	0.000	2.65	0.00	0.01	2.6	0.000
22.433	0.000	2.64	0.00	0.01	2.6	0.000
22.450	0.000	2.64	0.00	0.01	2.6	0.000
22.466	0.000	2.64	0.00	0.01	2.6	0.000
22.483	0.000	2.63	0.00	0.01	2.6	0.000
22.500	0.000	2.63	0.00	0.01	2.6	0.000
22.516	0.000	2.63	0.00	0.01	2.6	0.000
22.533	0.000	2.62	0.00	0.01	2.6	0.000
22.550	0.000	2.62	0.00	0.01	2.6	0.000
22.566	0.000	2.62	0.00	0.01	2.6	0.000
22.583	0.000	2.62	0.00	0.01	2.6	0.000
22.600	0.000	2.61	0.00	0.01	2.6	0.000
22.616	0.000	2.61	0.00	0.01	2.6	0.000
22.633	0.000	2.61	0.00	0.01	2.6	0.000
22.650	0.000	2.60	0.00	0.01	2.6	0.000
22.666	0.000	2.60	0.00	0.01	2.6	0.000
22.683	0.000	2.60	0.00	0.01	2.6	0.000
22.700	0.000	2.60	0.00	0.01	2.6	0.000
22.716	0.000	2.59	0.00	0.01	2.6	0.000
22.733	0.000	2.59	0.00	0.01	2.6	0.000
22.750	0.000	2.59	0.00	0.01	2.6	0.000
22.766	0.000	2.58	0.00	0.01	2.6	0.000
22.783	0.000	2.58	0.00	0.01	2.6	0.000
22.800	0.000	2.58	0.00	0.01	2.6	0.000
22.816	0.000	2.58	0.00	0.01	2.6	0.000
22.833	0.000	2.57	0.00	0.01	2.6	0.000
22.850	0.000	2.57	0.00	0.01	2.6	0.000
22.866	0.000	2.57	0.00	0.01	2.6	0.000
22.883	0.000	2.56	0.00	0.01	2.6	0.000
22.900	0.000	2.56	0.00	0.01	2.6	0.000
22.916	0.000	2.56	0.00	0.01	2.6	0.000
22.933	0.000	2.56	0.00	0.01	2.6	0.000
22.950	0.000	2.55	0.00	0.01	2.6	0.000
22.966	0.000	2.55	0.00	0.01	2.6	0.000
22.983	0.000	2.55	0.00	0.01	2.5	0.000
23.000	0.000	2.55	0.00	0.01	2.5	0.000
23.016	0.000	2.54	0.00	0.01	2.5	0.000
23.033	0.000	2.54	0.00	0.01	2.5	0.000
23.050	0.000	2.54	0.00	0.01	2.5	0.000
23.066	0.000	2.53	0.00	0.01	2.5	0.000
23.083	0.000	2.53	0.00	0.01	2.5	0.000
23.100	0.000	2.53	0.00	0.01	2.5	0.000
23.116	0.000	2.53	0.00	0.01	2.5	0.000
23.133	0.000	2.52	0.00	0.01	2.5	0.000
23.150	0.000	2.52	0.00	0.01	2.5	0.000
23.166	0.000	2.52	0.00	0.01	2.5	0.000
23.183	0.000	2.52	0.00	0.01	2.5	0.000
23.200	0.000	2.51	0.00	0.01	2.5	0.000
23.216	0.000	2.51	0.00	0.01	2.5	0.000
23.233	0.000	2.51	0.00	0.01	2.5	0.000
23.250	0.000	2.51	0.00	0.01	2.5	0.000
23.266	0.000	2.50	0.00	0.01	2.5	0.000
23.283	0.000	2.50	0.00	0.01	2.5	0.000
23.300	0.000	2.50	0.00	0.01	2.5	0.000

23.316	0.000	2.50	0.00	0.01	2.5	0.000
23.333	0.000	2.49	0.00	0.01	2.5	0.000
23.350	0.000	2.49	0.00	0.01	2.5	0.000
23.366	0.000	2.49	0.00	0.01	2.5	0.000
23.383	0.000	2.49	0.00	0.01	2.5	0.000
23.400	0.000	2.48	0.00	0.01	2.5	0.000
23.416	0.000	2.48	0.00	0.01	2.5	0.000
23.433	0.000	2.48	0.00	0.01	2.5	0.000
23.450	0.000	2.48	0.00	0.01	2.5	0.000
23.466	0.000	2.47	0.00	0.01	2.5	0.000
23.483	0.000	2.47	0.00	0.01	2.5	0.000
23.500	0.000	2.47	0.00	0.01	2.5	0.000
23.516	0.000	2.47	0.00	0.01	2.5	0.000
23.533	0.000	2.46	0.00	0.01	2.5	0.000
23.550	0.000	2.46	0.00	0.01	2.5	0.000
23.566	0.000	2.46	0.00	0.01	2.5	0.000
23.583	0.000	2.46	0.00	0.01	2.5	0.000
23.600	0.000	2.45	0.00	0.01	2.5	0.000
23.616	0.000	2.45	0.00	0.01	2.5	0.000
23.633	0.000	2.45	0.00	0.01	2.4	0.000
23.650	0.000	2.45	0.00	0.01	2.4	0.000
23.666	0.000	2.44	0.00	0.01	2.4	0.000
23.683	0.000	2.44	0.00	0.01	2.4	0.000
23.700	0.000	2.44	0.00	0.01	2.4	0.000
23.716	0.000	2.44	0.00	0.01	2.4	0.000
23.733	0.000	2.44	0.00	0.01	2.4	0.000
23.750	0.000	2.43	0.00	0.01	2.4	0.000
23.766	0.000	2.43	0.00	0.01	2.4	0.000
23.783	0.000	2.43	0.00	0.01	2.4	0.000
23.800	0.000	2.43	0.00	0.01	2.4	0.000
23.816	0.000	2.42	0.00	0.01	2.4	0.000
23.833	0.000	2.42	0.00	0.01	2.4	0.000
23.850	0.000	2.42	0.00	0.01	2.4	0.000
23.866	0.000	2.42	0.00	0.01	2.4	0.000
23.883	0.000	2.41	0.00	0.01	2.4	0.000
23.900	0.000	2.41	0.00	0.01	2.4	0.000
23.916	0.000	2.41	0.00	0.01	2.4	0.000
23.933	0.000	2.41	0.00	0.01	2.4	0.000
23.950	0.000	2.41	0.00	0.01	2.4	0.000
23.966	0.000	2.40	0.00	0.01	2.4	0.000
23.983	0.000	2.40	0.00	0.01	2.4	0.000
24.000	0.000	2.40	0.00	0.01	2.4	0.000
24.016	0.000	2.40	0.00	0.01	2.4	0.000
24.033	0.000	2.39	0.00	0.01	2.4	0.000
24.050	0.000	2.33	0.00	0.01	2.3	0.000
24.066	0.000	2.08	0.00	0.01	2.1	0.000
24.083	0.000	1.81	0.00	0.01	1.8	0.000
24.100	0.000	1.55	0.00	0.00	1.6	0.000
24.116	0.000	1.29	0.00	0.00	1.3	0.000
24.133	0.000	1.03	0.00	0.00	1.0	0.000
24.150	0.000	0.76	0.00	0.00	0.8	0.000
24.166	0.000	0.50	0.00	0.00	0.5	0.000
24.183	0.000	0.24	0.00	0.00	0.3	0.000
24.200	0.000	0.00	0.00	0.00	0.1	0.000
24.216	0.000	0.00	0.00	0.00	0.0	0.000
24.233	0.000	0.00	0.00	0.00	0.0	0.000
24.250	0.000	0.00	0.00	0.00	0.0	0.000
24.266	0.000	0.00	0.00	0.00	0.0	0.000
24.283	0.000	0.00	0.00	0.00	0.0	0.000
24.300	0.000	0.00	0.00	0.00	0.0	0.000
24.316	0.000	0.00	0.00	0.00	0.0	0.000
24.333	0.000	0.00	0.00	0.00	0.0	0.000
24.350	0.000	0.00	0.00	0.00	0.0	0.000
24.366	0.000	0.00	0.00	0.00	0.0	0.000
24.383	0.000	0.00	0.00	0.00	0.0	0.000
24.400	0.000	0.00	0.00	0.00	0.0	0.000
24.416	0.000	0.00	0.00	0.00	0.0	0.000
24.433	0.000	0.00	0.00	0.00	0.0	0.000
24.450	0.000	0.00	0.00	0.00	0.0	0.000
24.466	0.000	0.00	0.00	0.00	0.0	0.000
24.483	0.000	0.00	0.00	0.00	0.0	0.000
24.500	0.000	0.00	0.00	0.00	0.0	0.000
24.516	0.000	0.00	0.00	0.00	0.0	0.000
24.533	0.000	0.00	0.00	0.00	0.0	0.000
24.550	0.000	0.00	0.00	0.00	0.0	0.000
24.566	0.000	0.00	0.00	0.00	0.0	0.000
24.583	0.000	0.00	0.00	0.00	0.0	0.000
24.600	0.000	0.00	0.00	0.00	0.0	0.000
24.616	0.000	0.00	0.00	0.00	0.0	0.000

24.633	0.000	0.00	0.00	0.00	0.0	0.000
24.650	0.000	0.00	0.00	0.00	0.0	0.000
24.666	0.000	0.00	0.00	0.00	0.0	0.000
24.683	0.000	0.00	0.00	0.00	0.0	0.000
24.700	0.000	0.00	0.00	0.00	0.0	0.000
24.716	0.000	0.00	0.00	0.00	0.0	0.000
24.733	0.000	0.00	0.00	0.00	0.0	0.000
24.750	0.000	0.00	0.00	0.00	0.0	0.000
24.766	0.000	0.00	0.00	0.00	0.0	0.000
24.783	0.000	0.00	0.00	0.00	0.0	0.000
24.800	0.000	0.00	0.00	0.00	0.0	0.000
24.816	0.000	0.00	0.00	0.00	0.0	0.000
24.833	0.000	0.00	0.00	0.00	0.0	0.000
24.850	0.000	0.00	0.00	0.00	0.0	0.000
24.866	0.000	0.00	0.00	0.00	0.0	0.000
24.883	0.000	0.00	0.00	0.00	0.0	0.000
24.900	0.000	0.00	0.00	0.00	0.0	0.000
24.916	0.000	0.00	0.00	0.00	0.0	0.000
24.933	0.000	0.00	0.00	0.00	0.0	0.000
24.950	0.000	0.00	0.00	0.00	0.0	0.000
24.966	0.000	0.00	0.00	0.00	0.0	0.000
24.983	0.000	0.00	0.00	0.00	0.0	0.000
25.000	0.000	0.00	0.00	0.00	0.0	0.000
25.016	0.000	0.00	0.00	0.00	0.0	0.000
25.033	0.000	0.00	0.00	0.00	0.0	0.000
25.050	0.000	0.00	0.00	0.00	0.0	0.000
25.066	0.000	0.00	0.00	0.00	0.0	0.000
25.083	0.000	0.00	0.00	0.00	0.0	0.000
25.100	0.000	0.00	0.00	0.00	0.0	0.000
25.116	0.000	0.00	0.00	0.00	0.0	0.000
25.133	0.000	0.00	0.00	0.00	0.0	0.000
25.150	0.000	0.00	0.00	0.00	0.0	0.000
25.166	0.000	0.00	0.00	0.00	0.0	0.000
25.183	0.000	0.00	0.00	0.00	0.0	0.000
25.200	0.000	0.00	0.00	0.00	0.0	0.000
25.216	0.000	0.00	0.00	0.00	0.0	0.000
25.233	0.000	0.00	0.00	0.00	0.0	0.000
25.250	0.000	0.00	0.00	0.00	0.0	0.000
25.266	0.000	0.00	0.00	0.00	0.0	0.000
25.283	0.000	0.00	0.00	0.00	0.0	0.000
25.300	0.000	0.00	0.00	0.00	0.0	0.000
25.316	0.000	0.00	0.00	0.00	0.0	0.000
25.333	0.000	0.00	0.00	0.00	0.0	0.000
25.350	0.000	0.00	0.00	0.00	0.0	0.000
25.366	0.000	0.00	0.00	0.00	0.0	0.000
25.383	0.000	0.00	0.00	0.00	0.0	0.000
25.400	0.000	0.00	0.00	0.00	0.0	0.000
25.416	0.000	0.00	0.00	0.00	0.0	0.000
25.433	0.000	0.00	0.00	0.00	0.0	0.000
25.450	0.000	0.00	0.00	0.00	0.0	0.000
25.466	0.000	0.00	0.00	0.00	0.0	0.000
25.483	0.000	0.00	0.00	0.00	0.0	0.000
25.500	0.000	0.00	0.00	0.00	0.0	0.000
25.516	0.000	0.00	0.00	0.00	0.0	0.000
25.533	0.000	0.00	0.00	0.00	0.0	0.000
25.550	0.000	0.00	0.00	0.00	0.0	0.000
25.566	0.000	0.00	0.00	0.00	0.0	0.000
25.583	0.000	0.00	0.00	0.00	0.0	0.000
25.600	0.000	0.00	0.00	0.00	0.0	0.000
25.616	0.000	0.00	0.00	0.00	0.0	0.000
25.633	0.000	0.00	0.00	0.00	0.0	0.000
25.650	0.000	0.00	0.00	0.00	0.0	0.000
25.666	0.000	0.00	0.00	0.00	0.0	0.000
25.683	0.000	0.00	0.00	0.00	0.0	0.000
25.700	0.000	0.00	0.00	0.00	0.0	0.000
25.716	0.000	0.00	0.00	0.00	0.0	0.000
25.733	0.000	0.00	0.00	0.00	0.0	0.000
25.750	0.000	0.00	0.00	0.00	0.0	0.000
25.766	0.000	0.00	0.00	0.00	0.0	0.000
25.783	0.000	0.00	0.00	0.00	0.0	0.000
25.800	0.000	0.00	0.00	0.00	0.0	0.000
25.816	0.000	0.00	0.00	0.00	0.0	0.000
25.833	0.000	0.00	0.00	0.00	0.0	0.000
25.850	0.000	0.00	0.00	0.00	0.0	0.000
25.866	0.000	0.00	0.00	0.00	0.0	0.000
25.883	0.000	0.00	0.00	0.00	0.0	0.000
25.900	0.000	0.00	0.00	0.00	0.0	0.000
25.916	0.000	0.00	0.00	0.00	0.0	0.000
25.933	0.000	0.00	0.00	0.00	0.0	0.000

25.950	0.000	0.00	0.00	0.00	0.0	0.000
25.966	0.000	0.00	0.00	0.00	0.0	0.000
25.983	0.000	0.00	0.00	0.00	0.0	0.000
26.000	0.000	0.00	0.00	0.00	0.0	0.000
26.016	0.000	0.00	0.00	0.00	0.0	0.000
26.033	0.000	0.00	0.00	0.00	0.0	0.000
26.050	0.000	0.00	0.00	0.00	0.0	0.000
26.066	0.000	0.00	0.00	0.00	0.0	0.000
26.083	0.000	0.00	0.00	0.00	0.0	0.000
26.100	0.000	0.00	0.00	0.00	0.0	0.000
26.116	0.000	0.00	0.00	0.00	0.0	0.000
26.133	0.000	0.00	0.00	0.00	0.0	0.000
26.150	0.000	0.00	0.00	0.00	0.0	0.000
26.166	0.000	0.00	0.00	0.00	0.0	0.000
26.183	0.000	0.00	0.00	0.00	0.0	0.000
26.200	0.000	0.00	0.00	0.00	0.0	0.000
26.216	0.000	0.00	0.00	0.00	0.0	0.000
26.233	0.000	0.00	0.00	0.00	0.0	0.000
26.250	0.000	0.00	0.00	0.00	0.0	0.000
26.266	0.000	0.00	0.00	0.00	0.0	0.000
26.283	0.000	0.00	0.00	0.00	0.0	0.000
26.300	0.000	0.00	0.00	0.00	0.0	0.000
26.316	0.000	0.00	0.00	0.00	0.0	0.000
26.333	0.000	0.00	0.00	0.00	0.0	0.000
26.350	0.000	0.00	0.00	0.00	0.0	0.000
26.366	0.000	0.00	0.00	0.00	0.0	0.000
26.383	0.000	0.00	0.00	0.00	0.0	0.000
26.400	0.000	0.00	0.00	0.00	0.0	0.000
26.416	0.000	0.00	0.00	0.00	0.0	0.000
26.433	0.000	0.00	0.00	0.00	0.0	0.000
26.450	0.000	0.00	0.00	0.00	0.0	0.000
26.466	0.000	0.00	0.00	0.00	0.0	0.000
26.483	0.000	0.00	0.00	0.00	0.0	0.000
26.500	0.000	0.00	0.00	0.00	0.0	0.000
26.516	0.000	0.00	0.00	0.00	0.0	0.000
26.533	0.000	0.00	0.00	0.00	0.0	0.000
26.550	0.000	0.00	0.00	0.00	0.0	0.000
26.566	0.000	0.00	0.00	0.00	0.0	0.000
26.583	0.000	0.00	0.00	0.00	0.0	0.000
26.600	0.000	0.00	0.00	0.00	0.0	0.000
26.616	0.000	0.00	0.00	0.00	0.0	0.000
26.633	0.000	0.00	0.00	0.00	0.0	0.000
26.650	0.000	0.00	0.00	0.00	0.0	0.000
26.666	0.000	0.00	0.00	0.00	0.0	0.000
26.683	0.000	0.00	0.00	0.00	0.0	0.000
26.700	0.000	0.00	0.00	0.00	0.0	0.000
26.716	0.000	0.00	0.00	0.00	0.0	0.000
26.733	0.000	0.00	0.00	0.00	0.0	0.000
26.750	0.000	0.00	0.00	0.00	0.0	0.000
26.766	0.000	0.00	0.00	0.00	0.0	0.000
26.783	0.000	0.00	0.00	0.00	0.0	0.000
26.800	0.000	0.00	0.00	0.00	0.0	0.000
26.816	0.000	0.00	0.00	0.00	0.0	0.000
26.833	0.000	0.00	0.00	0.00	0.0	0.000
26.850	0.000	0.00	0.00	0.00	0.0	0.000
26.866	0.000	0.00	0.00	0.00	0.0	0.000
26.883	0.000	0.00	0.00	0.00	0.0	0.000
26.900	0.000	0.00	0.00	0.00	0.0	0.000
26.916	0.000	0.00	0.00	0.00	0.0	0.000
26.933	0.000	0.00	0.00	0.00	0.0	0.000
26.950	0.000	0.00	0.00	0.00	0.0	0.000
26.966	0.000	0.00	0.00	0.00	0.0	0.000
26.983	0.000	0.00	0.00	0.00	0.0	0.000
27.000	0.000	0.00	0.00	0.00	0.0	0.000
27.016	0.000	0.00	0.00	0.00	0.0	0.000
27.033	0.000	0.00	0.00	0.00	0.0	0.000
27.050	0.000	0.00	0.00	0.00	0.0	0.000
27.066	0.000	0.00	0.00	0.00	0.0	0.000
27.083	0.000	0.00	0.00	0.00	0.0	0.000
27.100	0.000	0.00	0.00	0.00	0.0	0.000
27.116	0.000	0.00	0.00	0.00	0.0	0.000
27.133	0.000	0.00	0.00	0.00	0.0	0.000
27.150	0.000	0.00	0.00	0.00	0.0	0.000
27.166	0.000	0.00	0.00	0.00	0.0	0.000
27.183	0.000	0.00	0.00	0.00	0.0	0.000
27.200	0.000	0.00	0.00	0.00	0.0	0.000
27.216	0.000	0.00	0.00	0.00	0.0	0.000
27.233	0.000	0.00	0.00	0.00	0.0	0.000
27.250	0.000	0.00	0.00	0.00	0.0	0.000

27.266	0.000	0.00	0.00	0.00	0.0	0.000
27.283	0.000	0.00	0.00	0.00	0.0	0.000
27.300	0.000	0.00	0.00	0.00	0.0	0.000
27.316	0.000	0.00	0.00	0.00	0.0	0.000
27.333	0.000	0.00	0.00	0.00	0.0	0.000
27.350	0.000	0.00	0.00	0.00	0.0	0.000
27.366	0.000	0.00	0.00	0.00	0.0	0.000
27.383	0.000	0.00	0.00	0.00	0.0	0.000
27.400	0.000	0.00	0.00	0.00	0.0	0.000
27.416	0.000	0.00	0.00	0.00	0.0	0.000
27.433	0.000	0.00	0.00	0.00	0.0	0.000
27.450	0.000	0.00	0.00	0.00	0.0	0.000
27.466	0.000	0.00	0.00	0.00	0.0	0.000
27.483	0.000	0.00	0.00	0.00	0.0	0.000
27.500	0.000	0.00	0.00	0.00	0.0	0.000
27.516	0.000	0.00	0.00	0.00	0.0	0.000
27.533	0.000	0.00	0.00	0.00	0.0	0.000
27.550	0.000	0.00	0.00	0.00	0.0	0.000
27.566	0.000	0.00	0.00	0.00	0.0	0.000
27.583	0.000	0.00	0.00	0.00	0.0	0.000
27.600	0.000	0.00	0.00	0.00	0.0	0.000
27.616	0.000	0.00	0.00	0.00	0.0	0.000
27.633	0.000	0.00	0.00	0.00	0.0	0.000
27.650	0.000	0.00	0.00	0.00	0.0	0.000
27.666	0.000	0.00	0.00	0.00	0.0	0.000
27.683	0.000	0.00	0.00	0.00	0.0	0.000
27.700	0.000	0.00	0.00	0.00	0.0	0.000
27.716	0.000	0.00	0.00	0.00	0.0	0.000
27.733	0.000	0.00	0.00	0.00	0.0	0.000
27.750	0.000	0.00	0.00	0.00	0.0	0.000
27.766	0.000	0.00	0.00	0.00	0.0	0.000
27.783	0.000	0.00	0.00	0.00	0.0	0.000
27.800	0.000	0.00	0.00	0.00	0.0	0.000
27.816	0.000	0.00	0.00	0.00	0.0	0.000
27.833	0.000	0.00	0.00	0.00	0.0	0.000
27.850	0.000	0.00	0.00	0.00	0.0	0.000
27.866	0.000	0.00	0.00	0.00	0.0	0.000
27.883	0.000	0.00	0.00	0.00	0.0	0.000
27.900	0.000	0.00	0.00	0.00	0.0	0.000
27.916	0.000	0.00	0.00	0.00	0.0	0.000
27.933	0.000	0.00	0.00	0.00	0.0	0.000
27.950	0.000	0.00	0.00	0.00	0.0	0.000
27.966	0.000	0.00	0.00	0.00	0.0	0.000
27.983	0.000	0.00	0.00	0.00	0.0	0.000
28.000	0.000	0.00	0.00	0.00	0.0	0.000
28.016	0.000	0.00	0.00	0.00	0.0	0.000
28.033	0.000	0.00	0.00	0.00	0.0	0.000
28.050	0.000	0.00	0.00	0.00	0.0	0.000
28.066	0.000	0.00	0.00	0.00	0.0	0.000
28.083	0.000	0.00	0.00	0.00	0.0	0.000
28.100	0.000	0.00	0.00	0.00	0.0	0.000
28.116	0.000	0.00	0.00	0.00	0.0	0.000
28.133	0.000	0.00	0.00	0.00	0.0	0.000
28.150	0.000	0.00	0.00	0.00	0.0	0.000
28.166	0.000	0.00	0.00	0.00	0.0	0.000
28.183	0.000	0.00	0.00	0.00	0.0	0.000
28.200	0.000	0.00	0.00	0.00	0.0	0.000
28.216	0.000	0.00	0.00	0.00	0.0	0.000
28.233	0.000	0.00	0.00	0.00	0.0	0.000
28.250	0.000	0.00	0.00	0.00	0.0	0.000
28.266	0.000	0.00	0.00	0.00	0.0	0.000
28.283	0.000	0.00	0.00	0.00	0.0	0.000
28.300	0.000	0.00	0.00	0.00	0.0	0.000
28.316	0.000	0.00	0.00	0.00	0.0	0.000
28.333	0.000	0.00	0.00	0.00	0.0	0.000
28.350	0.000	0.00	0.00	0.00	0.0	0.000
28.366	0.000	0.00	0.00	0.00	0.0	0.000
28.383	0.000	0.00	0.00	0.00	0.0	0.000
28.400	0.000	0.00	0.00	0.00	0.0	0.000
28.416	0.000	0.00	0.00	0.00	0.0	0.000
28.433	0.000	0.00	0.00	0.00	0.0	0.000
28.450	0.000	0.00	0.00	0.00	0.0	0.000
28.466	0.000	0.00	0.00	0.00	0.0	0.000
28.483	0.000	0.00	0.00	0.00	0.0	0.000
28.500	0.000	0.00	0.00	0.00	0.0	0.000
28.516	0.000	0.00	0.00	0.00	0.0	0.000
28.533	0.000	0.00	0.00	0.00	0.0	0.000
28.550	0.000	0.00	0.00	0.00	0.0	0.000
28.566	0.000	0.00	0.00	0.00	0.0	0.000

28.583	0.000	0.00	0.00	0.00	0.0	0.000
28.600	0.000	0.00	0.00	0.00	0.0	0.000
28.616	0.000	0.00	0.00	0.00	0.0	0.000
28.633	0.000	0.00	0.00	0.00	0.0	0.000
28.650	0.000	0.00	0.00	0.00	0.0	0.000
28.666	0.000	0.00	0.00	0.00	0.0	0.000
28.683	0.000	0.00	0.00	0.00	0.0	0.000
28.700	0.000	0.00	0.00	0.00	0.0	0.000
28.716	0.000	0.00	0.00	0.00	0.0	0.000
28.733	0.000	0.00	0.00	0.00	0.0	0.000
28.750	0.000	0.00	0.00	0.00	0.0	0.000
28.766	0.000	0.00	0.00	0.00	0.0	0.000
28.783	0.000	0.00	0.00	0.00	0.0	0.000
28.800	0.000	0.00	0.00	0.00	0.0	0.000
28.816	0.000	0.00	0.00	0.00	0.0	0.000
28.833	0.000	0.00	0.00	0.00	0.0	0.000
28.850	0.000	0.00	0.00	0.00	0.0	0.000
28.866	0.000	0.00	0.00	0.00	0.0	0.000
28.883	0.000	0.00	0.00	0.00	0.0	0.000
28.900	0.000	0.00	0.00	0.00	0.0	0.000
28.916	0.000	0.00	0.00	0.00	0.0	0.000
28.933	0.000	0.00	0.00	0.00	0.0	0.000
28.950	0.000	0.00	0.00	0.00	0.0	0.000
28.966	0.000	0.00	0.00	0.00	0.0	0.000
28.983	0.000	0.00	0.00	0.00	0.0	0.000
29.000	0.000	0.00	0.00	0.00	0.0	0.000
29.016	0.000	0.00	0.00	0.00	0.0	0.000
29.033	0.000	0.00	0.00	0.00	0.0	0.000
29.050	0.000	0.00	0.00	0.00	0.0	0.000
29.066	0.000	0.00	0.00	0.00	0.0	0.000
29.083	0.000	0.00	0.00	0.00	0.0	0.000
29.100	0.000	0.00	0.00	0.00	0.0	0.000
29.116	0.000	0.00	0.00	0.00	0.0	0.000
29.133	0.000	0.00	0.00	0.00	0.0	0.000
29.150	0.000	0.00	0.00	0.00	0.0	0.000
29.166	0.000	0.00	0.00	0.00	0.0	0.000
29.183	0.000	0.00	0.00	0.00	0.0	0.000
29.200	0.000	0.00	0.00	0.00	0.0	0.000
29.216	0.000	0.00	0.00	0.00	0.0	0.000
29.233	0.000	0.00	0.00	0.00	0.0	0.000
29.250	0.000	0.00	0.00	0.00	0.0	0.000
29.266	0.000	0.00	0.00	0.00	0.0	0.000
29.283	0.000	0.00	0.00	0.00	0.0	0.000
29.300	0.000	0.00	0.00	0.00	0.0	0.000
29.316	0.000	0.00	0.00	0.00	0.0	0.000
29.333	0.000	0.00	0.00	0.00	0.0	0.000
29.350	0.000	0.00	0.00	0.00	0.0	0.000
29.366	0.000	0.00	0.00	0.00	0.0	0.000
29.383	0.000	0.00	0.00	0.00	0.0	0.000
29.400	0.000	0.00	0.00	0.00	0.0	0.000
29.416	0.000	0.00	0.00	0.00	0.0	0.000
29.433	0.000	0.00	0.00	0.00	0.0	0.000
29.450	0.000	0.00	0.00	0.00	0.0	0.000
29.466	0.000	0.00	0.00	0.00	0.0	0.000
29.483	0.000	0.00	0.00	0.00	0.0	0.000
29.500	0.000	0.00	0.00	0.00	0.0	0.000
29.516	0.000	0.00	0.00	0.00	0.0	0.000
29.533	0.000	0.00	0.00	0.00	0.0	0.000
29.550	0.000	0.00	0.00	0.00	0.0	0.000
29.566	0.000	0.00	0.00	0.00	0.0	0.000
29.583	0.000	0.00	0.00	0.00	0.0	0.000
29.600	0.000	0.00	0.00	0.00	0.0	0.000
29.616	0.000	0.00	0.00	0.00	0.0	0.000
29.633	0.000	0.00	0.00	0.00	0.0	0.000
29.650	0.000	0.00	0.00	0.00	0.0	0.000
29.666	0.000	0.00	0.00	0.00	0.0	0.000
29.683	0.000	0.00	0.00	0.00	0.0	0.000
29.700	0.000	0.00	0.00	0.00	0.0	0.000
29.716	0.000	0.00	0.00	0.00	0.0	0.000
29.733	0.000	0.00	0.00	0.00	0.0	0.000
29.750	0.000	0.00	0.00	0.00	0.0	0.000
29.766	0.000	0.00	0.00	0.00	0.0	0.000
29.783	0.000	0.00	0.00	0.00	0.0	0.000
29.800	0.000	0.00	0.00	0.00	0.0	0.000
29.816	0.000	0.00	0.00	0.00	0.0	0.000
29.833	0.000	0.00	0.00	0.00	0.0	0.000
29.850	0.000	0.00	0.00	0.00	0.0	0.000
29.866	0.000	0.00	0.00	0.00	0.0	0.000
29.883	0.000	0.00	0.00	0.00	0.0	0.000

29.900	0.000	0.00	0.00	0.00	0.0	0.000
29.916	0.000	0.00	0.00	0.00	0.0	0.000
29.933	0.000	0.00	0.00	0.00	0.0	0.000
29.950	0.000	0.00	0.00	0.00	0.0	0.000
29.966	0.000	0.00	0.00	0.00	0.0	0.000
29.983	0.000	0.00	0.00	0.00	0.0	0.000
30.000	0.000	0.00	0.00	0.00	0.0	0.000
30.016	0.000	0.00	0.00	0.00	0.0	0.000
30.033	0.000	0.00	0.00	0.00	0.0	0.000
30.050	0.000	0.00	0.00	0.00	0.0	0.000
30.066	0.000	0.00	0.00	0.00	0.0	0.000
30.083	0.000	0.00	0.00	0.00	0.0	0.000
30.100	0.000	0.00	0.00	0.00	0.0	0.000
30.116	0.000	0.00	0.00	0.00	0.0	0.000
30.133	0.000	0.00	0.00	0.00	0.0	0.000
30.150	0.000	0.00	0.00	0.00	0.0	0.000
30.166	0.000	0.00	0.00	0.00	0.0	0.000
30.183	0.000	0.00	0.00	0.00	0.0	0.000
30.200	0.000	0.00	0.00	0.00	0.0	0.000
30.216	0.000	0.00	0.00	0.00	0.0	0.000
30.233	0.000	0.00	0.00	0.00	0.0	0.000
30.250	0.000	0.00	0.00	0.00	0.0	0.000
30.266	0.000	0.00	0.00	0.00	0.0	0.000
30.283	0.000	0.00	0.00	0.00	0.0	0.000
30.300	0.000	0.00	0.00	0.00	0.0	0.000
30.316	0.000	0.00	0.00	0.00	0.0	0.000
30.333	0.000	0.00	0.00	0.00	0.0	0.000
30.350	0.000	0.00	0.00	0.00	0.0	0.000
30.366	0.000	0.00	0.00	0.00	0.0	0.000
30.383	0.000	0.00	0.00	0.00	0.0	0.000
30.400	0.000	0.00	0.00	0.00	0.0	0.000
30.416	0.000	0.00	0.00	0.00	0.0	0.000
30.433	0.000	0.00	0.00	0.00	0.0	0.000
30.450	0.000	0.00	0.00	0.00	0.0	0.000
30.466	0.000	0.00	0.00	0.00	0.0	0.000
30.483	0.000	0.00	0.00	0.00	0.0	0.000
30.500	0.000	0.00	0.00	0.00	0.0	0.000
30.516	0.000	0.00	0.00	0.00	0.0	0.000
30.533	0.000	0.00	0.00	0.00	0.0	0.000
30.550	0.000	0.00	0.00	0.00	0.0	0.000
30.566	0.000	0.00	0.00	0.00	0.0	0.000
30.583	0.000	0.00	0.00	0.00	0.0	0.000
30.600	0.000	0.00	0.00	0.00	0.0	0.000
30.616	0.000	0.00	0.00	0.00	0.0	0.000
30.633	0.000	0.00	0.00	0.00	0.0	0.000
30.650	0.000	0.00	0.00	0.00	0.0	0.000
30.666	0.000	0.00	0.00	0.00	0.0	0.000
30.683	0.000	0.00	0.00	0.00	0.0	0.000
30.700	0.000	0.00	0.00	0.00	0.0	0.000
30.716	0.000	0.00	0.00	0.00	0.0	0.000
30.733	0.000	0.00	0.00	0.00	0.0	0.000
30.750	0.000	0.00	0.00	0.00	0.0	0.000
30.766	0.000	0.00	0.00	0.00	0.0	0.000
30.783	0.000	0.00	0.00	0.00	0.0	0.000
30.800	0.000	0.00	0.00	0.00	0.0	0.000
30.816	0.000	0.00	0.00	0.00	0.0	0.000
30.833	0.000	0.00	0.00	0.00	0.0	0.000
30.850	0.000	0.00	0.00	0.00	0.0	0.000
30.866	0.000	0.00	0.00	0.00	0.0	0.000
30.883	0.000	0.00	0.00	0.00	0.0	0.000
30.900	0.000	0.00	0.00	0.00	0.0	0.000
30.916	0.000	0.00	0.00	0.00	0.0	0.000
30.933	0.000	0.00	0.00	0.00	0.0	0.000
30.950	0.000	0.00	0.00	0.00	0.0	0.000
30.966	0.000	0.00	0.00	0.00	0.0	0.000
30.983	0.000	0.00	0.00	0.00	0.0	0.000
31.000	0.000	0.00	0.00	0.00	0.0	0.000
31.016	0.000	0.00	0.00	0.00	0.0	0.000
31.033	0.000	0.00	0.00	0.00	0.0	0.000
31.050	0.000	0.00	0.00	0.00	0.0	0.000
31.066	0.000	0.00	0.00	0.00	0.0	0.000
31.083	0.000	0.00	0.00	0.00	0.0	0.000
31.100	0.000	0.00	0.00	0.00	0.0	0.000
31.116	0.000	0.00	0.00	0.00	0.0	0.000
31.133	0.000	0.00	0.00	0.00	0.0	0.000
31.150	0.000	0.00	0.00	0.00	0.0	0.000
31.166	0.000	0.00	0.00	0.00	0.0	0.000
31.183	0.000	0.00	0.00	0.00	0.0	0.000
31.200	0.000	0.00	0.00	0.00	0.0	0.000

31.216	0.000	0.00	0.00	0.00	0.0	0.000
31.233	0.000	0.00	0.00	0.00	0.0	0.000
31.250	0.000	0.00	0.00	0.00	0.0	0.000
31.266	0.000	0.00	0.00	0.00	0.0	0.000
31.283	0.000	0.00	0.00	0.00	0.0	0.000
31.300	0.000	0.00	0.00	0.00	0.0	0.000
31.316	0.000	0.00	0.00	0.00	0.0	0.000
31.333	0.000	0.00	0.00	0.00	0.0	0.000
31.350	0.000	0.00	0.00	0.00	0.0	0.000
31.366	0.000	0.00	0.00	0.00	0.0	0.000
31.383	0.000	0.00	0.00	0.00	0.0	0.000
31.400	0.000	0.00	0.00	0.00	0.0	0.000
31.416	0.000	0.00	0.00	0.00	0.0	0.000
31.433	0.000	0.00	0.00	0.00	0.0	0.000
31.450	0.000	0.00	0.00	0.00	0.0	0.000
31.466	0.000	0.00	0.00	0.00	0.0	0.000
31.483	0.000	0.00	0.00	0.00	0.0	0.000
31.500	0.000	0.00	0.00	0.00	0.0	0.000
31.516	0.000	0.00	0.00	0.00	0.0	0.000
31.533	0.000	0.00	0.00	0.00	0.0	0.000
31.550	0.000	0.00	0.00	0.00	0.0	0.000
31.566	0.000	0.00	0.00	0.00	0.0	0.000
31.583	0.000	0.00	0.00	0.00	0.0	0.000
31.600	0.000	0.00	0.00	0.00	0.0	0.000
31.616	0.000	0.00	0.00	0.00	0.0	0.000
31.633	0.000	0.00	0.00	0.00	0.0	0.000
31.650	0.000	0.00	0.00	0.00	0.0	0.000
31.666	0.000	0.00	0.00	0.00	0.0	0.000
31.683	0.000	0.00	0.00	0.00	0.0	0.000
31.700	0.000	0.00	0.00	0.00	0.0	0.000
31.716	0.000	0.00	0.00	0.00	0.0	0.000
31.733	0.000	0.00	0.00	0.00	0.0	0.000
31.750	0.000	0.00	0.00	0.00	0.0	0.000
31.766	0.000	0.00	0.00	0.00	0.0	0.000
31.783	0.000	0.00	0.00	0.00	0.0	0.000
31.800	0.000	0.00	0.00	0.00	0.0	0.000
31.816	0.000	0.00	0.00	0.00	0.0	0.000
31.833	0.000	0.00	0.00	0.00	0.0	0.000
31.850	0.000	0.00	0.00	0.00	0.0	0.000
31.866	0.000	0.00	0.00	0.00	0.0	0.000
31.883	0.000	0.00	0.00	0.00	0.0	0.000
31.900	0.000	0.00	0.00	0.00	0.0	0.000
31.916	0.000	0.00	0.00	0.00	0.0	0.000
31.933	0.000	0.00	0.00	0.00	0.0	0.000
31.950	0.000	0.00	0.00	0.00	0.0	0.000
31.966	0.000	0.00	0.00	0.00	0.0	0.000
31.983	0.000	0.00	0.00	0.00	0.0	0.000
32.000	0.000	0.00	0.00	0.00	0.0	0.000
32.016	0.000	0.00	0.00	0.00	0.0	0.000
32.033	0.000	0.00	0.00	0.00	0.0	0.000
32.050	0.000	0.00	0.00	0.00	0.0	0.000
32.066	0.000	0.00	0.00	0.00	0.0	0.000
32.083	0.000	0.00	0.00	0.00	0.0	0.000
32.100	0.000	0.00	0.00	0.00	0.0	0.000
32.116	0.000	0.00	0.00	0.00	0.0	0.000
32.133	0.000	0.00	0.00	0.00	0.0	0.000
32.150	0.000	0.00	0.00	0.00	0.0	0.000
32.166	0.000	0.00	0.00	0.00	0.0	0.000
32.183	0.000	0.00	0.00	0.00	0.0	0.000
32.200	0.000	0.00	0.00	0.00	0.0	0.000
32.216	0.000	0.00	0.00	0.00	0.0	0.000
32.233	0.000	0.00	0.00	0.00	0.0	0.000
32.250	0.000	0.00	0.00	0.00	0.0	0.000
32.266	0.000	0.00	0.00	0.00	0.0	0.000
32.283	0.000	0.00	0.00	0.00	0.0	0.000
32.300	0.000	0.00	0.00	0.00	0.0	0.000
32.316	0.000	0.00	0.00	0.00	0.0	0.000
32.333	0.000	0.00	0.00	0.00	0.0	0.000
32.350	0.000	0.00	0.00	0.00	0.0	0.000
32.366	0.000	0.00	0.00	0.00	0.0	0.000
32.383	0.000	0.00	0.00	0.00	0.0	0.000
32.400	0.000	0.00	0.00	0.00	0.0	0.000
32.416	0.000	0.00	0.00	0.00	0.0	0.000
32.433	0.000	0.00	0.00	0.00	0.0	0.000
32.450	0.000	0.00	0.00	0.00	0.0	0.000
32.466	0.000	0.00	0.00	0.00	0.0	0.000
32.483	0.000	0.00	0.00	0.00	0.0	0.000
32.500	0.000	0.00	0.00	0.00	0.0	0.000
32.516	0.000	0.00	0.00	0.00	0.0	0.000

32.533	0.000	0.00	0.00	0.00	0.0	0.000
32.550	0.000	0.00	0.00	0.00	0.0	0.000
32.566	0.000	0.00	0.00	0.00	0.0	0.000
32.583	0.000	0.00	0.00	0.00	0.0	0.000
32.600	0.000	0.00	0.00	0.00	0.0	0.000
32.616	0.000	0.00	0.00	0.00	0.0	0.000
32.633	0.000	0.00	0.00	0.00	0.0	0.000
32.650	0.000	0.00	0.00	0.00	0.0	0.000
32.666	0.000	0.00	0.00	0.00	0.0	0.000
32.683	0.000	0.00	0.00	0.00	0.0	0.000
32.700	0.000	0.00	0.00	0.00	0.0	0.000
32.716	0.000	0.00	0.00	0.00	0.0	0.000
32.733	0.000	0.00	0.00	0.00	0.0	0.000
32.750	0.000	0.00	0.00	0.00	0.0	0.000
32.766	0.000	0.00	0.00	0.00	0.0	0.000
32.783	0.000	0.00	0.00	0.00	0.0	0.000
32.800	0.000	0.00	0.00	0.00	0.0	0.000
32.816	0.000	0.00	0.00	0.00	0.0	0.000
32.833	0.000	0.00	0.00	0.00	0.0	0.000
32.850	0.000	0.00	0.00	0.00	0.0	0.000
32.866	0.000	0.00	0.00	0.00	0.0	0.000
32.883	0.000	0.00	0.00	0.00	0.0	0.000
32.900	0.000	0.00	0.00	0.00	0.0	0.000
32.916	0.000	0.00	0.00	0.00	0.0	0.000
32.933	0.000	0.00	0.00	0.00	0.0	0.000
32.950	0.000	0.00	0.00	0.00	0.0	0.000
32.966	0.000	0.00	0.00	0.00	0.0	0.000
32.983	0.000	0.00	0.00	0.00	0.0	0.000
33.000	0.000	0.00	0.00	0.00	0.0	0.000
33.016	0.000	0.00	0.00	0.00	0.0	0.000
33.033	0.000	0.00	0.00	0.00	0.0	0.000
33.050	0.000	0.00	0.00	0.00	0.0	0.000
33.066	0.000	0.00	0.00	0.00	0.0	0.000
33.083	0.000	0.00	0.00	0.00	0.0	0.000
33.100	0.000	0.00	0.00	0.00	0.0	0.000
33.116	0.000	0.00	0.00	0.00	0.0	0.000
33.133	0.000	0.00	0.00	0.00	0.0	0.000
33.150	0.000	0.00	0.00	0.00	0.0	0.000
33.166	0.000	0.00	0.00	0.00	0.0	0.000
33.183	0.000	0.00	0.00	0.00	0.0	0.000
33.200	0.000	0.00	0.00	0.00	0.0	0.000
33.216	0.000	0.00	0.00	0.00	0.0	0.000
33.233	0.000	0.00	0.00	0.00	0.0	0.000
33.250	0.000	0.00	0.00	0.00	0.0	0.000
33.266	0.000	0.00	0.00	0.00	0.0	0.000
33.283	0.000	0.00	0.00	0.00	0.0	0.000
33.300	0.000	0.00	0.00	0.00	0.0	0.000
33.316	0.000	0.00	0.00	0.00	0.0	0.000
33.333	0.000	0.00	0.00	0.00	0.0	0.000
33.350	0.000	0.00	0.00	0.00	0.0	0.000
33.366	0.000	0.00	0.00	0.00	0.0	0.000
33.383	0.000	0.00	0.00	0.00	0.0	0.000
33.400	0.000	0.00	0.00	0.00	0.0	0.000
33.416	0.000	0.00	0.00	0.00	0.0	0.000
33.433	0.000	0.00	0.00	0.00	0.0	0.000
33.450	0.000	0.00	0.00	0.00	0.0	0.000
33.466	0.000	0.00	0.00	0.00	0.0	0.000
33.483	0.000	0.00	0.00	0.00	0.0	0.000
33.500	0.000	0.00	0.00	0.00	0.0	0.000
33.516	0.000	0.00	0.00	0.00	0.0	0.000
33.533	0.000	0.00	0.00	0.00	0.0	0.000
33.550	0.000	0.00	0.00	0.00	0.0	0.000
33.566	0.000	0.00	0.00	0.00	0.0	0.000
33.583	0.000	0.00	0.00	0.00	0.0	0.000
33.600	0.000	0.00	0.00	0.00	0.0	0.000
33.616	0.000	0.00	0.00	0.00	0.0	0.000
33.633	0.000	0.00	0.00	0.00	0.0	0.000
33.650	0.000	0.00	0.00	0.00	0.0	0.000
33.666	0.000	0.00	0.00	0.00	0.0	0.000
33.683	0.000	0.00	0.00	0.00	0.0	0.000
33.700	0.000	0.00	0.00	0.00	0.0	0.000
33.716	0.000	0.00	0.00	0.00	0.0	0.000
33.733	0.000	0.00	0.00	0.00	0.0	0.000
33.750	0.000	0.00	0.00	0.00	0.0	0.000
33.766	0.000	0.00	0.00	0.00	0.0	0.000
33.783	0.000	0.00	0.00	0.00	0.0	0.000
33.800	0.000	0.00	0.00	0.00	0.0	0.000
33.816	0.000	0.00	0.00	0.00	0.0	0.000
33.833	0.000	0.00	0.00	0.00	0.0	0.000

33.850	0.000	0.00	0.00	0.00	0.0	0.000
33.866	0.000	0.00	0.00	0.00	0.0	0.000
33.883	0.000	0.00	0.00	0.00	0.0	0.000
33.900	0.000	0.00	0.00	0.00	0.0	0.000
33.916	0.000	0.00	0.00	0.00	0.0	0.000
33.933	0.000	0.00	0.00	0.00	0.0	0.000
33.950	0.000	0.00	0.00	0.00	0.0	0.000
33.966	0.000	0.00	0.00	0.00	0.0	0.000
33.983	0.000	0.00	0.00	0.00	0.0	0.000
34.000	0.000	0.00	0.00	0.00	0.0	0.000
34.016	0.000	0.00	0.00	0.00	0.0	0.000
34.033	0.000	0.00	0.00	0.00	0.0	0.000
34.050	0.000	0.00	0.00	0.00	0.0	0.000
34.066	0.000	0.00	0.00	0.00	0.0	0.000
34.083	0.000	0.00	0.00	0.00	0.0	0.000
34.100	0.000	0.00	0.00	0.00	0.0	0.000
34.116	0.000	0.00	0.00	0.00	0.0	0.000
34.133	0.000	0.00	0.00	0.00	0.0	0.000
34.150	0.000	0.00	0.00	0.00	0.0	0.000
34.166	0.000	0.00	0.00	0.00	0.0	0.000
34.183	0.000	0.00	0.00	0.00	0.0	0.000
34.200	0.000	0.00	0.00	0.00	0.0	0.000
34.216	0.000	0.00	0.00	0.00	0.0	0.000
34.233	0.000	0.00	0.00	0.00	0.0	0.000
34.250	0.000	0.00	0.00	0.00	0.0	0.000
34.266	0.000	0.00	0.00	0.00	0.0	0.000
34.283	0.000	0.00	0.00	0.00	0.0	0.000
34.300	0.000	0.00	0.00	0.00	0.0	0.000
34.316	0.000	0.00	0.00	0.00	0.0	0.000
34.333	0.000	0.00	0.00	0.00	0.0	0.000
34.350	0.000	0.00	0.00	0.00	0.0	0.000
34.366	0.000	0.00	0.00	0.00	0.0	0.000
34.383	0.000	0.00	0.00	0.00	0.0	0.000
34.400	0.000	0.00	0.00	0.00	0.0	0.000
34.416	0.000	0.00	0.00	0.00	0.0	0.000
34.433	0.000	0.00	0.00	0.00	0.0	0.000
34.450	0.000	0.00	0.00	0.00	0.0	0.000
34.466	0.000	0.00	0.00	0.00	0.0	0.000
34.483	0.000	0.00	0.00	0.00	0.0	0.000
34.500	0.000	0.00	0.00	0.00	0.0	0.000
34.516	0.000	0.00	0.00	0.00	0.0	0.000
34.533	0.000	0.00	0.00	0.00	0.0	0.000
34.550	0.000	0.00	0.00	0.00	0.0	0.000
34.566	0.000	0.00	0.00	0.00	0.0	0.000
34.583	0.000	0.00	0.00	0.00	0.0	0.000
34.600	0.000	0.00	0.00	0.00	0.0	0.000
34.616	0.000	0.00	0.00	0.00	0.0	0.000
34.633	0.000	0.00	0.00	0.00	0.0	0.000
34.650	0.000	0.00	0.00	0.00	0.0	0.000
34.666	0.000	0.00	0.00	0.00	0.0	0.000
34.683	0.000	0.00	0.00	0.00	0.0	0.000
34.700	0.000	0.00	0.00	0.00	0.0	0.000
34.716	0.000	0.00	0.00	0.00	0.0	0.000
34.733	0.000	0.00	0.00	0.00	0.0	0.000
34.750	0.000	0.00	0.00	0.00	0.0	0.000
34.766	0.000	0.00	0.00	0.00	0.0	0.000
34.783	0.000	0.00	0.00	0.00	0.0	0.000
34.800	0.000	0.00	0.00	0.00	0.0	0.000
34.816	0.000	0.00	0.00	0.00	0.0	0.000
34.833	0.000	0.00	0.00	0.00	0.0	0.000
34.850	0.000	0.00	0.00	0.00	0.0	0.000
34.866	0.000	0.00	0.00	0.00	0.0	0.000
34.883	0.000	0.00	0.00	0.00	0.0	0.000
34.900	0.000	0.00	0.00	0.00	0.0	0.000
34.916	0.000	0.00	0.00	0.00	0.0	0.000
34.933	0.000	0.00	0.00	0.00	0.0	0.000
34.950	0.000	0.00	0.00	0.00	0.0	0.000
34.966	0.000	0.00	0.00	0.00	0.0	0.000
34.983	0.000	0.00	0.00	0.00	0.0	0.000
35.000	0.000	0.00	0.00	0.00	0.0	0.000
35.016	0.000	0.00	0.00	0.00	0.0	0.000
35.033	0.000	0.00	0.00	0.00	0.0	0.000
35.050	0.000	0.00	0.00	0.00	0.0	0.000
35.066	0.000	0.00	0.00	0.00	0.0	0.000
35.083	0.000	0.00	0.00	0.00	0.0	0.000
35.100	0.000	0.00	0.00	0.00	0.0	0.000
35.116	0.000	0.00	0.00	0.00	0.0	0.000
35.133	0.000	0.00	0.00	0.00	0.0	0.000
35.150	0.000	0.00	0.00	0.00	0.0	0.000

35.166	0.000	0.00	0.00	0.00	0.0	0.000
35.183	0.000	0.00	0.00	0.00	0.0	0.000
35.200	0.000	0.00	0.00	0.00	0.0	0.000
35.216	0.000	0.00	0.00	0.00	0.0	0.000
35.233	0.000	0.00	0.00	0.00	0.0	0.000
35.250	0.000	0.00	0.00	0.00	0.0	0.000
35.266	0.000	0.00	0.00	0.00	0.0	0.000
35.283	0.000	0.00	0.00	0.00	0.0	0.000
35.300	0.000	0.00	0.00	0.00	0.0	0.000
35.316	0.000	0.00	0.00	0.00	0.0	0.000
35.333	0.000	0.00	0.00	0.00	0.0	0.000
35.350	0.000	0.00	0.00	0.00	0.0	0.000
35.366	0.000	0.00	0.00	0.00	0.0	0.000
35.383	0.000	0.00	0.00	0.00	0.0	0.000
35.400	0.000	0.00	0.00	0.00	0.0	0.000
35.416	0.000	0.00	0.00	0.00	0.0	0.000
35.433	0.000	0.00	0.00	0.00	0.0	0.000
35.450	0.000	0.00	0.00	0.00	0.0	0.000
35.466	0.000	0.00	0.00	0.00	0.0	0.000
35.483	0.000	0.00	0.00	0.00	0.0	0.000
35.500	0.000	0.00	0.00	0.00	0.0	0.000
35.516	0.000	0.00	0.00	0.00	0.0	0.000
35.533	0.000	0.00	0.00	0.00	0.0	0.000
35.550	0.000	0.00	0.00	0.00	0.0	0.000
35.566	0.000	0.00	0.00	0.00	0.0	0.000
35.583	0.000	0.00	0.00	0.00	0.0	0.000
35.600	0.000	0.00	0.00	0.00	0.0	0.000
35.616	0.000	0.00	0.00	0.00	0.0	0.000
35.633	0.000	0.00	0.00	0.00	0.0	0.000
35.650	0.000	0.00	0.00	0.00	0.0	0.000
35.666	0.000	0.00	0.00	0.00	0.0	0.000
35.683	0.000	0.00	0.00	0.00	0.0	0.000
35.700	0.000	0.00	0.00	0.00	0.0	0.000
35.716	0.000	0.00	0.00	0.00	0.0	0.000
35.733	0.000	0.00	0.00	0.00	0.0	0.000
35.750	0.000	0.00	0.00	0.00	0.0	0.000
35.766	0.000	0.00	0.00	0.00	0.0	0.000
35.783	0.000	0.00	0.00	0.00	0.0	0.000
35.800	0.000	0.00	0.00	0.00	0.0	0.000
35.816	0.000	0.00	0.00	0.00	0.0	0.000
35.833	0.000	0.00	0.00	0.00	0.0	0.000
35.850	0.000	0.00	0.00	0.00	0.0	0.000
35.866	0.000	0.00	0.00	0.00	0.0	0.000
35.883	0.000	0.00	0.00	0.00	0.0	0.000
35.900	0.000	0.00	0.00	0.00	0.0	0.000
35.916	0.000	0.00	0.00	0.00	0.0	0.000
35.933	0.000	0.00	0.00	0.00	0.0	0.000
35.950	0.000	0.00	0.00	0.00	0.0	0.000
35.966	0.000	0.00	0.00	0.00	0.0	0.000
35.983	0.000	0.00	0.00	0.00	0.0	0.000
36.000	0.000	0.00	0.00	0.00	0.0	0.000

PROCESS SUMMARY OF STORAGE:

INFLOW VOLUME = 8.513 AF

BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)

OUTFLOW VOLUME = 8.514 AF

LOSS VOLUME = 0.000 AF

==========

END OF FLOODSCx ROUTING ANALYSIS

Arrow Rt. and Juneberry Dr. - Rancho Cucamonga
Basin Rating Curve

Building 5 - Nodes 220-226 - Line D Sta. 13+21.03

Elevation (ft)	Depth (ft)	Storage (cu-ft)	Storage (ac-ft)	Type SD Orifice C 0.60 Storm Drain Diameter (in) 18 Invert (ft) 1119.10 Discharge (cfs)
1129.19	0.00	0	0.000	27.028
1129.29	0.10	83	0.002	27.161
1129.39	0.20	479	0.011	27.294
1129.49	0.30	1,451	0.033	27.427
1129.59	0.40	3,203	0.074	27.558
1129.69	0.50	5,854	0.134	27.689
1129.79	0.60	9,513	0.218	27.820
1129.89	0.70	14,181	0.326	27.950
1129.99	0.80	19,715	0.453	28.079
1130.09	0.90	26,036	0.598	28.208
1130.19	1.00	33,092	0.760	28.336
1130.29	1.10	40,808	0.937	28.463
1130.39	1.20	49,183	1.129	28.590
1130.49	1.30	58,226	1.337	28.716
1130.59	1.40	67,916	1.559	28.842

```
******************************************************************************

            F L O O D    R O U T I N G    A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* ARROW RT. AND JUNEBERRY DR. - RANCHO CUCAMONGA                         *
* PROPOSED CONDITION - BUILDING 5 - NODES 220-226                        *
* HYDROLOGIC ANALYSIS - 100-YEAR                                         *
 ************************************************************************

  FILE NAME: 4021P2AC.FLD
  TIME/DATE OF STUDY: 10:00 11/09/2023

   The Small Area Unit Hydrograph Procedures in Section J
   of the Hydrology Manual provides estimates of runoff
   hydrograph and runoff volume for watersheds whose time of
   concentration is less than 25 minutes. The PROGRAM User
   should check the applicability of using the small area unit
   hydrograph procedures, and follow the guidelines in
   Sections J and K.5 in complex watershed modeling.


******************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    226.00 IS CODE = 1.2
------------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (SMALL AREA UNIT-HYDROGRAPH ANALYSIS) <<<<<
==============================================================================

  (SMALL AREA UNIT-HYDROGRAPH ADDED TO STREAM #1)

    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   11.30
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.074
    LOW LOSS FRACTION = 0.126
    TIME OF CONCENTRATION(MIN.) =  9.90
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED:
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.51
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  1.05
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.40
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.50
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  8.20

------------------------------------------------------------------------------
    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     6.13
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.59

------------------------------------------------------------------------------
♠
==============================================================================

                      2 4 - H O U R    S T O R M
                   R U N O F F    H Y D R O G R A P H

==============================================================================
              HYDROGRAPH IN  ONE-MINUTE UNIT INTERVALS(CFS)
        (Notes: Time indicated is at END of Each Unit Intervals.
                Peak 5-minute rainfall intensity is modeled as
                a constant value for entire 5-minute period.)
------------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       10.2      20.3      30.5      40.6
------------------------------------------------------------------------------
   0.017      0.0001      0.09  Q         .         .         .         .
   0.033      0.0005      0.27  Q         .         .         .         .
   0.050      0.0011      0.45  Q         .         .         .         .
   0.067      0.0020      0.63  Q         .         .         .         .
```

0.083	0.0031	0.80	Q	.	.	.	.
0.100	0.0044	0.98	Q	.	.	.	.
0.117	0.0060	1.16	VQ	.	.	.	.
0.133	0.0079	1.34	VQ	.	.	.	.
0.150	0.0100	1.52	VQ	.	.	.	.
0.167	0.0123	1.68	VQ	.	.	.	.
0.183	0.0146	1.72	VQ	.	.	.	.
0.200	0.0170	1.72	VQ	.	.	.	.
0.217	0.0194	1.72	VQ	.	.	.	.
0.233	0.0217	1.72	VQ	.	.	.	.
0.250	0.0241	1.72	VQ	.	.	.	.
0.267	0.0265	1.72	VQ	.	.	.	.
0.283	0.0289	1.72	VQ	.	.	.	.
0.300	0.0312	1.72	VQ	.	.	.	.
0.317	0.0336	1.72	VQ	.	.	.	.
0.333	0.0360	1.72	VQ	.	.	.	.
0.350	0.0384	1.72	VQ	.	.	.	.
0.367	0.0407	1.73	VQ	.	.	.	.
0.383	0.0431	1.73	VQ	.	.	.	.
0.400	0.0455	1.73	VQ	.	.	.	.
0.417	0.0479	1.73	VQ	.	.	.	.
0.433	0.0502	1.73	VQ	.	.	.	.
0.450	0.0526	1.73	VQ	.	.	.	.
0.467	0.0550	1.73	VQ	.	.	.	.
0.483	0.0574	1.73	VQ	.	.	.	.
0.500	0.0598	1.73	VQ	.	.	.	.
0.517	0.0622	1.73	VQ	.	.	.	.
0.533	0.0645	1.73	VQ	.	.	.	.
0.550	0.0669	1.73	VQ	.	.	.	.
0.567	0.0693	1.73	VQ	.	.	.	.
0.583	0.0717	1.73	VQ	.	.	.	.
0.600	0.0741	1.74	VQ	.	.	.	.
0.617	0.0765	1.74	VQ	.	.	.	.
0.633	0.0789	1.74	VQ	.	.	.	.
0.650	0.0813	1.74	VQ	.	.	.	.
0.667	0.0837	1.74	VQ	.	.	.	.
0.683	0.0861	1.74	VQ	.	.	.	.
0.700	0.0885	1.74	VQ	.	.	.	.
0.717	0.0909	1.74	VQ	.	.	.	.
0.733	0.0933	1.74	VQ	.	.	.	.
0.750	0.0957	1.74	VQ	.	.	.	.
0.767	0.0981	1.74	VQ	.	.	.	.
0.783	0.1005	1.74	VQ	.	.	.	.
0.800	0.1029	1.74	VQ	.	.	.	.
0.817	0.1053	1.75	VQ	.	.	.	.
0.833	0.1077	1.75	VQ	.	.	.	.
0.850	0.1101	1.75	VQ	.	.	.	.
0.867	0.1125	1.75	VQ	.	.	.	.
0.883	0.1149	1.75	VQ	.	.	.	.
0.900	0.1173	1.75	VQ	.	.	.	.
0.917	0.1197	1.75	VQ	.	.	.	.
0.933	0.1221	1.75	VQ	.	.	.	.
0.950	0.1246	1.75	VQ	.	.	.	.
0.967	0.1270	1.75	VQ	.	.	.	.
0.983	0.1294	1.76	VQ	.	.	.	.
1.000	0.1318	1.76	VQ	.	.	.	.
1.017	0.1342	1.76	VQ	.	.	.	.
1.033	0.1367	1.76	VQ	.	.	.	.
1.050	0.1391	1.76	VQ	.	.	.	.
1.067	0.1415	1.76	VQ	.	.	.	.
1.083	0.1439	1.76	VQ	.	.	.	.
1.100	0.1463	1.76	VQ	.	.	.	.
1.117	0.1488	1.76	VQ	.	.	.	.
1.133	0.1512	1.76	VQ	.	.	.	.
1.150	0.1536	1.76	.Q	.	.	.	.
1.167	0.1561	1.76	.Q	.	.	.	.
1.183	0.1585	1.76	.Q	.	.	.	.
1.200	0.1609	1.76	.Q	.	.	.	.
1.217	0.1633	1.77	.Q	.	.	.	.
1.233	0.1658	1.77	.Q	.	.	.	.
1.250	0.1682	1.77	.Q	.	.	.	.
1.267	0.1707	1.77	.Q	.	.	.	.
1.283	0.1731	1.77	.Q	.	.	.	.
1.300	0.1755	1.77	.Q	.	.	.	.
1.317	0.1780	1.77	.Q	.	.	.	.
1.333	0.1804	1.77	.Q	.	.	.	.
1.350	0.1829	1.77	.Q	.	.	.	.
1.367	0.1853	1.77	.Q	.	.	.	.
1.383	0.1878	1.78	.Q	.	.	.	.

1.400	0.1902	1.78	.Q	.	.	.	.
1.417	0.1926	1.78	.Q	.	.	.	.
1.433	0.1951	1.78	.Q	.	.	.	.
1.450	0.1975	1.78	.Q	.	.	.	.
1.467	0.2000	1.78	.Q	.	.	.	.
1.483	0.2024	1.78	.Q	.	.	.	.
1.500	0.2049	1.78	.Q	.	.	.	.
1.517	0.2073	1.78	.Q	.	.	.	.
1.533	0.2098	1.78	.Q	.	.	.	.
1.550	0.2123	1.78	.Q	.	.	.	.
1.567	0.2147	1.78	.Q	.	.	.	.
1.583	0.2172	1.79	.Q	.	.	.	.
1.600	0.2196	1.79	.Q	.	.	.	.
1.617	0.2221	1.79	.Q	.	.	.	.
1.633	0.2246	1.79	.Q	.	.	.	.
1.650	0.2270	1.79	.Q	.	.	.	.
1.667	0.2295	1.79	.Q	.	.	.	.
1.683	0.2320	1.79	.Q	.	.	.	.
1.700	0.2344	1.79	.Q	.	.	.	.
1.717	0.2369	1.79	.Q	.	.	.	.
1.733	0.2394	1.79	.Q	.	.	.	.
1.750	0.2419	1.79	.Q	.	.	.	.
1.767	0.2443	1.80	.Q	.	.	.	.
1.783	0.2468	1.80	.Q	.	.	.	.
1.800	0.2493	1.80	.Q	.	.	.	.
1.817	0.2517	1.80	.Q	.	.	.	.
1.833	0.2542	1.80	.Q	.	.	.	.
1.850	0.2567	1.80	.Q	.	.	.	.
1.867	0.2592	1.80	.Q	.	.	.	.
1.883	0.2617	1.80	.Q	.	.	.	.
1.900	0.2641	1.80	.Q	.	.	.	.
1.917	0.2666	1.80	.Q	.	.	.	.
1.933	0.2691	1.81	.Q	.	.	.	.
1.950	0.2716	1.81	.Q	.	.	.	.
1.967	0.2741	1.81	.Q	.	.	.	.
1.983	0.2766	1.81	.Q	.	.	.	.
2.000	0.2791	1.81	.Q	.	.	.	.
2.017	0.2816	1.81	.Q	.	.	.	.
2.033	0.2841	1.81	.Q	.	.	.	.
2.050	0.2866	1.81	.Q	.	.	.	.
2.067	0.2891	1.81	.Q	.	.	.	.
2.083	0.2916	1.81	.Q	.	.	.	.
2.100	0.2941	1.81	.Q	.	.	.	.
2.117	0.2966	1.81	.Q	.	.	.	.
2.133	0.2991	1.81	.Q	.	.	.	.
2.150	0.3016	1.82	.Q	.	.	.	.
2.167	0.3041	1.82	.Q	.	.	.	.
2.183	0.3066	1.82	.QV	.	.	.	.
2.200	0.3091	1.82	.QV	.	.	.	.
2.217	0.3116	1.82	.QV	.	.	.	.
2.233	0.3141	1.82	.QV	.	.	.	.
2.250	0.3166	1.82	.QV	.	.	.	.
2.267	0.3191	1.82	.QV	.	.	.	.
2.283	0.3216	1.83	.QV	.	.	.	.
2.300	0.3241	1.83	.QV	.	.	.	.
2.317	0.3267	1.83	.QV	.	.	.	.
2.333	0.3292	1.83	.QV	.	.	.	.
2.350	0.3317	1.83	.QV	.	.	.	.
2.367	0.3342	1.83	.QV	.	.	.	.
2.383	0.3367	1.83	.QV	.	.	.	.
2.400	0.3393	1.83	.QV	.	.	.	.
2.417	0.3418	1.83	.QV	.	.	.	.
2.433	0.3443	1.83	.QV	.	.	.	.
2.450	0.3468	1.83	.QV	.	.	.	.
2.467	0.3494	1.83	.QV	.	.	.	.
2.483	0.3519	1.83	.QV	.	.	.	.
2.500	0.3544	1.84	.QV	.	.	.	.
2.517	0.3569	1.84	.QV	.	.	.	.
2.533	0.3595	1.84	.QV	.	.	.	.
2.550	0.3620	1.84	.QV	.	.	.	.
2.567	0.3645	1.84	.QV	.	.	.	.
2.583	0.3671	1.84	.QV	.	.	.	.
2.600	0.3696	1.84	.QV	.	.	.	.
2.617	0.3722	1.85	.QV	.	.	.	.
2.633	0.3747	1.85	.QV	.	.	.	.
2.650	0.3772	1.85	.QV	.	.	.	.
2.667	0.3798	1.85	.QV	.	.	.	.
2.683	0.3823	1.85	.QV	.	.	.	.
2.700	0.3849	1.85	.QV	.	.	.	.

2.717	0.3874	1.85	.QV	.	.	.	.
2.733	0.3900	1.85	.QV	.	.	.	.
2.750	0.3925	1.85	.QV	.	.	.	.
2.767	0.3951	1.85	.QV	.	.	.	.
2.783	0.3976	1.85	.QV	.	.	.	.
2.800	0.4002	1.85	.QV	.	.	.	.
2.817	0.4027	1.85	.QV	.	.	.	.
2.833	0.4053	1.86	.QV	.	.	.	.
2.850	0.4079	1.86	.QV	.	.	.	.
2.867	0.4104	1.86	.QV	.	.	.	.
2.883	0.4130	1.86	.QV	.	.	.	.
2.900	0.4155	1.86	.QV	.	.	.	.
2.917	0.4181	1.86	.QV	.	.	.	.
2.933	0.4207	1.86	.QV	.	.	.	.
2.950	0.4232	1.87	.QV	.	.	.	.
2.967	0.4258	1.87	.QV	.	.	.	.
2.983	0.4284	1.87	.QV	.	.	.	.
3.000	0.4310	1.87	.QV	.	.	.	.
3.017	0.4335	1.87	.QV	.	.	.	.
3.033	0.4361	1.87	.QV	.	.	.	.
3.050	0.4387	1.87	.QV	.	.	.	.
3.067	0.4413	1.87	.QV	.	.	.	.
3.083	0.4438	1.87	.QV	.	.	.	.
3.100	0.4464	1.87	.QV	.	.	.	.
3.117	0.4490	1.87	.QV	.	.	.	.
3.133	0.4516	1.87	.QV	.	.	.	.
3.150	0.4542	1.88	.QV	.	.	.	.
3.167	0.4568	1.88	.QV	.	.	.	.
3.183	0.4593	1.88	.QV	.	.	.	.
3.200	0.4619	1.88	.Q V	.	.	.	.
3.217	0.4645	1.88	.Q V	.	.	.	.
3.233	0.4671	1.88	.Q V	.	.	.	.
3.250	0.4697	1.88	.Q V	.	.	.	.
3.267	0.4723	1.88	.Q V	.	.	.	.
3.283	0.4749	1.89	.Q V	.	.	.	.
3.300	0.4775	1.89	.Q V	.	.	.	.
3.317	0.4801	1.89	.Q V	.	.	.	.
3.333	0.4827	1.89	.Q V	.	.	.	.
3.350	0.4853	1.89	.Q V	.	.	.	.
3.367	0.4879	1.89	.Q V	.	.	.	.
3.383	0.4905	1.89	.Q V	.	.	.	.
3.400	0.4931	1.89	.Q V	.	.	.	.
3.417	0.4957	1.89	.Q V	.	.	.	.
3.433	0.4983	1.89	.Q V	.	.	.	.
3.450	0.5009	1.89	.Q V	.	.	.	.
3.467	0.5036	1.90	.Q V	.	.	.	.
3.483	0.5062	1.90	.Q V	.	.	.	.
3.500	0.5088	1.90	.Q V	.	.	.	.
3.517	0.5114	1.90	.Q V	.	.	.	.
3.533	0.5140	1.90	.Q V	.	.	.	.
3.550	0.5166	1.90	.Q V	.	.	.	.
3.567	0.5193	1.90	.Q V	.	.	.	.
3.583	0.5219	1.91	.Q V	.	.	.	.
3.600	0.5245	1.91	.Q V	.	.	.	.
3.617	0.5271	1.91	.Q V	.	.	.	.
3.633	0.5298	1.91	.Q V	.	.	.	.
3.650	0.5324	1.91	.Q V	.	.	.	.
3.667	0.5350	1.91	.Q V	.	.	.	.
3.683	0.5377	1.91	.Q V	.	.	.	.
3.700	0.5403	1.91	.Q V	.	.	.	.
3.717	0.5429	1.91	.Q V	.	.	.	.
3.733	0.5456	1.91	.Q V	.	.	.	.
3.750	0.5482	1.91	.Q V	.	.	.	.
3.767	0.5508	1.92	.Q V	.	.	.	.
3.783	0.5535	1.92	.Q V	.	.	.	.
3.800	0.5561	1.92	.Q V	.	.	.	.
3.817	0.5588	1.92	.Q V	.	.	.	.
3.833	0.5614	1.92	.Q V	.	.	.	.
3.850	0.5641	1.92	.Q V	.	.	.	.
3.867	0.5667	1.92	.Q V	.	.	.	.
3.883	0.5694	1.92	.Q V	.	.	.	.
3.900	0.5720	1.93	.Q V	.	.	.	.
3.917	0.5747	1.93	.Q V	.	.	.	.
3.933	0.5773	1.93	.Q V	.	.	.	.
3.950	0.5800	1.93	.Q V	.	.	.	.
3.967	0.5826	1.93	.Q V	.	.	.	.
3.983	0.5853	1.93	.Q V	.	.	.	.
4.000	0.5880	1.93	.Q V	.	.	.	.
4.017	0.5906	1.93	.Q V	.	.	.	.

4.033	0.5933	1.94	.Q V	.	.	.	.
4.050	0.5960	1.94	.Q V	.	.	.	.
4.067	0.5986	1.94	.Q V	.	.	.	.
4.083	0.6013	1.94	.Q V	.	.	.	.
4.100	0.6040	1.94	.Q V	.	.	.	.
4.117	0.6066	1.94	.Q V	.	.	.	.
4.133	0.6093	1.94	.Q V	.	.	.	.
4.150	0.6120	1.94	.Q V	.	.	.	.
4.167	0.6147	1.94	.Q V	.	.	.	.
4.183	0.6173	1.94	.Q V	.	.	.	.
4.200	0.6200	1.95	.Q V	.	.	.	.
4.217	0.6227	1.95	.Q V	.	.	.	.
4.233	0.6254	1.95	.Q V	.	.	.	.
4.250	0.6281	1.95	.Q V	.	.	.	.
4.267	0.6308	1.95	.Q V	.	.	.	.
4.283	0.6335	1.95	.Q V	.	.	.	.
4.300	0.6362	1.96	.Q V	.	.	.	.
4.317	0.6389	1.96	.Q V	.	.	.	.
4.333	0.6416	1.96	.Q V	.	.	.	.
4.350	0.6442	1.96	.Q V	.	.	.	.
4.367	0.6469	1.96	.Q V	.	.	.	.
4.383	0.6496	1.96	.Q V	.	.	.	.
4.400	0.6523	1.96	.Q V	.	.	.	.
4.417	0.6550	1.96	.Q V	.	.	.	.
4.433	0.6577	1.96	.Q V	.	.	.	.
4.450	0.6605	1.96	.Q V	.	.	.	.
4.467	0.6632	1.96	.Q V	.	.	.	.
4.483	0.6659	1.97	.Q V	.	.	.	.
4.500	0.6686	1.97	.Q V	.	.	.	.
4.517	0.6713	1.97	.Q V	.	.	.	.
4.533	0.6740	1.97	.Q V	.	.	.	.
4.550	0.6767	1.97	.Q V	.	.	.	.
4.567	0.6794	1.97	.Q V	.	.	.	.
4.583	0.6822	1.98	.Q V	.	.	.	.
4.600	0.6849	1.98	.Q V	.	.	.	.
4.617	0.6876	1.98	.Q V	.	.	.	.
4.633	0.6903	1.98	.Q V	.	.	.	.
4.650	0.6931	1.98	.Q V	.	.	.	.
4.667	0.6958	1.98	.Q V	.	.	.	.
4.683	0.6985	1.98	.Q V	.	.	.	.
4.700	0.7013	1.98	.Q V	.	.	.	.
4.717	0.7040	1.98	.Q V	.	.	.	.
4.733	0.7067	1.99	.Q V	.	.	.	.
4.750	0.7095	1.99	.Q V	.	.	.	.
4.767	0.7122	1.99	.Q V	.	.	.	.
4.783	0.7149	1.99	.Q V	.	.	.	.
4.800	0.7177	1.99	.Q V	.	.	.	.
4.817	0.7204	1.99	.Q V	.	.	.	.
4.833	0.7232	1.99	.Q V	.	.	.	.
4.850	0.7259	1.99	.Q V	.	.	.	.
4.867	0.7287	2.00	.Q V	.	.	.	.
4.883	0.7314	2.00	.Q V	.	.	.	.
4.900	0.7342	2.00	.Q V	.	.	.	.
4.917	0.7369	2.00	.Q V	.	.	.	.
4.933	0.7397	2.00	.Q V	.	.	.	.
4.950	0.7424	2.00	.Q V	.	.	.	.
4.967	0.7452	2.01	.Q V	.	.	.	.
4.983	0.7480	2.01	.Q V	.	.	.	.
5.000	0.7507	2.01	.Q V	.	.	.	.
5.017	0.7535	2.01	.Q V	.	.	.	.
5.033	0.7563	2.01	.Q V	.	.	.	.
5.050	0.7590	2.01	.Q V	.	.	.	.
5.067	0.7618	2.01	.Q V	.	.	.	.
5.083	0.7646	2.01	.Q V	.	.	.	.
5.100	0.7673	2.01	.Q V	.	.	.	.
5.117	0.7701	2.01	.Q V	.	.	.	.
5.133	0.7729	2.02	.Q V	.	.	.	.
5.150	0.7757	2.02	.Q V	.	.	.	.
5.167	0.7784	2.02	.Q V	.	.	.	.
5.183	0.7812	2.02	.Q V	.	.	.	.
5.200	0.7840	2.02	.Q V	.	.	.	.
5.217	0.7868	2.02	.Q V	.	.	.	.
5.233	0.7896	2.03	.Q V	.	.	.	.
5.250	0.7924	2.03	.Q V	.	.	.	.
5.267	0.7952	2.03	.Q V	.	.	.	.
5.283	0.7980	2.03	.Q V	.	.	.	.
5.300	0.8008	2.03	.Q V	.	.	.	.
5.317	0.8036	2.03	. Q V	.	.	.	.
5.333	0.8064	2.03	. Q V	.	.	.	.

5.350	0.8092	2.03	.	Q	V	.	.	.	.
5.367	0.8120	2.04	.	Q	V	.	.	.	.
5.383	0.8148	2.04	.	Q	V	.	.	.	.
5.400	0.8176	2.04	.	Q	V	.	.	.	.
5.417	0.8204	2.04	.	Q	V	.	.	.	.
5.433	0.8232	2.04	.	Q	V	.	.	.	.
5.450	0.8260	2.04	.	Q	V	.	.	.	.
5.467	0.8288	2.04	.	Q	V	.	.	.	.
5.483	0.8317	2.04	.	Q	V	.	.	.	.
5.500	0.8345	2.05	.	Q	V	.	.	.	.
5.517	0.8373	2.05	.	Q	V	.	.	.	.
5.533	0.8401	2.05	.	Q	V	.	.	.	.
5.550	0.8429	2.05	.	Q	V	.	.	.	.
5.567	0.8458	2.05	.	Q	V	.	.	.	.
5.583	0.8486	2.06	.	Q	V	.	.	.	.
5.600	0.8514	2.06	.	Q	V	.	.	.	.
5.617	0.8543	2.06	.	Q	V	.	.	.	.
5.633	0.8571	2.06	.	Q	V	.	.	.	.
5.650	0.8600	2.06	.	Q	V	.	.	.	.
5.667	0.8628	2.06	.	Q	V	.	.	.	.
5.683	0.8656	2.06	.	Q	V	.	.	.	.
5.700	0.8685	2.06	.	Q	V	.	.	.	.
5.717	0.8713	2.06	.	Q	V	.	.	.	.
5.733	0.8742	2.07	.	Q	V	.	.	.	.
5.750	0.8770	2.07	.	Q	V	.	.	.	.
5.767	0.8799	2.07	.	Q	V	.	.	.	.
5.783	0.8827	2.07	.	Q	V	.	.	.	.
5.800	0.8856	2.07	.	Q	V	.	.	.	.
5.817	0.8884	2.07	.	Q	V	.	.	.	.
5.833	0.8913	2.07	.	Q	V	.	.	.	.
5.850	0.8941	2.08	.	Q	V	.	.	.	.
5.867	0.8970	2.08	.	Q	V	.	.	.	.
5.883	0.8999	2.08	.	Q	V	.	.	.	.
5.900	0.9027	2.08	.	Q	V	.	.	.	.
5.917	0.9056	2.08	.	Q	V	.	.	.	.
5.933	0.9085	2.09	.	Q	V	.	.	.	.
5.950	0.9114	2.09	.	Q	V	.	.	.	.
5.967	0.9142	2.09	.	Q	V	.	.	.	.
5.983	0.9171	2.09	.	Q	V	.	.	.	.
6.000	0.9200	2.09	.	Q	V	.	.	.	.
6.017	0.9229	2.09	.	Q	V	.	.	.	.
6.033	0.9258	2.09	.	Q	V	.	.	.	.
6.050	0.9286	2.09	.	Q	V	.	.	.	.
6.067	0.9315	2.09	.	Q	V	.	.	.	.
6.083	0.9344	2.10	.	Q	V	.	.	.	.
6.100	0.9373	2.10	.	Q	V	.	.	.	.
6.117	0.9402	2.10	.	Q	V	.	.	.	.
6.133	0.9431	2.10	.	Q	V	.	.	.	.
6.150	0.9460	2.10	.	Q	V	.	.	.	.
6.167	0.9489	2.10	.	Q	V	.	.	.	.
6.183	0.9518	2.11	.	Q	V	.	.	.	.
6.200	0.9547	2.11	.	Q	V	.	.	.	.
6.217	0.9576	2.11	.	Q	V	.	.	.	.
6.233	0.9605	2.11	.	Q	V	.	.	.	.
6.250	0.9634	2.11	.	Q	V	.	.	.	.
6.267	0.9663	2.12	.	Q	V	.	.	.	.
6.283	0.9692	2.12	.	Q	V	.	.	.	.
6.300	0.9722	2.12	.	Q	V	.	.	.	.
6.317	0.9751	2.12	.	Q	V	.	.	.	.
6.333	0.9780	2.12	.	Q	V	.	.	.	.
6.350	0.9809	2.12	.	Q	V	.	.	.	.
6.367	0.9839	2.12	.	Q	V	.	.	.	.
6.383	0.9868	2.12	.	Q	V	.	.	.	.
6.400	0.9897	2.13	.	Q	V	.	.	.	.
6.417	0.9926	2.13	.	Q	V	.	.	.	.
6.433	0.9956	2.13	.	Q	V	.	.	.	.
6.450	0.9985	2.13	.	Q	V	.	.	.	.
6.467	1.0014	2.13	.	Q	V	.	.	.	.
6.483	1.0044	2.13	.	Q	V	.	.	.	.
6.500	1.0073	2.14	.	Q	V	.	.	.	.
6.517	1.0103	2.14	.	Q	V	.	.	.	.
6.533	1.0132	2.14	.	Q	V	.	.	.	.
6.550	1.0162	2.14	.	Q	V	.	.	.	.
6.567	1.0191	2.14	.	Q	V	.	.	.	.
6.583	1.0221	2.15	.	Q	V	.	.	.	.
6.600	1.0250	2.15	.	Q	V	.	.	.	.
6.617	1.0280	2.15	.	Q	V	.	.	.	.
6.633	1.0310	2.15	.	Q	V	.	.	.	.
6.650	1.0339	2.15	.	Q	V	.	.	.	.

6.667	1.0369	2.15	.	Q	V	.	.	.	.
6.683	1.0399	2.15	.	Q	V	.	.	.	.
6.700	1.0428	2.16	.	Q	V	.	.	.	.
6.717	1.0458	2.16	.	Q	V	.	.	.	.
6.733	1.0488	2.16	.	Q	V	.	.	.	.
6.750	1.0518	2.16	.	Q	V	.	.	.	.
6.767	1.0547	2.16	.	Q	V	.	.	.	.
6.783	1.0577	2.16	.	Q	V	.	.	.	.
6.800	1.0607	2.16	.	Q	V	.	.	.	.
6.817	1.0637	2.17	.	Q	V	.	.	.	.
6.833	1.0667	2.17	.	Q	V	.	.	.	.
6.850	1.0697	2.17	.	Q	V	.	.	.	.
6.867	1.0726	2.17	.	Q	V	.	.	.	.
6.883	1.0756	2.18	.	Q	V	.	.	.	.
6.900	1.0786	2.18	.	Q	V	.	.	.	.
6.917	1.0816	2.18	.	Q	V	.	.	.	.
6.933	1.0847	2.18	.	Q	V	.	.	.	.
6.950	1.0877	2.18	.	Q	V	.	.	.	.
6.967	1.0907	2.19	.	Q	V	.	.	.	.
6.983	1.0937	2.19	.	Q	V	.	.	.	.
7.000	1.0967	2.19	.	Q	V	.	.	.	.
7.017	1.0997	2.19	.	Q	V	.	.	.	.
7.033	1.1027	2.19	.	Q	V	.	.	.	.
7.050	1.1057	2.19	.	Q	V	.	.	.	.
7.067	1.1088	2.19	.	Q	V	.	.	.	.
7.083	1.1118	2.19	.	Q	V	.	.	.	.
7.100	1.1148	2.19	.	Q	V	.	.	.	.
7.117	1.1178	2.20	.	Q	V	.	.	.	.
7.133	1.1209	2.20	.	Q	V	.	.	.	.
7.150	1.1239	2.20	.	Q	V	.	.	.	.
7.167	1.1269	2.20	.	Q	V	.	.	.	.
7.183	1.1300	2.21	.	Q	V	.	.	.	.
7.200	1.1330	2.21	.	Q	V	.	.	.	.
7.217	1.1361	2.21	.	Q	V	.	.	.	.
7.233	1.1391	2.21	.	Q	V	.	.	.	.
7.250	1.1422	2.22	.	Q	V	.	.	.	.
7.267	1.1452	2.22	.	Q	V	.	.	.	.
7.283	1.1483	2.22	.	Q	V	.	.	.	.
7.300	1.1513	2.22	.	Q	V	.	.	.	.
7.317	1.1544	2.22	.	Q	V	.	.	.	.
7.333	1.1575	2.22	.	Q	V	.	.	.	.
7.350	1.1605	2.22	.	Q	V	.	.	.	.
7.367	1.1636	2.23	.	Q	V	.	.	.	.
7.383	1.1666	2.23	.	Q	V	.	.	.	.
7.400	1.1697	2.23	.	Q	V	.	.	.	.
7.417	1.1728	2.23	.	Q	V	.	.	.	.
7.433	1.1759	2.23	.	Q	V	.	.	.	.
7.450	1.1789	2.23	.	Q	V	.	.	.	.
7.467	1.1820	2.24	.	Q	V	.	.	.	.
7.483	1.1851	2.24	.	Q	V	.	.	.	.
7.500	1.1882	2.24	.	Q	V	.	.	.	.
7.517	1.1913	2.24	.	Q	V	.	.	.	.
7.533	1.1944	2.25	.	Q	V	.	.	.	.
7.550	1.1975	2.25	.	Q	V	.	.	.	.
7.567	1.2006	2.25	.	Q	V	.	.	.	.
7.583	1.2037	2.25	.	Q	V	.	.	.	.
7.600	1.2068	2.26	.	Q	V	.	.	.	.
7.617	1.2099	2.26	.	Q	V	.	.	.	.
7.633	1.2130	2.26	.	Q	V	.	.	.	.
7.650	1.2161	2.26	.	Q	V	.	.	.	.
7.667	1.2192	2.26	.	Q	V	.	.	.	.
7.683	1.2223	2.26	.	Q	V	.	.	.	.
7.700	1.2255	2.26	.	Q	V	.	.	.	.
7.717	1.2286	2.26	.	Q	V	.	.	.	.
7.733	1.2317	2.27	.	Q	V	.	.	.	.
7.750	1.2348	2.27	.	Q	V	.	.	.	.
7.767	1.2379	2.27	.	Q	V	.	.	.	.
7.783	1.2411	2.27	.	Q	V	.	.	.	.
7.800	1.2442	2.27	.	Q	V	.	.	.	.
7.817	1.2473	2.28	.	Q	V	.	.	.	.
7.833	1.2505	2.28	.	Q	V	.	.	.	.
7.850	1.2536	2.28	.	Q	V	.	.	.	.
7.867	1.2568	2.28	.	Q	V	.	.	.	.
7.883	1.2599	2.29	.	Q	V	.	.	.	.
7.900	1.2631	2.29	.	Q	V	.	.	.	.
7.917	1.2662	2.29	.	Q	V	.	.	.	.
7.933	1.2694	2.29	.	Q	V	.	.	.	.
7.950	1.2726	2.30	.	Q	V	.	.	.	.
7.967	1.2757	2.30	.	Q	V	.	.	.	.

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7.983     1.2789     2.30  . Q    V .        .        .        .
8.000     1.2821     2.30  . Q    V .        .        .        .
8.017     1.2852     2.30  . Q    V .        .        .        .
8.033     1.2884     2.30  . Q    V .        .        .        .
8.050     1.2916     2.30  . Q    V .        .        .        .
8.067     1.2947     2.31  . Q    V .        .        .        .
8.083     1.2979     2.31  . Q    V .        .        .        .
8.100     1.3011     2.31  . Q    V .        .        .        .
8.117     1.3043     2.31  . Q    V .        .        .        .
8.133     1.3075     2.32  . Q    V .        .        .        .
8.150     1.3107     2.32  . Q    V .        .        .        .
8.167     1.3139     2.32  . Q    V .        .        .        .
8.183     1.3171     2.32  . Q    V .        .        .        .
8.200     1.3203     2.33  . Q    V .        .        .        .
8.217     1.3235     2.33  . Q    V .        .        .        .
8.233     1.3267     2.33  . Q    V .        .        .        .
8.250     1.3299     2.33  . Q    V .        .        .        .
8.267     1.3331     2.34  . Q    V .        .        .        .
8.283     1.3364     2.34  . Q    V .        .        .        .
8.300     1.3396     2.34  . Q    V .        .        .        .
8.317     1.3428     2.34  . Q    V .        .        .        .
8.333     1.3460     2.34  . Q    V .        .        .        .
8.350     1.3493     2.34  . Q    V .        .        .        .
8.367     1.3525     2.35  . Q    V .        .        .        .
8.383     1.3557     2.35  . Q    V .        .        .        .
8.400     1.3589     2.35  . Q    V .        .        .        .
8.417     1.3622     2.35  . Q    V .        .        .        .
8.433     1.3654     2.35  . Q    V .        .        .        .
8.450     1.3687     2.36  . Q    V .        .        .        .
8.467     1.3719     2.36  . Q    V .        .        .        .
8.483     1.3752     2.36  . Q    V .        .        .        .
8.500     1.3784     2.36  . Q    V .        .        .        .
8.517     1.3817     2.37  . Q     V.        .        .        .
8.533     1.3850     2.37  . Q     V.        .        .        .
8.550     1.3882     2.37  . Q     V.        .        .        .
8.567     1.3915     2.38  . Q     V.        .        .        .
8.583     1.3948     2.38  . Q     V.        .        .        .
8.600     1.3981     2.38  . Q     V.        .        .        .
8.617     1.4013     2.38  . Q     V.        .        .        .
8.633     1.4046     2.38  . Q     V.        .        .        .
8.650     1.4079     2.39  . Q     V.        .        .        .
8.667     1.4112     2.39  . Q     V.        .        .        .
8.683     1.4145     2.39  . Q     V.        .        .        .
8.700     1.4178     2.39  . Q     V.        .        .        .
8.717     1.4211     2.39  . Q     V.        .        .        .
8.733     1.4244     2.39  . Q     V.        .        .        .
8.750     1.4277     2.40  . Q     V.        .        .        .
8.767     1.4310     2.40  . Q     V.        .        .        .
8.783     1.4343     2.40  . Q     V.        .        .        .
8.800     1.4376     2.40  . Q     V.        .        .        .
8.817     1.4409     2.41  . Q     V.        .        .        .
8.833     1.4442     2.41  . Q     V.        .        .        .
8.850     1.4475     2.41  . Q     V.        .        .        .
8.867     1.4509     2.42  . Q     V.        .        .        .
8.883     1.4542     2.42  . Q     V.        .        .        .
8.900     1.4576     2.42  . Q     V.        .        .        .
8.917     1.4609     2.43  . Q     V.        .        .        .
8.933     1.4642     2.43  . Q     V.        .        .        .
8.950     1.4676     2.43  . Q     V.        .        .        .
8.967     1.4709     2.43  . Q     V.        .        .        .
8.983     1.4743     2.43  . Q     V.        .        .        .
9.000     1.4776     2.43  . Q     V.        .        .        .
9.017     1.4810     2.44  . Q     V.        .        .        .
9.033     1.4844     2.44  . Q     V.        .        .        .
9.050     1.4877     2.44  . Q     V.        .        .        .
9.067     1.4911     2.44  . Q     V.        .        .        .
9.083     1.4944     2.44  . Q     V.        .        .        .
9.100     1.4978     2.45  . Q     V.        .        .        .
9.117     1.5012     2.45  . Q     V.        .        .        .
9.133     1.5046     2.45  . Q     V.        .        .        .
9.150     1.5080     2.46  . Q     V.        .        .        .
9.167     1.5113     2.46  . Q     V.        .        .        .
9.183     1.5147     2.46  . Q     V.        .        .        .
9.200     1.5181     2.47  . Q     V.        .        .        .
9.217     1.5215     2.47  . Q     V.        .        .        .
9.233     1.5249     2.47  . Q     V.        .        .        .
9.250     1.5284     2.48  . Q     V.        .        .        .
9.267     1.5318     2.48  . Q     V.        .        .        .
9.283     1.5352     2.48  . Q      V        .        .        .
```

9.300	1.5386	2.48	.	Q	V	.	.	.
9.317	1.5420	2.48	.	Q	V	.	.	.
9.333	1.5455	2.49	.	Q	V	.	.	.
9.350	1.5489	2.49	.	Q	V	.	.	.
9.367	1.5523	2.49	.	Q	V	.	.	.
9.383	1.5557	2.49	.	Q	V	.	.	.
9.400	1.5592	2.49	.	Q	V	.	.	.
9.417	1.5626	2.50	.	Q	V	.	.	.
9.433	1.5661	2.50	.	Q	V	.	.	.
9.450	1.5695	2.50	.	Q	V	.	.	.
9.467	1.5730	2.51	.	Q	V	.	.	.
9.483	1.5764	2.51	.	Q	V	.	.	.
9.500	1.5799	2.51	.	Q	V	.	.	.
9.517	1.5833	2.52	.	Q	V	.	.	.
9.533	1.5868	2.52	.	Q	V	.	.	.
9.550	1.5903	2.52	.	Q	V	.	.	.
9.567	1.5938	2.53	.	Q	V	.	.	.
9.583	1.5973	2.53	.	Q	V	.	.	.
9.600	1.6008	2.53	.	Q	V	.	.	.
9.617	1.6042	2.53	.	Q	V	.	.	.
9.633	1.6077	2.54	.	Q	V	.	.	.
9.650	1.6112	2.54	.	Q	V	.	.	.
9.667	1.6147	2.54	.	Q	V	.	.	.
9.683	1.6182	2.54	.	Q	V	.	.	.
9.700	1.6217	2.54	.	Q	V	.	.	.
9.717	1.6252	2.55	.	Q	V	.	.	.
9.733	1.6288	2.55	.	Q	V	.	.	.
9.750	1.6323	2.55	.	Q	V	.	.	.
9.767	1.6358	2.56	.	Q	V	.	.	.
9.783	1.6393	2.56	.	Q	V	.	.	.
9.800	1.6429	2.56	.	Q	V	.	.	.
9.817	1.6464	2.57	.	Q	V	.	.	.
9.833	1.6499	2.57	.	Q	V	.	.	.
9.850	1.6535	2.58	.	Q	V	.	.	.
9.867	1.6570	2.58	.	Q	V	.	.	.
9.883	1.6606	2.58	.	Q	V	.	.	.
9.900	1.6641	2.59	.	Q	V	.	.	.
9.917	1.6677	2.59	.	Q	V	.	.	.
9.933	1.6713	2.59	.	Q	V	.	.	.
9.950	1.6749	2.59	.	Q	V	.	.	.
9.967	1.6784	2.60	.	Q	V	.	.	.
9.983	1.6820	2.60	.	Q	V	.	.	.
10.000	1.6856	2.60	.	Q	.V	.	.	.
10.017	1.6892	2.60	.	Q	.V	.	.	.
10.033	1.6928	2.60	.	Q	.V	.	.	.
10.050	1.6963	2.61	.	Q	.V	.	.	.
10.067	1.6999	2.61	.	Q	.V	.	.	.
10.083	1.7035	2.61	.	Q	.V	.	.	.
10.100	1.7071	2.62	.	Q	.V	.	.	.
10.117	1.7107	2.62	.	Q	.V	.	.	.
10.133	1.7144	2.62	.	Q	.V	.	.	.
10.150	1.7180	2.63	.	Q	.V	.	.	.
10.167	1.7216	2.63	.	Q	.V	.	.	.
10.183	1.7252	2.64	.	Q	.V	.	.	.
10.200	1.7289	2.64	.	Q	.V	.	.	.
10.217	1.7325	2.65	.	Q	.V	.	.	.
10.233	1.7362	2.65	.	Q	.V	.	.	.
10.250	1.7398	2.65	.	Q	.V	.	.	.
10.267	1.7435	2.65	.	Q	.V	.	.	.
10.283	1.7471	2.66	.	Q	.V	.	.	.
10.300	1.7508	2.66	.	Q	.V	.	.	.
10.317	1.7545	2.66	.	Q	.V	.	.	.
10.333	1.7581	2.66	.	Q	.V	.	.	.
10.350	1.7618	2.67	.	Q	.V	.	.	.
10.367	1.7655	2.67	.	Q	.V	.	.	.
10.383	1.7692	2.67	.	Q	.V	.	.	.
10.400	1.7728	2.67	.	Q	.V	.	.	.
10.417	1.7765	2.68	.	Q	.V	.	.	.
10.433	1.7802	2.68	.	Q	.V	.	.	.
10.450	1.7839	2.69	.	Q	.V	.	.	.
10.467	1.7876	2.69	.	Q	.V	.	.	.
10.483	1.7913	2.70	.	Q	.V	.	.	.
10.500	1.7951	2.70	.	Q	.V	.	.	.
10.517	1.7988	2.70	.	Q	.V	.	.	.
10.533	1.8025	2.71	.	Q	.V	.	.	.
10.550	1.8063	2.71	.	Q	.V	.	.	.
10.567	1.8100	2.72	.	Q	.V	.	.	.
10.583	1.8137	2.72	.	Q	.V	.	.	.
10.600	1.8175	2.72	.	Q	.V	.	.	.

10.617	1.8212	2.73	. Q	.V	.	.	.
10.633	1.8250	2.73	. Q	.V	.	.	.
10.650	1.8288	2.73	. Q	.V	.	.	.
10.667	1.8325	2.73	. Q	.V	.	.	.
10.683	1.8363	2.73	. Q	.V	.	.	.
10.700	1.8401	2.74	. Q	. V	.	.	.
10.717	1.8438	2.74	. Q	. V	.	.	.
10.733	1.8476	2.74	. Q	. V	.	.	.
10.750	1.8514	2.75	. Q	. V	.	.	.
10.767	1.8552	2.75	. Q	. V	.	.	.
10.783	1.8590	2.76	. Q	. V	.	.	.
10.800	1.8628	2.76	. Q	. V	.	.	.
10.817	1.8666	2.77	. Q	. V	.	.	.
10.833	1.8704	2.77	. Q	. V	.	.	.
10.850	1.8743	2.78	. Q	. V	.	.	.
10.867	1.8781	2.78	. Q	. V	.	.	.
10.883	1.8819	2.79	. Q	. V	.	.	.
10.900	1.8858	2.79	. Q	. V	.	.	.
10.917	1.8896	2.79	. Q	. V	.	.	.
10.933	1.8935	2.80	. Q	. V	.	.	.
10.950	1.8973	2.80	. Q	. V	.	.	.
10.967	1.9012	2.80	. Q	. V	.	.	.
10.983	1.9051	2.81	. Q	. V	.	.	.
11.000	1.9089	2.81	. Q	. V	.	.	.
11.017	1.9128	2.81	. Q	. V	.	.	.
11.033	1.9167	2.81	. Q	. V	.	.	.
11.050	1.9205	2.82	. Q	. V	.	.	.
11.067	1.9244	2.82	. Q	. V	.	.	.
11.083	1.9283	2.83	. Q	. V	.	.	.
11.100	1.9322	2.83	. Q	. V	.	.	.
11.117	1.9361	2.84	. Q	. V	.	.	.
11.133	1.9400	2.84	. Q	. V	.	.	.
11.150	1.9440	2.85	. Q	. V	.	.	.
11.167	1.9479	2.85	. Q	. V	.	.	.
11.183	1.9518	2.86	. Q	. V	.	.	.
11.200	1.9558	2.86	. Q	. V	.	.	.
11.217	1.9597	2.87	. Q	. V	.	.	.
11.233	1.9637	2.87	. Q	. V	.	.	.
11.250	1.9676	2.88	. Q	. V	.	.	.
11.267	1.9716	2.88	. Q	. V	.	.	.
11.283	1.9756	2.88	. Q	. V	.	.	.
11.300	1.9796	2.88	. Q	. V	.	.	.
11.317	1.9835	2.89	. Q	. V	.	.	.
11.333	1.9875	2.89	. Q	. V	.	.	.
11.350	1.9915	2.89	. Q	. V	.	.	.
11.367	1.9955	2.90	. Q	. V	.	.	.
11.383	1.9995	2.90	. Q	. V	.	.	.
11.400	2.0035	2.90	. Q	. V	.	.	.
11.417	2.0075	2.91	. Q	. V	.	.	.
11.433	2.0115	2.92	. Q	. V	.	.	.
11.450	2.0155	2.92	. Q	. V	.	.	.
11.467	2.0196	2.93	. Q	. V	.	.	.
11.483	2.0236	2.93	. Q	. V	.	.	.
11.500	2.0277	2.94	. Q	. V	.	.	.
11.517	2.0317	2.95	. Q	. V	.	.	.
11.533	2.0358	2.95	. Q	. V	.	.	.
11.550	2.0399	2.96	. Q	. V	.	.	.
11.567	2.0439	2.96	. Q	. V	.	.	.
11.583	2.0480	2.97	. Q	. V	.	.	.
11.600	2.0521	2.97	. Q	. V	.	.	.
11.617	2.0562	2.97	. Q	. V	.	.	.
11.633	2.0603	2.98	. Q	. V	.	.	.
11.650	2.0644	2.98	. Q	. V	.	.	.
11.667	2.0685	2.98	. Q	. V	.	.	.
11.683	2.0726	2.98	. Q	. V	.	.	.
11.700	2.0767	2.99	. Q	. V	.	.	.
11.717	2.0809	2.99	. Q	. V	.	.	.
11.733	2.0850	3.00	. Q	. V	.	.	.
11.750	2.0891	3.00	. Q	. V	.	.	.
11.767	2.0933	3.01	. Q	. V	.	.	.
11.783	2.0974	3.02	. Q	. V	.	.	.
11.800	2.1016	3.02	. Q	. V	.	.	.
11.817	2.1058	3.03	. Q	. V	.	.	.
11.833	2.1100	3.04	. Q	. V	.	.	.
11.850	2.1142	3.04	. Q	. V	.	.	.
11.867	2.1184	3.05	. Q	. V	.	.	.
11.883	2.1226	3.06	. Q	. V	.	.	.
11.900	2.1268	3.06	. Q	. V	.	.	.
11.917	2.1310	3.07	. Q	. V	.	.	.

11.933	2.1352	3.07	.	Q	.	V	.	.	.	
11.950	2.1395	3.07	.	Q	.	V	.	.	.	
11.967	2.1437	3.08	.	Q	.	V	.	.	.	
11.983	2.1479	3.08	.	Q	.	V	.	.	.	
12.000	2.1522	3.08	.	Q	.	V	.	.	.	
12.017	2.1564	3.09	.	Q	.	V	.	.	.	
12.033	2.1607	3.09	.	Q	.	V	.	.	.	
12.050	2.1650	3.10	.	Q	.	V	.	.	.	
12.067	2.1693	3.11	.	Q	.	V	.	.	.	
12.083	2.1736	3.13	.	Q	.	V	.	.	.	
12.100	2.1779	3.15	.	Q	.	V	.	.	.	
12.117	2.1823	3.17	.	Q	.	V	.	.	.	
12.133	2.1867	3.19	.	Q	.	V	.	.	.	
12.150	2.1911	3.21	.	Q	.	V	.	.	.	
12.167	2.1955	3.23	.	Q	.	V	.	.	.	
12.183	2.2000	3.25	.	Q	.	V	.	.	.	
12.200	2.2045	3.27	.	Q	.	V	.	.	.	
12.217	2.2090	3.28	.	Q	.	V	.	.	.	
12.233	2.2136	3.29	.	Q	.	V	.	.	.	
12.250	2.2181	3.29	.	Q	.	V	.	.	.	
12.267	2.2226	3.29	.	Q	.	V	.	.	.	
12.283	2.2272	3.30	.	Q	.	V	.	.	.	
12.300	2.2317	3.30	.	Q	.	V	.	.	.	
12.317	2.2363	3.31	.	Q	.	V	.	.	.	
12.333	2.2409	3.31	.	Q	.	V	.	.	.	
12.350	2.2454	3.31	.	Q	.	V	.	.	.	
12.367	2.2500	3.32	.	Q	.	V	.	.	.	
12.383	2.2546	3.32	.	Q	.	V	.	.	.	
12.400	2.2592	3.33	.	Q	.	V	.	.	.	
12.417	2.2638	3.34	.	Q	.	V	.	.	.	
12.433	2.2684	3.35	.	Q	.	V	.	.	.	
12.450	2.2730	3.36	.	Q	.	V	.	.	.	
12.467	2.2776	3.37	.	Q	.	V	.	.	.	
12.483	2.2823	3.37	.	Q	.	V	.	.	.	
12.500	2.2869	3.38	.	Q	.	V	.	.	.	
12.517	2.2916	3.39	.	Q	.	V	.	.	.	
12.533	2.2963	3.40	.	Q	.	V	.	.	.	
12.550	2.3010	3.41	.	Q	.	V	.	.	.	
12.567	2.3057	3.41	.	Q	.	V	.	.	.	
12.583	2.3104	3.42	.	Q	.	V	.	.	.	
12.600	2.3151	3.42	.	Q	.	V	.	.	.	
12.617	2.3198	3.42	.	Q	.	V	.	.	.	
12.633	2.3245	3.43	.	Q	.	V	.	.	.	
12.650	2.3293	3.43	.	Q	.	V	.	.	.	
12.667	2.3340	3.44	.	Q	.	V	.	.	.	
12.683	2.3387	3.44	.	Q	.	V	.	.	.	
12.700	2.3435	3.45	.	Q	.	V	.	.	.	
12.717	2.3483	3.45	.	Q	.	V	.	.	.	
12.733	2.3530	3.46	.	Q	.	V	.	.	.	
12.750	2.3578	3.47	.	Q	.	V	.	.	.	
12.767	2.3626	3.48	.	Q	.	V	.	.	.	
12.783	2.3674	3.49	.	Q	.	V	.	.	.	
12.800	2.3722	3.50	.	Q	.	V	.	.	.	
12.817	2.3771	3.51	.	Q	.	V	.	.	.	
12.833	2.3819	3.52	.	Q	.	V	.	.	.	
12.850	2.3868	3.53	.	Q	.	V	.	.	.	
12.867	2.3917	3.54	.	Q	.	V	.	.	.	
12.883	2.3966	3.55	.	Q	.	V	.	.	.	
12.900	2.4015	3.55	.	Q	.	V	.	.	.	
12.917	2.4064	3.56	.	Q	.	V	.	.	.	
12.933	2.4113	3.56	.	Q	.	V	.	.	.	
12.950	2.4162	3.57	.	Q	.	V	.	.	.	
12.967	2.4211	3.57	.	Q	.	V	.	.	.	
12.983	2.4260	3.58	.	Q	.	V	.	.	.	
13.000	2.4310	3.58	.	Q	.	V	.	.	.	
13.017	2.4359	3.59	.	Q	.	V	.	.	.	
13.033	2.4409	3.59	.	Q	.	V	.	.	.	
13.050	2.4458	3.60	.	Q	.	V	.	.	.	
13.067	2.4508	3.61	.	Q	.	V	.	.	.	
13.083	2.4558	3.63	.	Q	.	V	.	.	.	
13.100	2.4608	3.64	.	Q	.	V	.	.	.	
13.117	2.4658	3.65	.	Q	.	V	.	.	.	
13.133	2.4709	3.66	.	Q	.	V	.	.	.	
13.150	2.4759	3.67	.	Q	.	V	.	.	.	
13.167	2.4810	3.68	.	Q	.	V	.	.	.	
13.183	2.4861	3.69	.	Q	.	V	.	.	.	
13.200	2.4912	3.70	.	Q	.	V	.	.	.	
13.217	2.4963	3.71	.	Q	.	V	.	.	.	
13.233	2.5014	3.72	.	Q	.	V	.	.	.	

13.250	2.5065	3.72	.	Q	.	V	.	.	.
13.267	2.5117	3.73	.	Q	.	V	.	.	.
13.283	2.5168	3.73	.	Q	.	V	.	.	.
13.300	2.5220	3.74	.	Q	.	V	.	.	.
13.317	2.5271	3.75	.	Q	.	V	.	.	.
13.333	2.5323	3.75	.	Q	.	V	.	.	.
13.350	2.5375	3.76	.	Q	.	V	.	.	.
13.367	2.5427	3.77	.	Q	.	V	.	.	.
13.383	2.5479	3.78	.	Q	.	V	.	.	.
13.400	2.5531	3.79	.	Q	.	V	.	.	.
13.417	2.5583	3.80	.	Q	.	V	.	.	.
13.433	2.5636	3.82	.	Q	.	V	.	.	.
13.450	2.5689	3.83	.	Q	.	V	.	.	.
13.467	2.5742	3.84	.	Q	.	V	.	.	.
13.483	2.5795	3.86	.	Q	.	V	.	.	.
13.500	2.5848	3.87	.	Q	.	V	.	.	.
13.517	2.5901	3.88	.	Q	.	V	.	.	.
13.533	2.5955	3.89	.	Q	.	V	.	.	.
13.550	2.6009	3.90	.	Q	.	V	.	.	.
13.567	2.6063	3.91	.	Q	.	V	.	.	.
13.583	2.6117	3.92	.	Q	.	V	.	.	.
13.600	2.6171	3.92	.	Q	.	V	.	.	.
13.617	2.6225	3.93	.	Q	.	V	.	.	.
13.633	2.6279	3.94	.	Q	.	V	.	.	.
13.650	2.6333	3.95	.	Q	.	V	.	.	.
13.667	2.6388	3.95	.	Q	.	V	.	.	.
13.683	2.6442	3.96	.	Q	.	V	.	.	.
13.700	2.6497	3.97	.	Q	.	V	.	.	.
13.717	2.6552	3.98	.	Q	.	V	.	.	.
13.733	2.6607	4.00	.	Q	.	V	.	.	.
13.750	2.6662	4.02	.	Q	.	V	.	.	.
13.767	2.6718	4.03	.	Q	.	V	.	.	.
13.783	2.6774	4.05	.	Q	.	V	.	.	.
13.800	2.6830	4.06	.	Q	.	V	.	.	.
13.817	2.6886	4.08	.	Q	.	V	.	.	.
13.833	2.6942	4.09	.	Q	.	V	.	.	.
13.850	2.6999	4.11	.	Q	.	V	.	.	.
13.867	2.7056	4.12	.	Q	.	V	.	.	.
13.883	2.7112	4.13	.	Q	.	V	.	.	.
13.900	2.7170	4.14	.	Q	.	V	.	.	.
13.917	2.7227	4.15	.	Q	.	V	.	.	.
13.933	2.7284	4.16	.	Q	.	V	.	.	.
13.950	2.7341	4.17	.	Q	.	V	.	.	.
13.967	2.7399	4.18	.	Q	.	V	.	.	.
13.983	2.7457	4.19	.	Q	.	V	.	.	.
14.000	2.7514	4.19	.	Q	.	V	.	.	.
14.017	2.7572	4.20	.	Q	.	V	.	.	.
14.033	2.7630	4.20	.	Q	.	V	.	.	.
14.050	2.7688	4.18	.	Q	.	V	.	.	.
14.067	2.7745	4.16	.	Q	.	V	.	.	.
14.083	2.7802	4.13	.	Q	.	V	.	.	.
14.100	2.7858	4.11	.	Q	.	V	.	.	.
14.117	2.7915	4.09	.	Q	.	V	.	.	.
14.133	2.7971	4.06	.	Q	.	V	.	.	.
14.150	2.8026	4.04	.	Q	.	V	.	.	.
14.167	2.8082	4.02	.	Q	.	V	.	.	.
14.183	2.8137	3.99	.	Q	.	V	.	.	.
14.200	2.8192	3.99	.	Q	.	V	.	.	.
14.217	2.8247	4.00	.	Q	.	V	.	.	.
14.233	2.8302	4.01	.	Q	.	V	.	.	.
14.250	2.8357	4.02	.	Q	.	V	.	.	.
14.267	2.8413	4.03	.	Q	.	V	.	.	.
14.283	2.8468	4.04	.	Q	.	V	.	.	.
14.300	2.8524	4.05	.	Q	.	V	.	.	.
14.317	2.8580	4.06	.	Q	.	V	.	.	.
14.333	2.8636	4.08	.	Q	.	V	.	.	.
14.350	2.8693	4.09	.	Q	.	V	.	.	.
14.367	2.8749	4.11	.	Q	.	V	.	.	.
14.383	2.8806	4.13	.	Q	.	V	.	.	.
14.400	2.8864	4.16	.	Q	.	V	.	.	.
14.417	2.8921	4.18	.	Q	.	V	.	.	.
14.433	2.8979	4.21	.	Q	.	V	.	.	.
14.450	2.9037	4.24	.	Q	.	V	.	.	.
14.467	2.9096	4.26	.	Q	.	V	.	.	.
14.483	2.9155	4.29	.	Q	.	V	.	.	.
14.500	2.9215	4.31	.	Q	.	V	.	.	.
14.517	2.9274	4.34	.	Q	.	V	.	.	.
14.533	2.9335	4.36	.	Q	.	V	.	.	.
14.550	2.9395	4.37	.	Q	.	V	.	.	.

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14.567      2.9455      4.39  .   Q     .        V.         .         .
14.583      2.9516      4.41  .   Q     .        V.         .         .
14.600      2.9577      4.42  .   Q     .        V.         .         .
14.617      2.9638      4.44  .   Q     .        V.         .         .
14.633      2.9699      4.45  .   Q     .        V.         .         .
14.650      2.9761      4.47  .   Q     .        V.         .         .
14.667      2.9822      4.48  .   Q     .        V.         .         .
14.683      2.9884      4.50  .   Q     .        V.         .         .
14.700      2.9947      4.53  .   Q     .        V.         .         .
14.717      3.0010      4.56  .   Q     .        V.         .         .
14.733      3.0073      4.60  .   Q     .        V.         .         .
14.750      3.0137      4.63  .   Q     .        V.         .         .
14.767      3.0201      4.67  .   Q     .        V.         .         .
14.783      3.0266      4.70  .   Q     .        V.         .         .
14.800      3.0331      4.74  .   Q     .        V.         .         .
14.817      3.0397      4.78  .   Q     .        V.         .         .
14.833      3.0463      4.81  .   Q     .        V.         .         .
14.850      3.0530      4.85  .   Q     .        V.         .         .
14.867      3.0597      4.87  .   Q     .        V.         .         .
14.883      3.0664      4.89  .   Q     .         V         .         .
14.900      3.0732      4.91  .   Q     .         V         .         .
14.917      3.0800      4.94  .   Q     .         V         .         .
14.933      3.0868      4.96  .   Q     .         V         .         .
14.950      3.0937      4.98  .   Q     .         V         .         .
14.967      3.1006      5.00  .   Q     .         V         .         .
14.983      3.1075      5.02  .   Q     .         V         .         .
15.000      3.1144      5.04  .   Q     .         V         .         .
15.017      3.1214      5.07  .   Q     .         V         .         .
15.033      3.1285      5.12  .    Q    .         V         .         .
15.050      3.1356      5.18  .    Q    .         V         .         .
15.067      3.1428      5.24  .    Q    .         V         .         .
15.083      3.1501      5.30  .    Q    .         V         .         .
15.100      3.1575      5.36  .    Q    .         V         .         .
15.117      3.1650      5.42  .    Q    .         V         .         .
15.133      3.1725      5.48  .    Q    .         V         .         .
15.150      3.1801      5.54  .    Q    .         V         .         .
15.167      3.1879      5.60  .    Q    .         V         .         .
15.183      3.1956      5.65  .    Q    .         V         .         .
15.200      3.2035      5.69  .    Q    .         V         .         .
15.217      3.2114      5.73  .    Q    .         V         .         .
15.233      3.2193      5.77  .    Q    .         .V        .         .
15.250      3.2273      5.81  .    Q    .         .V        .         .
15.267      3.2354      5.85  .    Q    .         .V        .         .
15.283      3.2435      5.89  .    Q    .         .V        .         .
15.300      3.2517      5.93  .    Q    .         .V        .         .
15.317      3.2599      5.97  .    Q    .         .V        .         .
15.333      3.2682      6.01  .    Q    .         .V        .         .
15.350      3.2765      6.03  .    Q    .         .V        .         .
15.367      3.2847      5.99  .    Q    .         .V        .         .
15.383      3.2929      5.93  .    Q    .         .V        .         .
15.400      3.3010      5.88  .    Q    .         .V        .         .
15.417      3.3090      5.82  .    Q    .         .V        .         .
15.433      3.3170      5.77  .    Q    .         .V        .         .
15.450      3.3249      5.72  .    Q    .         .V        .         .
15.467      3.3327      5.66  .    Q    .         .V        .         .
15.483      3.3404      5.61  .    Q    .         .V        .         .
15.500      3.3480      5.55  .    Q    .         .V        .         .
15.517      3.3556      5.53  .    Q    .         .V        .         .
15.533      3.3634      5.61  .    Q    .         .V        .         .
15.550      3.3712      5.68  .    Q    .         . V       .         .
15.567      3.3791      5.76  .    Q    .         . V       .         .
15.583      3.3872      5.84  .    Q    .         . V       .         .
15.600      3.3953      5.92  .    Q    .         . V       .         .
15.617      3.4036      6.00  .    Q    .         . V       .         .
15.633      3.4120      6.08  .    Q    .         . V       .         .
15.650      3.4205      6.16  .     Q   .         . V       .         .
15.667      3.4291      6.24  .     Q   .         . V       .         .
15.683      3.4378      6.38  .     Q   .         . V       .         .
15.700      3.4470      6.65  .     Q   .         . V       .         .
15.717      3.4565      6.91  .     Q   .         . V       .         .
15.733      3.4664      7.18  .      Q  .         . V       .         .
15.750      3.4767      7.45  .      Q  .         . V       .         .
15.767      3.4873      7.72  .      Q  .         . V       .         .
15.783      3.4983      7.99  .      Q  .         . V       .         .
15.800      3.5097      8.26  .       Q .         . V       .         .
15.817      3.5215      8.53  .       Q .         . V       .         .
15.833      3.5336      8.80  .       Q .         .  V      .         .
15.850      3.5462      9.11  .       Q .         .  V      .         .
15.867      3.5592      9.48  .        Q.         .  V      .         .
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15.883      3.5728      9.84  .        Q.         .  V      .         .
15.900      3.5868     10.21  .         Q         .  V      .         .
15.917      3.6014     10.58  .         Q         .  V      .         .
15.933      3.6165     10.94  .         Q         .  V      .         .
15.950      3.6320     11.31  .         .Q        .  V      .         .
15.967      3.6481     11.67  .         .Q        .  V      .         .
15.983      3.6647     12.04  .         .Q        .  V      .         .
16.000      3.6818     12.41  .         . Q       .   V     .         .
16.017      3.7011     14.01  .         .  Q      .   V     .         .
16.033      3.7243     16.84  .         .     Q   .   V     .         .
16.050      3.7514     19.67  .         .        Q.   V     .         .
16.067      3.7824     22.51  .         .         . Q V     .         .
16.083      3.8173     25.34  .         .         .   Q     .         .
16.100      3.8561     28.18  .         .         .    V Q  .         .
16.117      3.8988     31.01  .         .         .    V    Q         .
16.133      3.9454     33.84  .         .         .    V     .  Q      .
16.150      3.9959     36.68  .         .         .     V    .    Q    .
16.167      4.0519     40.64  .         .         .     V    .        Q
16.183      4.1051     38.63  .         .         .     V    .      Q .
16.200      4.1537     35.27  .         .         .      V   .   Q     .
16.217      4.1977     31.92  .         .         .      V  .Q         .
16.233      4.2370     28.56  .         .         .      VQ .          .
16.250      4.2717     25.20  .         .         .   Q  V  .          .
16.267      4.3018     21.85  .         .        .Q      V  .          .
16.283      4.3273     18.49  .         .       Q .      V  .          .
16.300      4.3482     15.13  .         .   Q     .      V  .          .
16.317      4.3644     11.78  .         .Q        .      V  .          .
16.333      4.3761      8.49  .       Q .         .      V  .          .
16.350      4.3862      7.34  .      Q  .         .      V  .          .
16.367      4.3962      7.24  .      Q  .         .      V  .          .
16.383      4.4060      7.14  .      Q  .         .      V  .          .
16.400      4.4157      7.04  .     Q   .         .      V  .          .
16.417      4.4253      6.94  .     Q   .         .      V  .          .
16.433      4.4347      6.84  .     Q   .         .      V  .          .
16.450      4.4440      6.74  .     Q   .         .       V.           .
16.467      4.4531      6.64  .     Q   .         .       V.           .
16.483      4.4621      6.54  .     Q   .         .       V.           .
16.500      4.4710      6.44  .     Q   .         .       V.           .
16.517      4.4797      6.34  .     Q   .         .       V.           .
16.533      4.4883      6.23  .     Q   .         .       V.           .
16.550      4.4967      6.11  .     Q   .         .       V.           .
16.567      4.5050      6.00  .    Q    .         .       V.           .
16.583      4.5131      5.89  .    Q    .         .       V.           .
16.600      4.5211      5.78  .    Q    .         .       V.           .
16.617      4.5289      5.67  .    Q    .         .       V.           .
16.633      4.5366      5.56  .    Q    .         .       V.           .
16.650      4.5441      5.45  .    Q    .         .       V.           .
16.667      4.5514      5.34  .    Q    .         .       V.           .
16.683      4.5587      5.27  .    Q    .         .       V.           .
16.700      4.5658      5.20  .    Q    .         .       V.           .
16.717      4.5729      5.13  .    Q    .         .       V.           .
16.733      4.5799      5.07  .   Q     .         .       V.           .
16.750      4.5868      5.00  .   Q     .         .       V.           .
16.767      4.5936      4.93  .   Q     .         .       V.           .
16.783      4.6003      4.87  .   Q     .         .        V           .
16.800      4.6069      4.80  .   Q     .         .        V           .
16.817      4.6134      4.73  .   Q     .         .        V           .
16.833      4.6198      4.67  .   Q     .         .        V           .
16.850      4.6262      4.62  .   Q     .         .        V           .
16.867      4.6325      4.58  .   Q     .         .        V           .
16.883      4.6388      4.53  .   Q     .         .        V           .
16.900      4.6449      4.48  .   Q     .         .        V           .
16.917      4.6510      4.44  .   Q     .         .        V           .
16.933      4.6571      4.39  .   Q     .         .        V           .
16.950      4.6631      4.35  .   Q     .         .        V           .
16.967      4.6690      4.30  .   Q     .         .        V           .
16.983      4.6749      4.26  .   Q     .         .        V           .
17.000      4.6807      4.22  .   Q     .         .        V           .
17.017      4.6865      4.22  .   Q     .         .        V           .
17.033      4.6923      4.22  .   Q     .         .        V           .
17.050      4.6981      4.22  .   Q     .         .        V           .
17.067      4.7039      4.22  .   Q     .         .        V           .
17.083      4.7097      4.22  .   Q     .         .        V           .
17.100      4.7156      4.22  .   Q     .         .        V           .
17.117      4.7214      4.22  .   Q     .         .        V           .
17.133      4.7272      4.22  .   Q     .         .        V           .
17.150      4.7330      4.22  .   Q     .         .        V           .
17.167      4.7388      4.22  .   Q     .         .        V           .
17.183      4.7446      4.20  .   Q     .         .        V           .
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17.200	4.7504	4.18	.	Q	.	.	.V	.
17.217	4.7561	4.17	.	Q	.	.	.V	.
17.233	4.7618	4.15	.	Q	.	.	.V	.
17.250	4.7675	4.13	.	Q	.	.	.V	.
17.267	4.7732	4.11	.	Q	.	.	.V	.
17.283	4.7788	4.09	.	Q	.	.	.V	.
17.300	4.7844	4.07	.	Q	.	.	.V	.
17.317	4.7900	4.05	.	Q	.	.	.V	.
17.333	4.7956	4.04	.	Q	.	.	.V	.
17.350	4.8011	4.01	.	Q	.	.	.V	.
17.367	4.8066	3.99	.	Q	.	.	.V	.
17.383	4.8121	3.97	.	Q	.	.	.V	.
17.400	4.8175	3.95	.	Q	.	.	.V	.
17.417	4.8229	3.93	.	Q	.	.	.V	.
17.433	4.8283	3.91	.	Q	.	.	.V	.
17.450	4.8336	3.88	.	Q	.	.	.V	.
17.467	4.8390	3.86	.	Q	.	.	.V	.
17.483	4.8443	3.84	.	Q	.	.	.V	.
17.500	4.8495	3.82	.	Q	.	.	.V	.
17.517	4.8548	3.80	.	Q	.	.	.V	.
17.533	4.8600	3.79	.	Q	.	.	.V	.
17.550	4.8652	3.77	.	Q	.	.	.V	.
17.567	4.8703	3.75	.	Q	.	.	.V	.
17.583	4.8755	3.73	.	Q	.	.	.V	.
17.600	4.8806	3.71	.	Q	.	.	.V	.
17.617	4.8857	3.69	.	Q	.	.	.V	.
17.633	4.8907	3.68	.	Q	.	.	.V	.
17.650	4.8958	3.66	.	Q	.	.	.V	.
17.667	4.9008	3.64	.	Q	.	.	.V	.
17.683	4.9058	3.63	.	Q	.	.	. V	.
17.700	4.9108	3.61	.	Q	.	.	. V	.
17.717	4.9157	3.60	.	Q	.	.	. V	.
17.733	4.9206	3.58	.	Q	.	.	. V	.
17.750	4.9255	3.56	.	Q	.	.	. V	.
17.767	4.9304	3.55	.	Q	.	.	. V	.
17.783	4.9353	3.53	.	Q	.	.	. V	.
17.800	4.9401	3.52	.	Q	.	.	. V	.
17.817	4.9450	3.50	.	Q	.	.	. V	.
17.833	4.9498	3.49	.	Q	.	.	. V	.
17.850	4.9546	3.47	.	Q	.	.	. V	.
17.867	4.9593	3.46	.	Q	.	.	. V	.
17.883	4.9641	3.45	.	Q	.	.	. V	.
17.900	4.9688	3.43	.	Q	.	.	. V	.
17.917	4.9735	3.42	.	Q	.	.	. V	.
17.933	4.9782	3.41	.	Q	.	.	. V	.
17.950	4.9829	3.39	.	Q	.	.	. V	.
17.967	4.9875	3.38	.	Q	.	.	. V	.
17.983	4.9922	3.37	.	Q	.	.	. V	.
18.000	4.9968	3.35	.	Q	.	.	. V	.
18.017	5.0014	3.33	.	Q	.	.	. V	.
18.033	5.0059	3.31	.	Q	.	.	. V	.
18.050	5.0105	3.29	.	Q	.	.	. V	.
18.067	5.0150	3.27	.	Q	.	.	. V	.
18.083	5.0194	3.25	.	Q	.	.	. V	.
18.100	5.0239	3.23	.	Q	.	.	. V	.
18.117	5.0283	3.21	.	Q	.	.	. V	.
18.133	5.0327	3.19	.	Q	.	.	. V	.
18.150	5.0371	3.18	.	Q	.	.	. V	.
18.167	5.0415	3.16	.	Q	.	.	. V	.
18.183	5.0458	3.14	.	Q	.	.	. V	.
18.200	5.0501	3.13	.	Q	.	.	. V	.
18.217	5.0544	3.12	.	Q	.	.	. V	.
18.233	5.0587	3.10	.	Q	.	.	. V	.
18.250	5.0629	3.09	.	Q	.	.	. V	.
18.267	5.0671	3.07	.	Q	.	.	. V	.
18.283	5.0714	3.06	.	Q	.	.	. V	.
18.300	5.0755	3.04	.	Q	.	.	. V	.
18.317	5.0797	3.03	.	Q	.	.	. V	.
18.333	5.0839	3.02	.	Q	.	.	. V	.
18.350	5.0880	3.01	.	Q	.	.	. V	.
18.367	5.0921	3.00	.	Q	.	.	. V	.
18.383	5.0962	2.99	.	Q	.	.	. V	.
18.400	5.1003	2.98	.	Q	.	.	. V	.
18.417	5.1044	2.97	.	Q	.	.	. V	.
18.433	5.1085	2.96	.	Q	.	.	. V	.
18.450	5.1126	2.95	.	Q	.	.	. V	.
18.467	5.1166	2.94	.	Q	.	.	. V	.
18.483	5.1207	2.93	.	Q	.	.	. V	.
18.500	5.1247	2.92	.	Q	.	.	. V	.

18.517	5.1287	2.91	.	Q	.	.	.	V	.
18.533	5.1327	2.90	.	Q	.	.	.	V	.
18.550	5.1367	2.89	.	Q	.	.	.	V	.
18.567	5.1406	2.89	.	Q	.	.	.	V	.
18.583	5.1446	2.88	.	Q	.	.	.	V	.
18.600	5.1486	2.87	.	Q	.	.	.	V	.
18.617	5.1525	2.86	.	Q	.	.	.	V	.
18.633	5.1564	2.85	.	Q	.	.	.	V	.
18.650	5.1603	2.84	.	Q	.	.	.	V	.
18.667	5.1643	2.83	.	Q	.	.	.	V	.
18.683	5.1681	2.83	.	Q	.	.	.	V	.
18.700	5.1720	2.82	.	Q	.	.	.	V	.
18.717	5.1759	2.81	.	Q	.	.	.	V	.
18.733	5.1798	2.80	.	Q	.	.	.	V	.
18.750	5.1836	2.80	.	Q	.	.	.	V	.
18.767	5.1875	2.79	.	Q	.	.	.	V	.
18.783	5.1913	2.78	.	Q	.	.	.	V	.
18.800	5.1951	2.77	.	Q	.	.	.	V	.
18.817	5.1989	2.76	.	Q	.	.	.	V	.
18.833	5.2027	2.76	.	Q	.	.	.	V	.
18.850	5.2065	2.75	.	Q	.	.	.	V	.
18.867	5.2103	2.74	.	Q	.	.	.	V	.
18.883	5.2140	2.74	.	Q	.	.	.	V	.
18.900	5.2178	2.73	.	Q	.	.	.	V	.
18.917	5.2215	2.72	.	Q	.	.	.	V	.
18.933	5.2253	2.71	.	Q	.	.	.	V	.
18.950	5.2290	2.71	.	Q	.	.	.	V	.
18.967	5.2327	2.70	.	Q	.	.	.	V	.
18.983	5.2364	2.69	.	Q	.	.	.	V	.
19.000	5.2401	2.69	.	Q	.	.	.	V	.
19.017	5.2438	2.68	.	Q	.	.	.	V	.
19.033	5.2475	2.67	.	Q	.	.	.	V	.
19.050	5.2512	2.67	.	Q	.	.	.	V	.
19.067	5.2548	2.66	.	Q	.	.	.	V	.
19.083	5.2585	2.65	.	Q	.	.	.	V	.
19.100	5.2621	2.65	.	Q	.	.	.	V	.
19.117	5.2658	2.64	.	Q	.	.	.	V	.
19.133	5.2694	2.63	.	Q	.	.	.	V	.
19.150	5.2730	2.63	.	Q	.	.	.	V	.
19.167	5.2766	2.62	.	Q	.	.	.	V	.
19.183	5.2802	2.61	.	Q	.	.	.	V	.
19.200	5.2838	2.61	.	Q	.	.	.	V	.
19.217	5.2874	2.60	.	Q	.	.	.	V	.
19.233	5.2910	2.60	.	Q	.	.	.	V	.
19.250	5.2945	2.59	.	Q	.	.	.	V	.
19.267	5.2981	2.58	.	Q	.	.	.	V	.
19.283	5.3017	2.58	.	Q	.	.	.	V	.
19.300	5.3052	2.57	.	Q	.	.	.	V	.
19.317	5.3087	2.57	.	Q	.	.	.	V	.
19.333	5.3123	2.56	.	Q	.	.	.	V	.
19.350	5.3158	2.55	.	Q	.	.	.	V	.
19.367	5.3193	2.55	.	Q	.	.	.	V	.
19.383	5.3228	2.54	.	Q	.	.	.	V	.
19.400	5.3263	2.54	.	Q	.	.	.	V	.
19.417	5.3298	2.53	.	Q	.	.	.	V	.
19.433	5.3332	2.53	.	Q	.	.	.	V	.
19.450	5.3367	2.52	.	Q	.	.	.	V	.
19.467	5.3402	2.51	.	Q	.	.	.	V	.
19.483	5.3436	2.51	.	Q	.	.	.	V	.
19.500	5.3471	2.50	.	Q	.	.	.	V	.
19.517	5.3505	2.50	.	Q	.	.	.	V	.
19.533	5.3540	2.49	.	Q	.	.	.	V	.
19.550	5.3574	2.49	.	Q	.	.	.	V	.
19.567	5.3608	2.48	.	Q	.	.	.	V	.
19.583	5.3642	2.48	.	Q	.	.	.	V	.
19.600	5.3676	2.47	.	Q	.	.	.	V	.
19.617	5.3710	2.47	.	Q	.	.	.	V	.
19.633	5.3744	2.46	.	Q	.	.	.	V	.
19.650	5.3778	2.46	.	Q	.	.	.	V	.
19.667	5.3812	2.45	.	Q	.	.	.	V	.
19.683	5.3845	2.45	.	Q	.	.	.	V	.
19.700	5.3879	2.44	.	Q	.	.	.	V	.
19.717	5.3912	2.44	.	Q	.	.	.	V	.
19.733	5.3946	2.43	.	Q	.	.	.	V	.
19.750	5.3979	2.43	.	Q	.	.	.	V	.
19.767	5.4013	2.42	.	Q	.	.	.	V	.
19.783	5.4046	2.42	.	Q	.	.	.	V	.
19.800	5.4079	2.41	.	Q	.	.	.	V	.
19.817	5.4112	2.41	.	Q	.	.	.	V	.

19.833	5.4145	2.40	.	Q	.	.	.	V	.
19.850	5.4178	2.40	.	Q	.	.	.	V	.
19.867	5.4211	2.39	.	Q	.	.	.	V	.
19.883	5.4244	2.39	.	Q	.	.	.	V	.
19.900	5.4277	2.38	.	Q	.	.	.	V	.
19.917	5.4310	2.38	.	Q	.	.	.	V	.
19.933	5.4343	2.37	.	Q	.	.	.	V	.
19.950	5.4375	2.37	.	Q	.	.	.	V	.
19.967	5.4408	2.36	.	Q	.	.	.	V	.
19.983	5.4440	2.36	.	Q	.	.	.	V	.
20.000	5.4473	2.36	.	Q	.	.	.	V	.
20.017	5.4505	2.35	.	Q	.	.	.	V	.
20.033	5.4538	2.35	.	Q	.	.	.	V	.
20.050	5.4570	2.34	.	Q	.	.	.	V	.
20.067	5.4602	2.34	.	Q	.	.	.	V	.
20.083	5.4634	2.33	.	Q	.	.	.	V	.
20.100	5.4666	2.33	.	Q	.	.	.	V	.
20.117	5.4698	2.33	.	Q	.	.	.	V	.
20.133	5.4730	2.32	.	Q	.	.	.	V	.
20.150	5.4762	2.32	.	Q	.	.	.	V	.
20.167	5.4794	2.31	.	Q	.	.	.	V	.
20.183	5.4826	2.31	.	Q	.	.	.	V	.
20.200	5.4858	2.30	.	Q	.	.	.	V	.
20.217	5.4889	2.30	.	Q	.	.	.	V	.
20.233	5.4921	2.30	.	Q	.	.	.	V	.
20.250	5.4952	2.29	.	Q	.	.	.	V	.
20.267	5.4984	2.29	.	Q	.	.	.	V	.
20.283	5.5015	2.28	.	Q	.	.	.	V	.
20.300	5.5047	2.28	.	Q	.	.	.	V	.
20.317	5.5078	2.28	.	Q	.	.	.	V	.
20.333	5.5110	2.27	.	Q	.	.	.	V	.
20.350	5.5141	2.27	.	Q	.	.	.	V	.
20.367	5.5172	2.26	.	Q	.	.	.	V	.
20.383	5.5203	2.26	.	Q	.	.	.	V	.
20.400	5.5234	2.26	.	Q	.	.	.	V	.
20.417	5.5265	2.25	.	Q	.	.	.	V	.
20.433	5.5296	2.25	.	Q	.	.	.	V	.
20.450	5.5327	2.25	.	Q	.	.	.	V	.
20.467	5.5358	2.24	.	Q	.	.	.	V	.
20.483	5.5389	2.24	.	Q	.	.	.	V	.
20.500	5.5420	2.23	.	Q	.	.	.	V	.
20.517	5.5450	2.23	.	Q	.	.	.	V	.
20.533	5.5481	2.23	.	Q	.	.	.	V	.
20.550	5.5512	2.22	.	Q	.	.	.	V	.
20.567	5.5542	2.22	.	Q	.	.	.	V	.
20.583	5.5573	2.22	.	Q	.	.	.	V	.
20.600	5.5603	2.21	.	Q	.	.	.	V	.
20.617	5.5634	2.21	.	Q	.	.	.	V	.
20.633	5.5664	2.20	.	Q	.	.	.	V	.
20.650	5.5694	2.20	.	Q	.	.	.	V	.
20.667	5.5725	2.20	.	Q	.	.	.	V	.
20.683	5.5755	2.19	.	Q	.	.	.	V	.
20.700	5.5785	2.19	.	Q	.	.	.	V	.
20.717	5.5815	2.19	.	Q	.	.	.	V	.
20.733	5.5845	2.18	.	Q	.	.	.	V	.
20.750	5.5875	2.18	.	Q	.	.	.	V	.
20.767	5.5905	2.18	.	Q	.	.	.	V	.
20.783	5.5935	2.17	.	Q	.	.	.	V	.
20.800	5.5965	2.17	.	Q	.	.	.	V	.
20.817	5.5995	2.17	.	Q	.	.	.	V	.
20.833	5.6025	2.16	.	Q	.	.	.	V	.
20.850	5.6054	2.16	.	Q	.	.	.	V	.
20.867	5.6084	2.16	.	Q	.	.	.	V	.
20.883	5.6114	2.15	.	Q	.	.	.	V	.
20.900	5.6143	2.15	.	Q	.	.	.	V	.
20.917	5.6173	2.15	.	Q	.	.	.	V	.
20.933	5.6203	2.14	.	Q	.	.	.	V	.
20.950	5.6232	2.14	.	Q	.	.	.	V	.
20.967	5.6261	2.14	.	Q	.	.	.	V	.
20.983	5.6291	2.13	.	Q	.	.	.	V	.
21.000	5.6320	2.13	.	Q	.	.	.	V	.
21.017	5.6349	2.13	.	Q	.	.	.	V	.
21.033	5.6379	2.12	.	Q	.	.	.	V	.
21.050	5.6408	2.12	.	Q	.	.	.	V	.
21.067	5.6437	2.12	.	Q	.	.	.	V	.
21.083	5.6466	2.12	.	Q	.	.	.	V	.
21.100	5.6495	2.11	.	Q	.	.	.	V	.
21.117	5.6524	2.11	.	Q	.	.	.	V	.
21.133	5.6553	2.11	.	Q	.	.	.	V	.

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21.150      5.6582      2.10  . Q       .         .         .     V   .
21.167      5.6611      2.10  . Q       .         .         .     V   .
21.183      5.6640      2.10  . Q       .         .         .     V   .
21.200      5.6669      2.09  . Q       .         .         .     V   .
21.217      5.6698      2.09  . Q       .         .         .      V  .
21.233      5.6727      2.09  . Q       .         .         .      V  .
21.250      5.6755      2.08  . Q       .         .         .      V  .
21.267      5.6784      2.08  . Q       .         .         .      V  .
21.283      5.6813      2.08  . Q       .         .         .      V  .
21.300      5.6841      2.08  . Q       .         .         .      V  .
21.317      5.6870      2.07  . Q       .         .         .      V  .
21.333      5.6898      2.07  . Q       .         .         .      V  .
21.350      5.6927      2.07  . Q       .         .         .      V  .
21.367      5.6955      2.06  . Q       .         .         .      V  .
21.383      5.6984      2.06  . Q       .         .         .      V  .
21.400      5.7012      2.06  . Q       .         .         .      V  .
21.417      5.7040      2.06  . Q       .         .         .      V  .
21.433      5.7069      2.05  . Q       .         .         .      V  .
21.450      5.7097      2.05  . Q       .         .         .      V  .
21.467      5.7125      2.05  . Q       .         .         .      V  .
21.483      5.7153      2.04  . Q       .         .         .      V  .
21.500      5.7181      2.04  . Q       .         .         .      V  .
21.517      5.7209      2.04  . Q       .         .         .      V  .
21.533      5.7237      2.04  . Q       .         .         .      V  .
21.550      5.7265      2.03  . Q       .         .         .      V  .
21.567      5.7293      2.03  .Q        .         .         .      V  .
21.583      5.7321      2.03  .Q        .         .         .      V  .
21.600      5.7349      2.03  .Q        .         .         .      V  .
21.617      5.7377      2.02  .Q        .         .         .      V  .
21.633      5.7405      2.02  .Q        .         .         .      V  .
21.650      5.7433      2.02  .Q        .         .         .      V  .
21.667      5.7460      2.01  .Q        .         .         .      V  .
21.683      5.7488      2.01  .Q        .         .         .      V  .
21.700      5.7516      2.01  .Q        .         .         .      V  .
21.717      5.7543      2.01  .Q        .         .         .      V  .
21.733      5.7571      2.00  .Q        .         .         .      V  .
21.750      5.7599      2.00  .Q        .         .         .      V  .
21.767      5.7626      2.00  .Q        .         .         .      V  .
21.783      5.7654      2.00  .Q        .         .         .      V  .
21.800      5.7681      1.99  .Q        .         .         .      V  .
21.817      5.7709      1.99  .Q        .         .         .      V  .
21.833      5.7736      1.99  .Q        .         .         .      V  .
21.850      5.7763      1.99  .Q        .         .         .      V  .
21.867      5.7791      1.98  .Q        .         .         .      V  .
21.883      5.7818      1.98  .Q        .         .         .      V  .
21.900      5.7845      1.98  .Q        .         .         .      V  .
21.917      5.7872      1.98  .Q        .         .         .      V  .
21.933      5.7900      1.97  .Q        .         .         .      V  .
21.950      5.7927      1.97  .Q        .         .         .      V  .
21.967      5.7954      1.97  .Q        .         .         .      V  .
21.983      5.7981      1.97  .Q        .         .         .      V  .
22.000      5.8008      1.96  .Q        .         .         .      V  .
22.017      5.8035      1.96  .Q        .         .         .      V  .
22.033      5.8062      1.96  .Q        .         .         .      V  .
22.050      5.8089      1.96  .Q        .         .         .      V  .
22.067      5.8116      1.95  .Q        .         .         .      V  .
22.083      5.8143      1.95  .Q        .         .         .      V  .
22.100      5.8170      1.95  .Q        .         .         .      V  .
22.117      5.8196      1.95  .Q        .         .         .      V  .
22.133      5.8223      1.94  .Q        .         .         .       V .
22.150      5.8250      1.94  .Q        .         .         .       V .
22.167      5.8277      1.94  .Q        .         .         .       V .
22.183      5.8303      1.94  .Q        .         .         .       V .
22.200      5.8330      1.94  .Q        .         .         .       V .
22.217      5.8357      1.93  .Q        .         .         .       V .
22.233      5.8383      1.93  .Q        .         .         .       V .
22.250      5.8410      1.93  .Q        .         .         .       V .
22.267      5.8436      1.93  .Q        .         .         .       V .
22.283      5.8463      1.92  .Q        .         .         .       V .
22.300      5.8489      1.92  .Q        .         .         .       V .
22.317      5.8516      1.92  .Q        .         .         .       V .
22.333      5.8542      1.92  .Q        .         .         .       V .
22.350      5.8568      1.91  .Q        .         .         .       V .
22.367      5.8595      1.91  .Q        .         .         .       V .
22.383      5.8621      1.91  .Q        .         .         .       V .
22.400      5.8647      1.91  .Q        .         .         .       V .
22.417      5.8674      1.91  .Q        .         .         .       V .
22.433      5.8700      1.90  .Q        .         .         .       V .
22.450      5.8726      1.90  .Q        .         .         .       V .
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22.467	5.8752	1.90	.Q	.	.	.	V .
22.483	5.8778	1.90	.Q	.	.	.	V .
22.500	5.8804	1.89	.Q	.	.	.	V .
22.517	5.8831	1.89	.Q	.	.	.	V .
22.533	5.8857	1.89	.Q	.	.	.	V .
22.550	5.8883	1.89	.Q	.	.	.	V .
22.567	5.8909	1.89	.Q	.	.	.	V .
22.583	5.8935	1.88	.Q	.	.	.	V .
22.600	5.8960	1.88	.Q	.	.	.	V .
22.617	5.8986	1.88	.Q	.	.	.	V .
22.633	5.9012	1.88	.Q	.	.	.	V .
22.650	5.9038	1.88	.Q	.	.	.	V .
22.667	5.9064	1.87	.Q	.	.	.	V .
22.683	5.9090	1.87	.Q	.	.	.	V .
22.700	5.9115	1.87	.Q	.	.	.	V .
22.717	5.9141	1.87	.Q	.	.	.	V .
22.733	5.9167	1.87	.Q	.	.	.	V .
22.750	5.9192	1.86	.Q	.	.	.	V .
22.767	5.9218	1.86	.Q	.	.	.	V .
22.783	5.9244	1.86	.Q	.	.	.	V .
22.800	5.9269	1.86	.Q	.	.	.	V .
22.817	5.9295	1.86	.Q	.	.	.	V .
22.833	5.9320	1.85	.Q	.	.	.	V .
22.850	5.9346	1.85	.Q	.	.	.	V .
22.867	5.9371	1.85	.Q	.	.	.	V .
22.883	5.9397	1.85	.Q	.	.	.	V .
22.900	5.9422	1.85	.Q	.	.	.	V .
22.917	5.9448	1.84	.Q	.	.	.	V .
22.933	5.9473	1.84	.Q	.	.	.	V .
22.950	5.9498	1.84	.Q	.	.	.	V .
22.967	5.9524	1.84	.Q	.	.	.	V .
22.983	5.9549	1.84	.Q	.	.	.	V .
23.000	5.9574	1.83	.Q	.	.	.	V .
23.017	5.9599	1.83	.Q	.	.	.	V .
23.033	5.9625	1.83	.Q	.	.	.	V .
23.050	5.9650	1.83	.Q	.	.	.	V .
23.067	5.9675	1.83	.Q	.	.	.	V .
23.083	5.9700	1.82	.Q	.	.	.	V .
23.100	5.9725	1.82	.Q	.	.	.	V .
23.117	5.9750	1.82	.Q	.	.	.	V.
23.133	5.9775	1.82	.Q	.	.	.	V.
23.150	5.9800	1.82	.Q	.	.	.	V.
23.167	5.9825	1.81	.Q	.	.	.	V.
23.183	5.9850	1.81	.Q	.	.	.	V.
23.200	5.9875	1.81	.Q	.	.	.	V.
23.217	5.9900	1.81	.Q	.	.	.	V.
23.233	5.9925	1.81	.Q	.	.	.	V.
23.250	5.9950	1.80	.Q	.	.	.	V.
23.267	5.9975	1.80	.Q	.	.	.	V.
23.283	5.9999	1.80	.Q	.	.	.	V.
23.300	6.0024	1.80	.Q	.	.	.	V.
23.317	6.0049	1.80	.Q	.	.	.	V.
23.333	6.0074	1.80	.Q	.	.	.	V.
23.350	6.0098	1.79	.Q	.	.	.	V.
23.367	6.0123	1.79	.Q	.	.	.	V.
23.383	6.0148	1.79	.Q	.	.	.	V.
23.400	6.0172	1.79	.Q	.	.	.	V.
23.417	6.0197	1.79	.Q	.	.	.	V.
23.433	6.0222	1.79	.Q	.	.	.	V.
23.450	6.0246	1.78	.Q	.	.	.	V.
23.467	6.0271	1.78	.Q	.	.	.	V.
23.483	6.0295	1.78	.Q	.	.	.	V.
23.500	6.0320	1.78	.Q	.	.	.	V.
23.517	6.0344	1.78	.Q	.	.	.	V.
23.533	6.0369	1.77	.Q	.	.	.	V.
23.550	6.0393	1.77	.Q	.	.	.	V.
23.567	6.0417	1.77	.Q	.	.	.	V.
23.583	6.0442	1.77	.Q	.	.	.	V.
23.600	6.0466	1.77	.Q	.	.	.	V.
23.617	6.0490	1.77	.Q	.	.	.	V.
23.633	6.0515	1.76	.Q	.	.	.	V.
23.650	6.0539	1.76	.Q	.	.	.	V.
23.667	6.0563	1.76	.Q	.	.	.	V.
23.683	6.0588	1.76	.Q	.	.	.	V.
23.700	6.0612	1.76	.Q	.	.	.	V.
23.717	6.0636	1.76	.Q	.	.	.	V.
23.733	6.0660	1.75	.Q	.	.	.	V.
23.750	6.0684	1.75	.Q	.	.	.	V.
23.767	6.0708	1.75	.Q	.	.	.	V.

```
  23.783      6.0732      1.75  .Q        .         .         .        V.
  23.800      6.0756      1.75  .Q        .         .         .        V.
  23.817      6.0781      1.75  .Q        .         .         .        V.
  23.833      6.0805      1.74  .Q        .         .         .        V.
  23.850      6.0829      1.74  .Q        .         .         .        V.
  23.867      6.0853      1.74  .Q        .         .         .        V.
  23.883      6.0876      1.74  .Q        .         .         .        V.
  23.900      6.0900      1.74  .Q        .         .         .        V.
  23.917      6.0924      1.74  .Q        .         .         .        V.
  23.933      6.0948      1.73  .Q        .         .         .        V.
  23.950      6.0972      1.73  .Q        .         .         .        V.
  23.967      6.0996      1.73  .Q        .         .         .        V.
  23.983      6.1020      1.73  .Q        .         .         .        V.
  24.000      6.1044      1.73  .Q        .         .         .        V.
  24.017      6.1067      1.73  .Q        .         .         .        V.
  24.033      6.1091      1.72  .Q        .         .         .        V.
  24.050      6.1115      1.72  .Q        .         .         .        V.
  24.067      6.1138      1.72  .Q        .         .         .        V.
  24.083      6.1162      1.72  .Q        .         .         .        V.
  24.100      6.1185      1.65  .Q        .         .         .        V.
  24.117      6.1205      1.48  .Q        .         .         .        V.
  24.133      6.1223      1.30  .Q        .         .         .        V.
  24.150      6.1239      1.13  .Q        .         .         .        V.
  24.167      6.1252      0.95  Q         .         .         .        V.
  24.183      6.1263      0.78  Q         .         .         .        V.
  24.200      6.1271      0.61  Q         .         .         .        V.
  24.217      6.1277      0.43  Q         .         .         .        V.
  24.233      6.1281      0.26  Q         .         .         .        V.
  24.250      6.1282      0.09  Q         .         .         .         V
--------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1455.0
              10%                            995.0
              20%                            165.0
              30%                             95.0
              40%                             80.0
              50%                             65.0
              60%                             55.0
              70%                             40.0
              80%                             25.0
              90%                             15.0


********************************************************************************
  FLOW PROCESS FROM NODE    226.00 TO NODE    226.00 IS CODE = 3.2
--------------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
================================================================================

                    INFLOW
                   (STREAM 1)
                        |
                        |
                        V                __effective depth
                    -----------          |   (and volume)
                   |           |    |    |
                   |           |    |....V........
                   | detention |<-->|           outflow
                   |   basin   |    |.........._______
                    -----------     |    ^    |  \
                        |           |  dead   |   basin outlet
                        V           | storage |
                     OUTFLOW         ---------
                   (STREAM 1)



          ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
          THROUGH A FLOW-THROUGH DETENTION BASIN
          SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
            DEAD STORAGE(AF) =      0.000
            SPECIFIED DEAD STORAGE(AF) FILLED =      0.000
            SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET =      0.000
```

DETENTION BASIN CONSTANT LOSS RATE(CFS) = 0.00

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	0.10	27.16	0.002
3	0.20	27.29	0.011
4	0.30	27.43	0.033
5	0.40	27.56	0.074
6	0.50	27.69	0.134
7	0.60	27.82	0.218
8	0.70	27.95	0.326
9	0.80	28.08	0.453
10	0.90	28.21	0.598
11	1.00	28.34	0.760
12	1.10	28.46	0.937
13	1.20	28.59	1.129
14	1.30	28.72	1.337
15	1.40	28.84	1.559

==========

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(1-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.017	0.000	0.09	0.00	0.00	0.1	0.000
0.033	0.000	0.27	0.00	0.00	0.3	0.000
0.050	0.000	0.45	0.00	0.00	0.4	0.000
0.067	0.000	0.63	0.00	0.00	0.6	0.000
0.083	0.000	0.80	0.00	0.00	0.8	0.000
0.100	0.000	0.98	0.00	0.00	1.0	0.000
0.117	0.000	1.16	0.00	0.00	1.2	0.000
0.133	0.000	1.34	0.00	0.01	1.3	0.000
0.150	0.000	1.52	0.00	0.01	1.5	0.000
0.167	0.000	1.68	0.00	0.01	1.7	0.000
0.183	0.000	1.72	0.00	0.01	1.7	0.000
0.200	0.000	1.72	0.00	0.01	1.7	0.000
0.217	0.000	1.72	0.00	0.01	1.7	0.000
0.233	0.000	1.72	0.00	0.01	1.7	0.000
0.250	0.000	1.72	0.00	0.01	1.7	0.000
0.267	0.000	1.72	0.00	0.01	1.7	0.000
0.283	0.000	1.72	0.00	0.01	1.7	0.000
0.300	0.000	1.72	0.00	0.01	1.7	0.000
0.317	0.000	1.72	0.00	0.01	1.7	0.000
0.333	0.000	1.72	0.00	0.01	1.7	0.000
0.350	0.000	1.72	0.00	0.01	1.7	0.000
0.367	0.000	1.73	0.00	0.01	1.7	0.000
0.383	0.000	1.73	0.00	0.01	1.7	0.000
0.400	0.000	1.73	0.00	0.01	1.7	0.000
0.417	0.000	1.73	0.00	0.01	1.7	0.000
0.433	0.000	1.73	0.00	0.01	1.7	0.000
0.450	0.000	1.73	0.00	0.01	1.7	0.000
0.467	0.000	1.73	0.00	0.01	1.7	0.000
0.483	0.000	1.73	0.00	0.01	1.7	0.000
0.500	0.000	1.73	0.00	0.01	1.7	0.000
0.517	0.000	1.73	0.00	0.01	1.7	0.000
0.533	0.000	1.73	0.00	0.01	1.7	0.000
0.550	0.000	1.73	0.00	0.01	1.7	0.000
0.567	0.000	1.73	0.00	0.01	1.7	0.000
0.583	0.000	1.73	0.00	0.01	1.7	0.000
0.600	0.000	1.74	0.00	0.01	1.7	0.000
0.617	0.000	1.74	0.00	0.01	1.7	0.000
0.633	0.000	1.74	0.00	0.01	1.7	0.000
0.650	0.000	1.74	0.00	0.01	1.7	0.000
0.667	0.000	1.74	0.00	0.01	1.7	0.000
0.683	0.000	1.74	0.00	0.01	1.7	0.000
0.700	0.000	1.74	0.00	0.01	1.7	0.000
0.717	0.000	1.74	0.00	0.01	1.7	0.000
0.733	0.000	1.74	0.00	0.01	1.7	0.000
0.750	0.000	1.74	0.00	0.01	1.7	0.000
0.767	0.000	1.74	0.00	0.01	1.7	0.000

0.783	0.000	1.74	0.00	0.01	1.7	0.000
0.800	0.000	1.74	0.00	0.01	1.7	0.000
0.817	0.000	1.75	0.00	0.01	1.7	0.000
0.833	0.000	1.75	0.00	0.01	1.7	0.000
0.850	0.000	1.75	0.00	0.01	1.7	0.000
0.867	0.000	1.75	0.00	0.01	1.7	0.000
0.883	0.000	1.75	0.00	0.01	1.7	0.000
0.900	0.000	1.75	0.00	0.01	1.8	0.000
0.917	0.000	1.75	0.00	0.01	1.8	0.000
0.933	0.000	1.75	0.00	0.01	1.8	0.000
0.950	0.000	1.75	0.00	0.01	1.8	0.000
0.967	0.000	1.75	0.00	0.01	1.8	0.000
0.983	0.000	1.76	0.00	0.01	1.8	0.000
1.000	0.000	1.76	0.00	0.01	1.8	0.000
1.017	0.000	1.76	0.00	0.01	1.8	0.000
1.033	0.000	1.76	0.00	0.01	1.8	0.000
1.050	0.000	1.76	0.00	0.01	1.8	0.000
1.067	0.000	1.76	0.00	0.01	1.8	0.000
1.083	0.000	1.76	0.00	0.01	1.8	0.000
1.100	0.000	1.76	0.00	0.01	1.8	0.000
1.117	0.000	1.76	0.00	0.01	1.8	0.000
1.133	0.000	1.76	0.00	0.01	1.8	0.000
1.150	0.000	1.76	0.00	0.01	1.8	0.000
1.167	0.000	1.76	0.00	0.01	1.8	0.000
1.183	0.000	1.76	0.00	0.01	1.8	0.000
1.200	0.000	1.76	0.00	0.01	1.8	0.000
1.217	0.000	1.77	0.00	0.01	1.8	0.000
1.233	0.000	1.77	0.00	0.01	1.8	0.000
1.250	0.000	1.77	0.00	0.01	1.8	0.000
1.267	0.000	1.77	0.00	0.01	1.8	0.000
1.283	0.000	1.77	0.00	0.01	1.8	0.000
1.300	0.000	1.77	0.00	0.01	1.8	0.000
1.317	0.000	1.77	0.00	0.01	1.8	0.000
1.333	0.000	1.77	0.00	0.01	1.8	0.000
1.350	0.000	1.77	0.00	0.01	1.8	0.000
1.367	0.000	1.77	0.00	0.01	1.8	0.000
1.383	0.000	1.78	0.00	0.01	1.8	0.000
1.400	0.000	1.78	0.00	0.01	1.8	0.000
1.417	0.000	1.78	0.00	0.01	1.8	0.000
1.433	0.000	1.78	0.00	0.01	1.8	0.000
1.450	0.000	1.78	0.00	0.01	1.8	0.000
1.467	0.000	1.78	0.00	0.01	1.8	0.000
1.483	0.000	1.78	0.00	0.01	1.8	0.000
1.500	0.000	1.78	0.00	0.01	1.8	0.000
1.517	0.000	1.78	0.00	0.01	1.8	0.000
1.533	0.000	1.78	0.00	0.01	1.8	0.000
1.550	0.000	1.78	0.00	0.01	1.8	0.000
1.567	0.000	1.78	0.00	0.01	1.8	0.000
1.583	0.000	1.79	0.00	0.01	1.8	0.000
1.600	0.000	1.79	0.00	0.01	1.8	0.000
1.617	0.000	1.79	0.00	0.01	1.8	0.000
1.633	0.000	1.79	0.00	0.01	1.8	0.000
1.650	0.000	1.79	0.00	0.01	1.8	0.000
1.667	0.000	1.79	0.00	0.01	1.8	0.000
1.683	0.000	1.79	0.00	0.01	1.8	0.000
1.700	0.000	1.79	0.00	0.01	1.8	0.000
1.717	0.000	1.79	0.00	0.01	1.8	0.000
1.733	0.000	1.79	0.00	0.01	1.8	0.000
1.750	0.000	1.79	0.00	0.01	1.8	0.000
1.767	0.000	1.80	0.00	0.01	1.8	0.000
1.783	0.000	1.80	0.00	0.01	1.8	0.000
1.800	0.000	1.80	0.00	0.01	1.8	0.000
1.817	0.000	1.80	0.00	0.01	1.8	0.000
1.833	0.000	1.80	0.00	0.01	1.8	0.000
1.850	0.000	1.80	0.00	0.01	1.8	0.000
1.867	0.000	1.80	0.00	0.01	1.8	0.000
1.883	0.000	1.80	0.00	0.01	1.8	0.000
1.900	0.000	1.80	0.00	0.01	1.8	0.000
1.917	0.000	1.80	0.00	0.01	1.8	0.000
1.933	0.000	1.81	0.00	0.01	1.8	0.000
1.950	0.000	1.81	0.00	0.01	1.8	0.000
1.967	0.000	1.81	0.00	0.01	1.8	0.000
1.983	0.000	1.81	0.00	0.01	1.8	0.000
2.000	0.000	1.81	0.00	0.01	1.8	0.000
2.017	0.000	1.81	0.00	0.01	1.8	0.000
2.033	0.000	1.81	0.00	0.01	1.8	0.000
2.050	0.000	1.81	0.00	0.01	1.8	0.000
2.067	0.000	1.81	0.00	0.01	1.8	0.000
2.083	0.000	1.81	0.00	0.01	1.8	0.000

2.100	0.000	1.81	0.00	0.01	1.8	0.000
2.117	0.000	1.81	0.00	0.01	1.8	0.000
2.133	0.000	1.81	0.00	0.01	1.8	0.000
2.150	0.000	1.82	0.00	0.01	1.8	0.000
2.167	0.000	1.82	0.00	0.01	1.8	0.000
2.183	0.000	1.82	0.00	0.01	1.8	0.000
2.200	0.000	1.82	0.00	0.01	1.8	0.000
2.217	0.000	1.82	0.00	0.01	1.8	0.000
2.233	0.000	1.82	0.00	0.01	1.8	0.000
2.250	0.000	1.82	0.00	0.01	1.8	0.000
2.267	0.000	1.82	0.00	0.01	1.8	0.000
2.283	0.000	1.83	0.00	0.01	1.8	0.000
2.300	0.000	1.83	0.00	0.01	1.8	0.000
2.317	0.000	1.83	0.00	0.01	1.8	0.000
2.333	0.000	1.83	0.00	0.01	1.8	0.000
2.350	0.000	1.83	0.00	0.01	1.8	0.000
2.367	0.000	1.83	0.00	0.01	1.8	0.000
2.383	0.000	1.83	0.00	0.01	1.8	0.000
2.400	0.000	1.83	0.00	0.01	1.8	0.000
2.417	0.000	1.83	0.00	0.01	1.8	0.000
2.433	0.000	1.83	0.00	0.01	1.8	0.000
2.450	0.000	1.83	0.00	0.01	1.8	0.000
2.467	0.000	1.83	0.00	0.01	1.8	0.000
2.483	0.000	1.83	0.00	0.01	1.8	0.000
2.500	0.000	1.84	0.00	0.01	1.8	0.000
2.517	0.000	1.84	0.00	0.01	1.8	0.000
2.533	0.000	1.84	0.00	0.01	1.8	0.000
2.550	0.000	1.84	0.00	0.01	1.8	0.000
2.567	0.000	1.84	0.00	0.01	1.8	0.000
2.583	0.000	1.84	0.00	0.01	1.8	0.000
2.600	0.000	1.84	0.00	0.01	1.8	0.000
2.617	0.000	1.85	0.00	0.01	1.8	0.000
2.633	0.000	1.85	0.00	0.01	1.8	0.000
2.650	0.000	1.85	0.00	0.01	1.8	0.000
2.667	0.000	1.85	0.00	0.01	1.8	0.000
2.683	0.000	1.85	0.00	0.01	1.8	0.000
2.700	0.000	1.85	0.00	0.01	1.8	0.000
2.717	0.000	1.85	0.00	0.01	1.9	0.000
2.733	0.000	1.85	0.00	0.01	1.9	0.000
2.750	0.000	1.85	0.00	0.01	1.9	0.000
2.767	0.000	1.85	0.00	0.01	1.9	0.000
2.783	0.000	1.85	0.00	0.01	1.9	0.000
2.800	0.000	1.85	0.00	0.01	1.9	0.000
2.817	0.000	1.85	0.00	0.01	1.9	0.000
2.833	0.000	1.86	0.00	0.01	1.9	0.000
2.850	0.000	1.86	0.00	0.01	1.9	0.000
2.867	0.000	1.86	0.00	0.01	1.9	0.000
2.883	0.000	1.86	0.00	0.01	1.9	0.000
2.900	0.000	1.86	0.00	0.01	1.9	0.000
2.917	0.000	1.86	0.00	0.01	1.9	0.000
2.933	0.000	1.86	0.00	0.01	1.9	0.000
2.950	0.000	1.87	0.00	0.01	1.9	0.000
2.967	0.000	1.87	0.00	0.01	1.9	0.000
2.983	0.000	1.87	0.00	0.01	1.9	0.000
3.000	0.000	1.87	0.00	0.01	1.9	0.000
3.017	0.000	1.87	0.00	0.01	1.9	0.000
3.033	0.000	1.87	0.00	0.01	1.9	0.000
3.050	0.000	1.87	0.00	0.01	1.9	0.000
3.067	0.000	1.87	0.00	0.01	1.9	0.000
3.083	0.000	1.87	0.00	0.01	1.9	0.000
3.100	0.000	1.87	0.00	0.01	1.9	0.000
3.117	0.000	1.87	0.00	0.01	1.9	0.000
3.133	0.000	1.87	0.00	0.01	1.9	0.000
3.150	0.000	1.88	0.00	0.01	1.9	0.000
3.167	0.000	1.88	0.00	0.01	1.9	0.000
3.183	0.000	1.88	0.00	0.01	1.9	0.000
3.200	0.000	1.88	0.00	0.01	1.9	0.000
3.217	0.000	1.88	0.00	0.01	1.9	0.000
3.233	0.000	1.88	0.00	0.01	1.9	0.000
3.250	0.000	1.88	0.00	0.01	1.9	0.000
3.267	0.000	1.88	0.00	0.01	1.9	0.000
3.283	0.000	1.89	0.00	0.01	1.9	0.000
3.300	0.000	1.89	0.00	0.01	1.9	0.000
3.317	0.000	1.89	0.00	0.01	1.9	0.000
3.333	0.000	1.89	0.00	0.01	1.9	0.000
3.350	0.000	1.89	0.00	0.01	1.9	0.000
3.367	0.000	1.89	0.00	0.01	1.9	0.000
3.383	0.000	1.89	0.00	0.01	1.9	0.000
3.400	0.000	1.89	0.00	0.01	1.9	0.000

3.417	0.000	1.89	0.00	0.01	1.9	0.000
3.433	0.000	1.89	0.00	0.01	1.9	0.000
3.450	0.000	1.89	0.00	0.01	1.9	0.000
3.467	0.000	1.90	0.00	0.01	1.9	0.000
3.483	0.000	1.90	0.00	0.01	1.9	0.000
3.500	0.000	1.90	0.00	0.01	1.9	0.000
3.517	0.000	1.90	0.00	0.01	1.9	0.000
3.533	0.000	1.90	0.00	0.01	1.9	0.000
3.550	0.000	1.90	0.00	0.01	1.9	0.000
3.567	0.000	1.90	0.00	0.01	1.9	0.000
3.583	0.000	1.91	0.00	0.01	1.9	0.000
3.600	0.000	1.91	0.00	0.01	1.9	0.000
3.617	0.000	1.91	0.00	0.01	1.9	0.000
3.633	0.000	1.91	0.00	0.01	1.9	0.000
3.650	0.000	1.91	0.00	0.01	1.9	0.000
3.667	0.000	1.91	0.00	0.01	1.9	0.000
3.683	0.000	1.91	0.00	0.01	1.9	0.000
3.700	0.000	1.91	0.00	0.01	1.9	0.000
3.717	0.000	1.91	0.00	0.01	1.9	0.000
3.733	0.000	1.91	0.00	0.01	1.9	0.000
3.750	0.000	1.91	0.00	0.01	1.9	0.000
3.767	0.000	1.92	0.00	0.01	1.9	0.000
3.783	0.000	1.92	0.00	0.01	1.9	0.000
3.800	0.000	1.92	0.00	0.01	1.9	0.000
3.817	0.000	1.92	0.00	0.01	1.9	0.000
3.833	0.000	1.92	0.00	0.01	1.9	0.000
3.850	0.000	1.92	0.00	0.01	1.9	0.000
3.867	0.000	1.92	0.00	0.01	1.9	0.000
3.883	0.000	1.92	0.00	0.01	1.9	0.000
3.900	0.000	1.93	0.00	0.01	1.9	0.000
3.917	0.000	1.93	0.00	0.01	1.9	0.000
3.933	0.000	1.93	0.00	0.01	1.9	0.000
3.950	0.000	1.93	0.00	0.01	1.9	0.000
3.967	0.000	1.93	0.00	0.01	1.9	0.000
3.983	0.000	1.93	0.00	0.01	1.9	0.000
4.000	0.000	1.93	0.00	0.01	1.9	0.000
4.017	0.000	1.93	0.00	0.01	1.9	0.000
4.033	0.000	1.94	0.00	0.01	1.9	0.000
4.050	0.000	1.94	0.00	0.01	1.9	0.000
4.067	0.000	1.94	0.00	0.01	1.9	0.000
4.083	0.000	1.94	0.00	0.01	1.9	0.000
4.100	0.000	1.94	0.00	0.01	1.9	0.000
4.117	0.000	1.94	0.00	0.01	1.9	0.000
4.133	0.000	1.94	0.00	0.01	1.9	0.000
4.150	0.000	1.94	0.00	0.01	1.9	0.000
4.167	0.000	1.94	0.00	0.01	1.9	0.000
4.183	0.000	1.94	0.00	0.01	1.9	0.000
4.200	0.000	1.95	0.00	0.01	1.9	0.000
4.217	0.000	1.95	0.00	0.01	1.9	0.000
4.233	0.000	1.95	0.00	0.01	1.9	0.000
4.250	0.000	1.95	0.00	0.01	2.0	0.000
4.267	0.000	1.95	0.00	0.01	2.0	0.000
4.283	0.000	1.95	0.00	0.01	2.0	0.000
4.300	0.000	1.96	0.00	0.01	2.0	0.000
4.317	0.000	1.96	0.00	0.01	2.0	0.000
4.333	0.000	1.96	0.00	0.01	2.0	0.000
4.350	0.000	1.96	0.00	0.01	2.0	0.000
4.367	0.000	1.96	0.00	0.01	2.0	0.000
4.383	0.000	1.96	0.00	0.01	2.0	0.000
4.400	0.000	1.96	0.00	0.01	2.0	0.000
4.417	0.000	1.96	0.00	0.01	2.0	0.000
4.433	0.000	1.96	0.00	0.01	2.0	0.000
4.450	0.000	1.96	0.00	0.01	2.0	0.000
4.467	0.000	1.96	0.00	0.01	2.0	0.000
4.483	0.000	1.97	0.00	0.01	2.0	0.000
4.500	0.000	1.97	0.00	0.01	2.0	0.000
4.517	0.000	1.97	0.00	0.01	2.0	0.000
4.533	0.000	1.97	0.00	0.01	2.0	0.000
4.550	0.000	1.97	0.00	0.01	2.0	0.000
4.567	0.000	1.97	0.00	0.01	2.0	0.000
4.583	0.000	1.98	0.00	0.01	2.0	0.000
4.600	0.000	1.98	0.00	0.01	2.0	0.000
4.617	0.000	1.98	0.00	0.01	2.0	0.000
4.633	0.000	1.98	0.00	0.01	2.0	0.000
4.650	0.000	1.98	0.00	0.01	2.0	0.000
4.667	0.000	1.98	0.00	0.01	2.0	0.000
4.683	0.000	1.98	0.00	0.01	2.0	0.000
4.700	0.000	1.98	0.00	0.01	2.0	0.000
4.717	0.000	1.98	0.00	0.01	2.0	0.000

4.733	0.000	1.99	0.00	0.01	2.0	0.000
4.750	0.000	1.99	0.00	0.01	2.0	0.000
4.767	0.000	1.99	0.00	0.01	2.0	0.000
4.783	0.000	1.99	0.00	0.01	2.0	0.000
4.800	0.000	1.99	0.00	0.01	2.0	0.000
4.817	0.000	1.99	0.00	0.01	2.0	0.000
4.833	0.000	1.99	0.00	0.01	2.0	0.000
4.850	0.000	1.99	0.00	0.01	2.0	0.000
4.867	0.000	2.00	0.00	0.01	2.0	0.000
4.883	0.000	2.00	0.00	0.01	2.0	0.000
4.900	0.000	2.00	0.00	0.01	2.0	0.000
4.917	0.000	2.00	0.00	0.01	2.0	0.000
4.933	0.000	2.00	0.00	0.01	2.0	0.000
4.950	0.000	2.00	0.00	0.01	2.0	0.000
4.967	0.000	2.01	0.00	0.01	2.0	0.000
4.983	0.000	2.01	0.00	0.01	2.0	0.000
5.000	0.000	2.01	0.00	0.01	2.0	0.000
5.017	0.000	2.01	0.00	0.01	2.0	0.000
5.033	0.000	2.01	0.00	0.01	2.0	0.000
5.050	0.000	2.01	0.00	0.01	2.0	0.000
5.067	0.000	2.01	0.00	0.01	2.0	0.000
5.083	0.000	2.01	0.00	0.01	2.0	0.000
5.100	0.000	2.01	0.00	0.01	2.0	0.000
5.117	0.000	2.01	0.00	0.01	2.0	0.000
5.133	0.000	2.02	0.00	0.01	2.0	0.000
5.150	0.000	2.02	0.00	0.01	2.0	0.000
5.167	0.000	2.02	0.00	0.01	2.0	0.000
5.183	0.000	2.02	0.00	0.01	2.0	0.000
5.200	0.000	2.02	0.00	0.01	2.0	0.000
5.217	0.000	2.02	0.00	0.01	2.0	0.000
5.233	0.000	2.03	0.00	0.01	2.0	0.000
5.250	0.000	2.03	0.00	0.01	2.0	0.000
5.267	0.000	2.03	0.00	0.01	2.0	0.000
5.283	0.000	2.03	0.00	0.01	2.0	0.000
5.300	0.000	2.03	0.00	0.01	2.0	0.000
5.317	0.000	2.03	0.00	0.01	2.0	0.000
5.333	0.000	2.03	0.00	0.01	2.0	0.000
5.350	0.000	2.03	0.00	0.01	2.0	0.000
5.367	0.000	2.04	0.00	0.01	2.0	0.000
5.383	0.000	2.04	0.00	0.01	2.0	0.000
5.400	0.000	2.04	0.00	0.01	2.0	0.000
5.417	0.000	2.04	0.00	0.01	2.0	0.000
5.433	0.000	2.04	0.00	0.01	2.0	0.000
5.450	0.000	2.04	0.00	0.01	2.0	0.000
5.467	0.000	2.04	0.00	0.01	2.0	0.000
5.483	0.000	2.04	0.00	0.01	2.0	0.000
5.500	0.000	2.05	0.00	0.01	2.0	0.000
5.517	0.000	2.05	0.00	0.01	2.0	0.000
5.533	0.000	2.05	0.00	0.01	2.0	0.000
5.550	0.000	2.05	0.00	0.01	2.1	0.000
5.567	0.000	2.05	0.00	0.01	2.1	0.000
5.583	0.000	2.06	0.00	0.01	2.1	0.000
5.600	0.000	2.06	0.00	0.01	2.1	0.000
5.617	0.000	2.06	0.00	0.01	2.1	0.000
5.633	0.000	2.06	0.00	0.01	2.1	0.000
5.650	0.000	2.06	0.00	0.01	2.1	0.000
5.667	0.000	2.06	0.00	0.01	2.1	0.000
5.683	0.000	2.06	0.00	0.01	2.1	0.000
5.700	0.000	2.06	0.00	0.01	2.1	0.000
5.717	0.000	2.06	0.00	0.01	2.1	0.000
5.733	0.000	2.07	0.00	0.01	2.1	0.000
5.750	0.000	2.07	0.00	0.01	2.1	0.000
5.767	0.000	2.07	0.00	0.01	2.1	0.000
5.783	0.000	2.07	0.00	0.01	2.1	0.000
5.800	0.000	2.07	0.00	0.01	2.1	0.000
5.817	0.000	2.07	0.00	0.01	2.1	0.000
5.833	0.000	2.07	0.00	0.01	2.1	0.000
5.850	0.000	2.08	0.00	0.01	2.1	0.000
5.867	0.000	2.08	0.00	0.01	2.1	0.000
5.883	0.000	2.08	0.00	0.01	2.1	0.000
5.900	0.000	2.08	0.00	0.01	2.1	0.000
5.917	0.000	2.08	0.00	0.01	2.1	0.000
5.933	0.000	2.09	0.00	0.01	2.1	0.000
5.950	0.000	2.09	0.00	0.01	2.1	0.000
5.967	0.000	2.09	0.00	0.01	2.1	0.000
5.983	0.000	2.09	0.00	0.01	2.1	0.000
6.000	0.000	2.09	0.00	0.01	2.1	0.000
6.017	0.000	2.09	0.00	0.01	2.1	0.000
6.033	0.000	2.09	0.00	0.01	2.1	0.000

6.050	0.000	2.09	0.00	0.01	2.1	0.000
6.067	0.000	2.09	0.00	0.01	2.1	0.000
6.083	0.000	2.10	0.00	0.01	2.1	0.000
6.100	0.000	2.10	0.00	0.01	2.1	0.000
6.117	0.000	2.10	0.00	0.01	2.1	0.000
6.133	0.000	2.10	0.00	0.01	2.1	0.000
6.150	0.000	2.10	0.00	0.01	2.1	0.000
6.167	0.000	2.10	0.00	0.01	2.1	0.000
6.183	0.000	2.11	0.00	0.01	2.1	0.000
6.200	0.000	2.11	0.00	0.01	2.1	0.000
6.217	0.000	2.11	0.00	0.01	2.1	0.000
6.233	0.000	2.11	0.00	0.01	2.1	0.000
6.250	0.000	2.11	0.00	0.01	2.1	0.000
6.267	0.000	2.12	0.00	0.01	2.1	0.000
6.283	0.000	2.12	0.00	0.01	2.1	0.000
6.300	0.000	2.12	0.00	0.01	2.1	0.000
6.317	0.000	2.12	0.00	0.01	2.1	0.000
6.333	0.000	2.12	0.00	0.01	2.1	0.000
6.350	0.000	2.12	0.00	0.01	2.1	0.000
6.367	0.000	2.12	0.00	0.01	2.1	0.000
6.383	0.000	2.12	0.00	0.01	2.1	0.000
6.400	0.000	2.13	0.00	0.01	2.1	0.000
6.417	0.000	2.13	0.00	0.01	2.1	0.000
6.433	0.000	2.13	0.00	0.01	2.1	0.000
6.450	0.000	2.13	0.00	0.01	2.1	0.000
6.467	0.000	2.13	0.00	0.01	2.1	0.000
6.483	0.000	2.13	0.00	0.01	2.1	0.000
6.500	0.000	2.14	0.00	0.01	2.1	0.000
6.517	0.000	2.14	0.00	0.01	2.1	0.000
6.533	0.000	2.14	0.00	0.01	2.1	0.000
6.550	0.000	2.14	0.00	0.01	2.1	0.000
6.567	0.000	2.14	0.00	0.01	2.1	0.000
6.583	0.000	2.15	0.00	0.01	2.1	0.000
6.600	0.000	2.15	0.00	0.01	2.1	0.000
6.617	0.000	2.15	0.00	0.01	2.2	0.000
6.633	0.000	2.15	0.00	0.01	2.2	0.000
6.650	0.000	2.15	0.00	0.01	2.2	0.000
6.667	0.000	2.15	0.00	0.01	2.2	0.000
6.683	0.000	2.15	0.00	0.01	2.2	0.000
6.700	0.000	2.16	0.00	0.01	2.2	0.000
6.717	0.000	2.16	0.00	0.01	2.2	0.000
6.733	0.000	2.16	0.00	0.01	2.2	0.000
6.750	0.000	2.16	0.00	0.01	2.2	0.000
6.767	0.000	2.16	0.00	0.01	2.2	0.000
6.783	0.000	2.16	0.00	0.01	2.2	0.000
6.800	0.000	2.16	0.00	0.01	2.2	0.000
6.817	0.000	2.17	0.00	0.01	2.2	0.000
6.833	0.000	2.17	0.00	0.01	2.2	0.000
6.850	0.000	2.17	0.00	0.01	2.2	0.000
6.867	0.000	2.17	0.00	0.01	2.2	0.000
6.883	0.000	2.18	0.00	0.01	2.2	0.000
6.900	0.000	2.18	0.00	0.01	2.2	0.000
6.917	0.000	2.18	0.00	0.01	2.2	0.000
6.933	0.000	2.18	0.00	0.01	2.2	0.000
6.950	0.000	2.18	0.00	0.01	2.2	0.000
6.967	0.000	2.19	0.00	0.01	2.2	0.000
6.983	0.000	2.19	0.00	0.01	2.2	0.000
7.000	0.000	2.19	0.00	0.01	2.2	0.000
7.017	0.000	2.19	0.00	0.01	2.2	0.000
7.033	0.000	2.19	0.00	0.01	2.2	0.000
7.050	0.000	2.19	0.00	0.01	2.2	0.000
7.067	0.000	2.19	0.00	0.01	2.2	0.000
7.083	0.000	2.19	0.00	0.01	2.2	0.000
7.100	0.000	2.19	0.00	0.01	2.2	0.000
7.117	0.000	2.20	0.00	0.01	2.2	0.000
7.133	0.000	2.20	0.00	0.01	2.2	0.000
7.150	0.000	2.20	0.00	0.01	2.2	0.000
7.167	0.000	2.20	0.00	0.01	2.2	0.000
7.183	0.000	2.21	0.00	0.01	2.2	0.000
7.200	0.000	2.21	0.00	0.01	2.2	0.000
7.217	0.000	2.21	0.00	0.01	2.2	0.000
7.233	0.000	2.21	0.00	0.01	2.2	0.000
7.250	0.000	2.22	0.00	0.01	2.2	0.000
7.267	0.000	2.22	0.00	0.01	2.2	0.000
7.283	0.000	2.22	0.00	0.01	2.2	0.000
7.300	0.000	2.22	0.00	0.01	2.2	0.000
7.317	0.000	2.22	0.00	0.01	2.2	0.000
7.333	0.000	2.22	0.00	0.01	2.2	0.000
7.350	0.000	2.22	0.00	0.01	2.2	0.000

7.367	0.000	2.23	0.00	0.01	2.2	0.000
7.383	0.000	2.23	0.00	0.01	2.2	0.000
7.400	0.000	2.23	0.00	0.01	2.2	0.000
7.417	0.000	2.23	0.00	0.01	2.2	0.000
7.433	0.000	2.23	0.00	0.01	2.2	0.000
7.450	0.000	2.23	0.00	0.01	2.2	0.000
7.467	0.000	2.24	0.00	0.01	2.2	0.000
7.483	0.000	2.24	0.00	0.01	2.2	0.000
7.500	0.000	2.24	0.00	0.01	2.2	0.000
7.517	0.000	2.24	0.00	0.01	2.2	0.000
7.533	0.000	2.25	0.00	0.01	2.2	0.000
7.550	0.000	2.25	0.00	0.01	2.2	0.000
7.567	0.000	2.25	0.00	0.01	2.3	0.000
7.583	0.000	2.25	0.00	0.01	2.3	0.000
7.600	0.000	2.26	0.00	0.01	2.3	0.000
7.617	0.000	2.26	0.00	0.01	2.3	0.000
7.633	0.000	2.26	0.00	0.01	2.3	0.000
7.650	0.000	2.26	0.00	0.01	2.3	0.000
7.667	0.000	2.26	0.00	0.01	2.3	0.000
7.683	0.000	2.26	0.00	0.01	2.3	0.000
7.700	0.000	2.26	0.00	0.01	2.3	0.000
7.717	0.000	2.26	0.00	0.01	2.3	0.000
7.733	0.000	2.27	0.00	0.01	2.3	0.000
7.750	0.000	2.27	0.00	0.01	2.3	0.000
7.767	0.000	2.27	0.00	0.01	2.3	0.000
7.783	0.000	2.27	0.00	0.01	2.3	0.000
7.800	0.000	2.27	0.00	0.01	2.3	0.000
7.817	0.000	2.28	0.00	0.01	2.3	0.000
7.833	0.000	2.28	0.00	0.01	2.3	0.000
7.850	0.000	2.28	0.00	0.01	2.3	0.000
7.867	0.000	2.28	0.00	0.01	2.3	0.000
7.883	0.000	2.29	0.00	0.01	2.3	0.000
7.900	0.000	2.29	0.00	0.01	2.3	0.000
7.917	0.000	2.29	0.00	0.01	2.3	0.000
7.933	0.000	2.29	0.00	0.01	2.3	0.000
7.950	0.000	2.30	0.00	0.01	2.3	0.000
7.967	0.000	2.30	0.00	0.01	2.3	0.000
7.983	0.000	2.30	0.00	0.01	2.3	0.000
8.000	0.000	2.30	0.00	0.01	2.3	0.000
8.017	0.000	2.30	0.00	0.01	2.3	0.000
8.033	0.000	2.30	0.00	0.01	2.3	0.000
8.050	0.000	2.30	0.00	0.01	2.3	0.000
8.067	0.000	2.31	0.00	0.01	2.3	0.000
8.083	0.000	2.31	0.00	0.01	2.3	0.000
8.100	0.000	2.31	0.00	0.01	2.3	0.000
8.117	0.000	2.31	0.00	0.01	2.3	0.000
8.133	0.000	2.32	0.00	0.01	2.3	0.000
8.150	0.000	2.32	0.00	0.01	2.3	0.000
8.167	0.000	2.32	0.00	0.01	2.3	0.000
8.183	0.000	2.32	0.00	0.01	2.3	0.000
8.200	0.000	2.33	0.00	0.01	2.3	0.000
8.217	0.000	2.33	0.00	0.01	2.3	0.000
8.233	0.000	2.33	0.00	0.01	2.3	0.000
8.250	0.000	2.33	0.00	0.01	2.3	0.000
8.267	0.000	2.34	0.00	0.01	2.3	0.000
8.283	0.000	2.34	0.00	0.01	2.3	0.000
8.300	0.000	2.34	0.00	0.01	2.3	0.000
8.317	0.000	2.34	0.00	0.01	2.3	0.000
8.333	0.000	2.34	0.00	0.01	2.3	0.000
8.350	0.000	2.34	0.00	0.01	2.3	0.000
8.367	0.000	2.35	0.00	0.01	2.3	0.000
8.383	0.000	2.35	0.00	0.01	2.3	0.000
8.400	0.000	2.35	0.00	0.01	2.3	0.000
8.417	0.000	2.35	0.00	0.01	2.3	0.000
8.433	0.000	2.35	0.00	0.01	2.4	0.000
8.450	0.000	2.36	0.00	0.01	2.4	0.000
8.467	0.000	2.36	0.00	0.01	2.4	0.000
8.483	0.000	2.36	0.00	0.01	2.4	0.000
8.500	0.000	2.36	0.00	0.01	2.4	0.000
8.517	0.000	2.37	0.00	0.01	2.4	0.000
8.533	0.000	2.37	0.00	0.01	2.4	0.000
8.550	0.000	2.37	0.00	0.01	2.4	0.000
8.567	0.000	2.38	0.00	0.01	2.4	0.000
8.583	0.000	2.38	0.00	0.01	2.4	0.000
8.600	0.000	2.38	0.00	0.01	2.4	0.000
8.617	0.000	2.38	0.00	0.01	2.4	0.000
8.633	0.000	2.38	0.00	0.01	2.4	0.000
8.650	0.000	2.39	0.00	0.01	2.4	0.000
8.667	0.000	2.39	0.00	0.01	2.4	0.000

8.683	0.000	2.39	0.00	0.01	2.4	0.000
8.700	0.000	2.39	0.00	0.01	2.4	0.000
8.717	0.000	2.39	0.00	0.01	2.4	0.000
8.733	0.000	2.39	0.00	0.01	2.4	0.000
8.750	0.000	2.40	0.00	0.01	2.4	0.000
8.767	0.000	2.40	0.00	0.01	2.4	0.000
8.783	0.000	2.40	0.00	0.01	2.4	0.000
8.800	0.000	2.40	0.00	0.01	2.4	0.000
8.817	0.000	2.41	0.00	0.01	2.4	0.000
8.833	0.000	2.41	0.00	0.01	2.4	0.000
8.850	0.000	2.41	0.00	0.01	2.4	0.000
8.867	0.000	2.42	0.00	0.01	2.4	0.000
8.883	0.000	2.42	0.00	0.01	2.4	0.000
8.900	0.000	2.42	0.00	0.01	2.4	0.000
8.917	0.000	2.43	0.00	0.01	2.4	0.000
8.933	0.000	2.43	0.00	0.01	2.4	0.000
8.950	0.000	2.43	0.00	0.01	2.4	0.000
8.967	0.000	2.43	0.00	0.01	2.4	0.000
8.983	0.000	2.43	0.00	0.01	2.4	0.000
9.000	0.000	2.43	0.00	0.01	2.4	0.000
9.017	0.000	2.44	0.00	0.01	2.4	0.000
9.033	0.000	2.44	0.00	0.01	2.4	0.000
9.050	0.000	2.44	0.00	0.01	2.4	0.000
9.067	0.000	2.44	0.00	0.01	2.4	0.000
9.083	0.000	2.44	0.00	0.01	2.4	0.000
9.100	0.000	2.45	0.00	0.01	2.4	0.000
9.117	0.000	2.45	0.00	0.01	2.5	0.000
9.133	0.000	2.45	0.00	0.01	2.5	0.000
9.150	0.000	2.46	0.00	0.01	2.5	0.000
9.167	0.000	2.46	0.00	0.01	2.5	0.000
9.183	0.000	2.46	0.00	0.01	2.5	0.000
9.200	0.000	2.47	0.00	0.01	2.5	0.000
9.217	0.000	2.47	0.00	0.01	2.5	0.000
9.233	0.000	2.47	0.00	0.01	2.5	0.000
9.250	0.000	2.48	0.00	0.01	2.5	0.000
9.267	0.000	2.48	0.00	0.01	2.5	0.000
9.283	0.000	2.48	0.00	0.01	2.5	0.000
9.300	0.000	2.48	0.00	0.01	2.5	0.000
9.317	0.000	2.48	0.00	0.01	2.5	0.000
9.333	0.000	2.49	0.00	0.01	2.5	0.000
9.350	0.000	2.49	0.00	0.01	2.5	0.000
9.367	0.000	2.49	0.00	0.01	2.5	0.000
9.383	0.000	2.49	0.00	0.01	2.5	0.000
9.400	0.000	2.49	0.00	0.01	2.5	0.000
9.417	0.000	2.50	0.00	0.01	2.5	0.000
9.433	0.000	2.50	0.00	0.01	2.5	0.000
9.450	0.000	2.50	0.00	0.01	2.5	0.000
9.467	0.000	2.51	0.00	0.01	2.5	0.000
9.483	0.000	2.51	0.00	0.01	2.5	0.000
9.500	0.000	2.51	0.00	0.01	2.5	0.000
9.517	0.000	2.52	0.00	0.01	2.5	0.000
9.533	0.000	2.52	0.00	0.01	2.5	0.000
9.550	0.000	2.52	0.00	0.01	2.5	0.000
9.567	0.000	2.53	0.00	0.01	2.5	0.000
9.583	0.000	2.53	0.00	0.01	2.5	0.000
9.600	0.000	2.53	0.00	0.01	2.5	0.000
9.617	0.000	2.53	0.00	0.01	2.5	0.000
9.633	0.000	2.54	0.00	0.01	2.5	0.000
9.650	0.000	2.54	0.00	0.01	2.5	0.000
9.667	0.000	2.54	0.00	0.01	2.5	0.000
9.683	0.000	2.54	0.00	0.01	2.5	0.000
9.700	0.000	2.54	0.00	0.01	2.5	0.000
9.717	0.000	2.55	0.00	0.01	2.5	0.000
9.733	0.000	2.55	0.00	0.01	2.5	0.000
9.750	0.000	2.55	0.00	0.01	2.6	0.000
9.767	0.000	2.56	0.00	0.01	2.6	0.000
9.783	0.000	2.56	0.00	0.01	2.6	0.000
9.800	0.000	2.56	0.00	0.01	2.6	0.000
9.817	0.000	2.57	0.00	0.01	2.6	0.000
9.833	0.000	2.57	0.00	0.01	2.6	0.000
9.850	0.000	2.58	0.00	0.01	2.6	0.000
9.867	0.000	2.58	0.00	0.01	2.6	0.000
9.883	0.000	2.58	0.00	0.01	2.6	0.000
9.900	0.000	2.59	0.00	0.01	2.6	0.000
9.917	0.000	2.59	0.00	0.01	2.6	0.000
9.933	0.000	2.59	0.00	0.01	2.6	0.000
9.950	0.000	2.59	0.00	0.01	2.6	0.000
9.967	0.000	2.60	0.00	0.01	2.6	0.000
9.983	0.000	2.60	0.00	0.01	2.6	0.000

10.000	0.000	2.60	0.00	0.01	2.6	0.000
10.017	0.000	2.60	0.00	0.01	2.6	0.000
10.033	0.000	2.60	0.00	0.01	2.6	0.000
10.050	0.000	2.61	0.00	0.01	2.6	0.000
10.067	0.000	2.61	0.00	0.01	2.6	0.000
10.083	0.000	2.61	0.00	0.01	2.6	0.000
10.100	0.000	2.62	0.00	0.01	2.6	0.000
10.117	0.000	2.62	0.00	0.01	2.6	0.000
10.133	0.000	2.62	0.00	0.01	2.6	0.000
10.150	0.000	2.63	0.00	0.01	2.6	0.000
10.167	0.000	2.63	0.00	0.01	2.6	0.000
10.183	0.000	2.64	0.00	0.01	2.6	0.000
10.200	0.000	2.64	0.00	0.01	2.6	0.000
10.217	0.000	2.65	0.00	0.01	2.6	0.000
10.233	0.000	2.65	0.00	0.01	2.6	0.000
10.250	0.000	2.65	0.00	0.01	2.7	0.000
10.267	0.000	2.65	0.00	0.01	2.7	0.000
10.283	0.000	2.66	0.00	0.01	2.7	0.000
10.300	0.000	2.66	0.00	0.01	2.7	0.000
10.317	0.000	2.66	0.00	0.01	2.7	0.000
10.333	0.000	2.66	0.00	0.01	2.7	0.000
10.350	0.000	2.67	0.00	0.01	2.7	0.000
10.367	0.000	2.67	0.00	0.01	2.7	0.000
10.383	0.000	2.67	0.00	0.01	2.7	0.000
10.400	0.000	2.67	0.00	0.01	2.7	0.000
10.417	0.000	2.68	0.00	0.01	2.7	0.000
10.433	0.000	2.68	0.00	0.01	2.7	0.000
10.450	0.000	2.69	0.00	0.01	2.7	0.000
10.467	0.000	2.69	0.00	0.01	2.7	0.000
10.483	0.000	2.70	0.00	0.01	2.7	0.000
10.500	0.000	2.70	0.00	0.01	2.7	0.000
10.517	0.000	2.70	0.00	0.01	2.7	0.000
10.533	0.000	2.71	0.00	0.01	2.7	0.000
10.550	0.000	2.71	0.00	0.01	2.7	0.000
10.567	0.000	2.72	0.00	0.01	2.7	0.000
10.583	0.000	2.72	0.00	0.01	2.7	0.000
10.600	0.000	2.72	0.00	0.01	2.7	0.000
10.617	0.000	2.73	0.00	0.01	2.7	0.000
10.633	0.000	2.73	0.00	0.01	2.7	0.000
10.650	0.000	2.73	0.00	0.01	2.7	0.000
10.667	0.000	2.73	0.00	0.01	2.7	0.000
10.683	0.000	2.73	0.00	0.01	2.7	0.000
10.700	0.000	2.74	0.00	0.01	2.7	0.000
10.717	0.000	2.74	0.00	0.01	2.7	0.000
10.733	0.000	2.74	0.00	0.01	2.7	0.000
10.750	0.000	2.75	0.00	0.01	2.7	0.000
10.767	0.000	2.75	0.00	0.01	2.8	0.000
10.783	0.000	2.76	0.00	0.01	2.8	0.000
10.800	0.000	2.76	0.00	0.01	2.8	0.000
10.817	0.000	2.77	0.00	0.01	2.8	0.000
10.833	0.000	2.77	0.00	0.01	2.8	0.000
10.850	0.000	2.78	0.00	0.01	2.8	0.000
10.867	0.000	2.78	0.00	0.01	2.8	0.000
10.883	0.000	2.79	0.00	0.01	2.8	0.000
10.900	0.000	2.79	0.00	0.01	2.8	0.000
10.917	0.000	2.79	0.00	0.01	2.8	0.000
10.933	0.000	2.80	0.00	0.01	2.8	0.000
10.950	0.000	2.80	0.00	0.01	2.8	0.000
10.967	0.000	2.80	0.00	0.01	2.8	0.000
10.983	0.000	2.81	0.00	0.01	2.8	0.000
11.000	0.000	2.81	0.00	0.01	2.8	0.000
11.017	0.000	2.81	0.00	0.01	2.8	0.000
11.033	0.000	2.81	0.00	0.01	2.8	0.000
11.050	0.000	2.82	0.00	0.01	2.8	0.000
11.067	0.000	2.82	0.00	0.01	2.8	0.000
11.083	0.000	2.83	0.00	0.01	2.8	0.000
11.100	0.000	2.83	0.00	0.01	2.8	0.000
11.117	0.000	2.84	0.00	0.01	2.8	0.000
11.133	0.000	2.84	0.00	0.01	2.8	0.000
11.150	0.000	2.85	0.00	0.01	2.8	0.000
11.167	0.000	2.85	0.00	0.01	2.9	0.000
11.183	0.000	2.86	0.00	0.01	2.9	0.000
11.200	0.000	2.86	0.00	0.01	2.9	0.000
11.217	0.000	2.87	0.00	0.01	2.9	0.000
11.233	0.000	2.87	0.00	0.01	2.9	0.000
11.250	0.000	2.88	0.00	0.01	2.9	0.000
11.267	0.000	2.88	0.00	0.01	2.9	0.000
11.283	0.000	2.88	0.00	0.01	2.9	0.000
11.300	0.000	2.88	0.00	0.01	2.9	0.000

11.317	0.000	2.89	0.00	0.01	2.9	0.000
11.333	0.000	2.89	0.00	0.01	2.9	0.000
11.350	0.000	2.89	0.00	0.01	2.9	0.000
11.367	0.000	2.90	0.00	0.01	2.9	0.000
11.383	0.000	2.90	0.00	0.01	2.9	0.000
11.400	0.000	2.90	0.00	0.01	2.9	0.000
11.417	0.000	2.91	0.00	0.01	2.9	0.000
11.433	0.000	2.92	0.00	0.01	2.9	0.000
11.450	0.000	2.92	0.00	0.01	2.9	0.000
11.467	0.000	2.93	0.00	0.01	2.9	0.000
11.483	0.000	2.93	0.00	0.01	2.9	0.000
11.500	0.000	2.94	0.00	0.01	2.9	0.000
11.517	0.000	2.95	0.00	0.01	2.9	0.000
11.533	0.000	2.95	0.00	0.01	3.0	0.000
11.550	0.000	2.96	0.00	0.01	3.0	0.000
11.567	0.000	2.96	0.00	0.01	3.0	0.000
11.583	0.000	2.97	0.00	0.01	3.0	0.000
11.600	0.000	2.97	0.00	0.01	3.0	0.000
11.617	0.000	2.97	0.00	0.01	3.0	0.000
11.633	0.000	2.98	0.00	0.01	3.0	0.000
11.650	0.000	2.98	0.00	0.01	3.0	0.000
11.667	0.000	2.98	0.00	0.01	3.0	0.000
11.683	0.000	2.98	0.00	0.01	3.0	0.000
11.700	0.000	2.99	0.00	0.01	3.0	0.000
11.717	0.000	2.99	0.00	0.01	3.0	0.000
11.733	0.000	3.00	0.00	0.01	3.0	0.000
11.750	0.000	3.00	0.00	0.01	3.0	0.000
11.767	0.000	3.01	0.00	0.01	3.0	0.000
11.783	0.000	3.02	0.00	0.01	3.0	0.000
11.800	0.000	3.02	0.00	0.01	3.0	0.000
11.817	0.000	3.03	0.00	0.01	3.0	0.000
11.833	0.000	3.04	0.00	0.01	3.0	0.000
11.850	0.000	3.04	0.00	0.01	3.0	0.000
11.867	0.000	3.05	0.00	0.01	3.1	0.000
11.883	0.000	3.06	0.00	0.01	3.1	0.000
11.900	0.000	3.06	0.00	0.01	3.1	0.000
11.917	0.000	3.07	0.00	0.01	3.1	0.000
11.933	0.000	3.07	0.00	0.01	3.1	0.000
11.950	0.000	3.07	0.00	0.01	3.1	0.000
11.967	0.000	3.08	0.00	0.01	3.1	0.000
11.983	0.000	3.08	0.00	0.01	3.1	0.000
12.000	0.000	3.08	0.00	0.01	3.1	0.000
12.017	0.000	3.09	0.00	0.01	3.1	0.000
12.033	0.000	3.09	0.00	0.01	3.1	0.000
12.050	0.000	3.10	0.00	0.01	3.1	0.000
12.067	0.000	3.11	0.00	0.01	3.1	0.000
12.083	0.000	3.13	0.00	0.01	3.1	0.000
12.100	0.000	3.15	0.00	0.01	3.2	0.000
12.117	0.000	3.17	0.00	0.01	3.2	0.000
12.133	0.000	3.19	0.00	0.01	3.2	0.000
12.150	0.000	3.21	0.00	0.01	3.2	0.000
12.167	0.000	3.23	0.00	0.01	3.2	0.000
12.183	0.000	3.25	0.00	0.01	3.2	0.000
12.200	0.000	3.27	0.00	0.01	3.3	0.000
12.217	0.000	3.28	0.00	0.01	3.3	0.000
12.233	0.000	3.29	0.00	0.01	3.3	0.000
12.250	0.000	3.29	0.00	0.01	3.3	0.000
12.267	0.000	3.29	0.00	0.01	3.3	0.000
12.283	0.000	3.30	0.00	0.01	3.3	0.000
12.300	0.000	3.30	0.00	0.01	3.3	0.000
12.317	0.000	3.31	0.00	0.01	3.3	0.000
12.333	0.000	3.31	0.00	0.01	3.3	0.000
12.350	0.000	3.31	0.00	0.01	3.3	0.000
12.367	0.000	3.32	0.00	0.01	3.3	0.000
12.383	0.000	3.32	0.00	0.01	3.3	0.000
12.400	0.000	3.33	0.00	0.01	3.3	0.000
12.417	0.000	3.34	0.00	0.01	3.3	0.000
12.433	0.000	3.35	0.00	0.01	3.3	0.000
12.450	0.000	3.36	0.00	0.01	3.4	0.000
12.467	0.000	3.37	0.00	0.01	3.4	0.000
12.483	0.000	3.37	0.00	0.01	3.4	0.000
12.500	0.000	3.38	0.00	0.01	3.4	0.000
12.517	0.000	3.39	0.00	0.01	3.4	0.000
12.533	0.000	3.40	0.00	0.01	3.4	0.000
12.550	0.000	3.41	0.00	0.01	3.4	0.000
12.567	0.000	3.41	0.00	0.01	3.4	0.000
12.583	0.000	3.42	0.00	0.01	3.4	0.000
12.600	0.000	3.42	0.00	0.01	3.4	0.000
12.617	0.000	3.42	0.00	0.01	3.4	0.000

12.633	0.000	3.43	0.00	0.01	3.4	0.000
12.650	0.000	3.43	0.00	0.01	3.4	0.000
12.667	0.000	3.44	0.00	0.01	3.4	0.000
12.683	0.000	3.44	0.00	0.01	3.4	0.000
12.700	0.000	3.45	0.00	0.01	3.4	0.000
12.717	0.000	3.45	0.00	0.01	3.5	0.000
12.733	0.000	3.46	0.00	0.01	3.5	0.000
12.750	0.000	3.47	0.00	0.01	3.5	0.000
12.767	0.000	3.48	0.00	0.01	3.5	0.000
12.783	0.000	3.49	0.00	0.01	3.5	0.000
12.800	0.000	3.50	0.00	0.01	3.5	0.000
12.817	0.000	3.51	0.00	0.01	3.5	0.000
12.833	0.000	3.52	0.00	0.01	3.5	0.000
12.850	0.000	3.53	0.00	0.01	3.5	0.000
12.867	0.000	3.54	0.00	0.01	3.5	0.000
12.883	0.000	3.55	0.00	0.01	3.5	0.000
12.900	0.000	3.55	0.00	0.01	3.6	0.000
12.917	0.000	3.56	0.00	0.01	3.6	0.000
12.933	0.000	3.56	0.00	0.01	3.6	0.000
12.950	0.000	3.57	0.00	0.01	3.6	0.000
12.967	0.000	3.57	0.00	0.01	3.6	0.000
12.983	0.000	3.58	0.00	0.01	3.6	0.000
13.000	0.000	3.58	0.00	0.01	3.6	0.000
13.017	0.000	3.59	0.00	0.01	3.6	0.000
13.033	0.000	3.59	0.00	0.01	3.6	0.000
13.050	0.000	3.60	0.00	0.01	3.6	0.000
13.067	0.000	3.61	0.00	0.01	3.6	0.000
13.083	0.000	3.63	0.00	0.01	3.6	0.000
13.100	0.000	3.64	0.00	0.01	3.6	0.000
13.117	0.000	3.65	0.00	0.01	3.6	0.000
13.133	0.000	3.66	0.00	0.01	3.7	0.000
13.150	0.000	3.67	0.00	0.01	3.7	0.000
13.167	0.000	3.68	0.00	0.01	3.7	0.000
13.183	0.000	3.69	0.00	0.01	3.7	0.000
13.200	0.000	3.70	0.00	0.01	3.7	0.000
13.217	0.000	3.71	0.00	0.01	3.7	0.000
13.233	0.000	3.72	0.00	0.01	3.7	0.000
13.250	0.000	3.72	0.00	0.01	3.7	0.000
13.267	0.000	3.73	0.00	0.01	3.7	0.000
13.283	0.000	3.73	0.00	0.01	3.7	0.000
13.300	0.000	3.74	0.00	0.01	3.7	0.000
13.317	0.000	3.75	0.00	0.01	3.7	0.000
13.333	0.000	3.75	0.00	0.01	3.8	0.000
13.350	0.000	3.76	0.00	0.01	3.8	0.000
13.367	0.000	3.77	0.00	0.01	3.8	0.000
13.383	0.000	3.78	0.00	0.01	3.8	0.000
13.400	0.000	3.79	0.00	0.01	3.8	0.000
13.417	0.000	3.80	0.00	0.01	3.8	0.000
13.433	0.000	3.82	0.00	0.01	3.8	0.000
13.450	0.000	3.83	0.00	0.01	3.8	0.000
13.467	0.000	3.84	0.00	0.01	3.8	0.000
13.483	0.000	3.86	0.00	0.01	3.9	0.000
13.500	0.000	3.87	0.00	0.01	3.9	0.000
13.517	0.000	3.88	0.00	0.01	3.9	0.000
13.533	0.000	3.89	0.00	0.01	3.9	0.000
13.550	0.000	3.90	0.00	0.01	3.9	0.000
13.567	0.000	3.91	0.00	0.01	3.9	0.000
13.583	0.000	3.92	0.00	0.01	3.9	0.000
13.600	0.000	3.92	0.00	0.01	3.9	0.000
13.617	0.000	3.93	0.00	0.01	3.9	0.000
13.633	0.000	3.94	0.00	0.01	3.9	0.000
13.650	0.000	3.95	0.00	0.01	3.9	0.000
13.667	0.000	3.95	0.00	0.01	4.0	0.000
13.683	0.000	3.96	0.00	0.01	4.0	0.000
13.700	0.000	3.97	0.00	0.01	4.0	0.000
13.717	0.000	3.98	0.00	0.01	4.0	0.000
13.733	0.000	4.00	0.00	0.01	4.0	0.000
13.750	0.000	4.02	0.00	0.01	4.0	0.000
13.767	0.000	4.03	0.00	0.01	4.0	0.000
13.783	0.000	4.05	0.00	0.01	4.0	0.000
13.800	0.000	4.06	0.00	0.01	4.1	0.000
13.817	0.000	4.08	0.00	0.02	4.1	0.000
13.833	0.000	4.09	0.00	0.02	4.1	0.000
13.850	0.000	4.11	0.00	0.02	4.1	0.000
13.867	0.000	4.12	0.00	0.02	4.1	0.000
13.883	0.000	4.13	0.00	0.02	4.1	0.000
13.900	0.000	4.14	0.00	0.02	4.1	0.000
13.917	0.000	4.15	0.00	0.02	4.2	0.000
13.933	0.000	4.16	0.00	0.02	4.2	0.000

13.950	0.000	4.17	0.00	0.02	4.2	0.000
13.967	0.000	4.18	0.00	0.02	4.2	0.000
13.983	0.000	4.19	0.00	0.02	4.2	0.000
14.000	0.000	4.19	0.00	0.02	4.2	0.000
14.017	0.000	4.20	0.00	0.02	4.2	0.000
14.033	0.000	4.20	0.00	0.02	4.2	0.000
14.050	0.000	4.18	0.00	0.02	4.2	0.000
14.067	0.000	4.16	0.00	0.02	4.2	0.000
14.083	0.000	4.13	0.00	0.02	4.1	0.000
14.100	0.000	4.11	0.00	0.02	4.1	0.000
14.117	0.000	4.09	0.00	0.02	4.1	0.000
14.133	0.000	4.06	0.00	0.01	4.1	0.000
14.150	0.000	4.04	0.00	0.01	4.0	0.000
14.167	0.000	4.02	0.00	0.01	4.0	0.000
14.183	0.000	3.99	0.00	0.01	4.0	0.000
14.200	0.000	3.99	0.00	0.01	4.0	0.000
14.217	0.000	4.00	0.00	0.01	4.0	0.000
14.233	0.000	4.01	0.00	0.01	4.0	0.000
14.250	0.000	4.02	0.00	0.01	4.0	0.000
14.267	0.000	4.03	0.00	0.01	4.0	0.000
14.283	0.000	4.04	0.00	0.01	4.0	0.000
14.300	0.000	4.05	0.00	0.01	4.1	0.000
14.317	0.000	4.06	0.00	0.01	4.1	0.000
14.333	0.000	4.08	0.00	0.02	4.1	0.000
14.350	0.000	4.09	0.00	0.02	4.1	0.000
14.367	0.000	4.11	0.00	0.02	4.1	0.000
14.383	0.000	4.13	0.00	0.02	4.1	0.000
14.400	0.000	4.16	0.00	0.02	4.2	0.000
14.417	0.000	4.18	0.00	0.02	4.2	0.000
14.433	0.000	4.21	0.00	0.02	4.2	0.000
14.450	0.000	4.24	0.00	0.02	4.2	0.000
14.467	0.000	4.26	0.00	0.02	4.3	0.000
14.483	0.000	4.29	0.00	0.02	4.3	0.000
14.500	0.000	4.31	0.00	0.02	4.3	0.000
14.517	0.000	4.34	0.00	0.02	4.3	0.000
14.533	0.000	4.36	0.00	0.02	4.4	0.000
14.550	0.000	4.37	0.00	0.02	4.4	0.000
14.567	0.000	4.39	0.00	0.02	4.4	0.000
14.583	0.000	4.41	0.00	0.02	4.4	0.000
14.600	0.000	4.42	0.00	0.02	4.4	0.000
14.617	0.000	4.44	0.00	0.02	4.4	0.000
14.633	0.000	4.45	0.00	0.02	4.4	0.000
14.650	0.000	4.47	0.00	0.02	4.5	0.000
14.667	0.000	4.48	0.00	0.02	4.5	0.000
14.683	0.000	4.50	0.00	0.02	4.5	0.000
14.700	0.000	4.53	0.00	0.02	4.5	0.000
14.717	0.000	4.56	0.00	0.02	4.6	0.000
14.733	0.000	4.60	0.00	0.02	4.6	0.000
14.750	0.000	4.63	0.00	0.02	4.6	0.000
14.767	0.000	4.67	0.00	0.02	4.7	0.000
14.783	0.000	4.70	0.00	0.02	4.7	0.000
14.800	0.000	4.74	0.00	0.02	4.7	0.000
14.817	0.000	4.78	0.00	0.02	4.8	0.000
14.833	0.000	4.81	0.00	0.02	4.8	0.000
14.850	0.000	4.85	0.00	0.02	4.8	0.000
14.867	0.000	4.87	0.00	0.02	4.9	0.000
14.883	0.000	4.89	0.00	0.02	4.9	0.000
14.900	0.000	4.91	0.00	0.02	4.9	0.000
14.917	0.000	4.94	0.00	0.02	4.9	0.000
14.933	0.000	4.96	0.00	0.02	5.0	0.000
14.950	0.000	4.98	0.00	0.02	5.0	0.000
14.967	0.000	5.00	0.00	0.02	5.0	0.000
14.983	0.000	5.02	0.00	0.02	5.0	0.000
15.000	0.000	5.04	0.00	0.02	5.0	0.000
15.017	0.000	5.07	0.00	0.02	5.1	0.000
15.033	0.000	5.12	0.00	0.02	5.1	0.000
15.050	0.000	5.18	0.00	0.02	5.2	0.000
15.067	0.000	5.24	0.00	0.02	5.2	0.000
15.083	0.000	5.30	0.00	0.02	5.3	0.000
15.100	0.000	5.36	0.00	0.02	5.4	0.000
15.117	0.000	5.42	0.00	0.02	5.4	0.000
15.133	0.000	5.48	0.00	0.02	5.5	0.000
15.150	0.000	5.54	0.00	0.02	5.5	0.000
15.167	0.000	5.60	0.00	0.02	5.6	0.000
15.183	0.000	5.65	0.00	0.02	5.6	0.000
15.200	0.000	5.69	0.00	0.02	5.7	0.000
15.217	0.000	5.73	0.00	0.02	5.7	0.000
15.233	0.000	5.77	0.00	0.02	5.8	0.000
15.250	0.000	5.81	0.00	0.02	5.8	0.000

15.267	0.000	5.85	0.00	0.02	5.9	0.000
15.283	0.000	5.89	0.00	0.02	5.9	0.000
15.300	0.000	5.93	0.00	0.02	5.9	0.000
15.317	0.000	5.97	0.00	0.02	6.0	0.000
15.333	0.000	6.01	0.00	0.02	6.0	0.000
15.350	0.000	6.03	0.00	0.02	6.0	0.000
15.367	0.000	5.99	0.00	0.02	6.0	0.000
15.383	0.000	5.93	0.00	0.02	5.9	0.000
15.400	0.000	5.88	0.00	0.02	5.9	0.000
15.417	0.000	5.82	0.00	0.02	5.8	0.000
15.433	0.000	5.77	0.00	0.02	5.8	0.000
15.450	0.000	5.72	0.00	0.02	5.7	0.000
15.467	0.000	5.66	0.00	0.02	5.7	0.000
15.483	0.000	5.61	0.00	0.02	5.6	0.000
15.500	0.000	5.55	0.00	0.02	5.6	0.000
15.517	0.000	5.53	0.00	0.02	5.5	0.000
15.533	0.000	5.61	0.00	0.02	5.6	0.000
15.550	0.000	5.68	0.00	0.02	5.7	0.000
15.567	0.000	5.76	0.00	0.02	5.8	0.000
15.583	0.000	5.84	0.00	0.02	5.8	0.000
15.600	0.000	5.92	0.00	0.02	5.9	0.000
15.617	0.000	6.00	0.00	0.02	6.0	0.000
15.633	0.000	6.08	0.00	0.02	6.1	0.000
15.650	0.000	6.16	0.00	0.02	6.2	0.000
15.667	0.000	6.24	0.00	0.02	6.2	0.000
15.683	0.000	6.38	0.00	0.02	6.4	0.000
15.700	0.000	6.65	0.00	0.03	6.6	0.001
15.717	0.000	6.91	0.00	0.03	6.9	0.001
15.733	0.000	7.18	0.00	0.03	7.2	0.001
15.750	0.000	7.45	0.00	0.03	7.4	0.001
15.767	0.000	7.72	0.00	0.03	7.7	0.001
15.783	0.000	7.99	0.00	0.03	8.0	0.001
15.800	0.000	8.26	0.00	0.03	8.2	0.001
15.817	0.000	8.53	0.00	0.03	8.5	0.001
15.833	0.000	8.80	0.00	0.03	8.8	0.001
15.850	0.000	9.11	0.00	0.03	9.1	0.001
15.867	0.000	9.48	0.00	0.04	9.5	0.001
15.883	0.000	9.84	0.00	0.04	9.8	0.001
15.900	0.000	10.21	0.00	0.04	10.2	0.001
15.917	0.000	10.58	0.00	0.04	10.6	0.001
15.933	0.000	10.94	0.00	0.04	10.9	0.001
15.950	0.000	11.31	0.00	0.04	11.3	0.001
15.967	0.000	11.67	0.00	0.04	11.7	0.001
15.983	0.000	12.04	0.00	0.04	12.0	0.001
16.000	0.000	12.41	0.00	0.05	12.4	0.001
16.017	0.000	14.01	0.00	0.06	13.9	0.001
16.033	0.000	16.84	0.00	0.07	16.7	0.001
16.050	0.000	19.67	0.00	0.08	19.5	0.002
16.067	0.000	22.51	0.00	0.09	22.3	0.002
16.083	0.000	25.34	0.00	0.10	25.2	0.002
16.100	0.000	28.18	0.00	0.12	26.9	0.004
16.117	0.000	31.01	0.00	0.18	27.2	0.009
16.133	0.000	33.84	0.00	0.23	27.3	0.018
16.150	0.000	36.68	0.00	0.29	27.4	0.031
16.167	0.000	40.64	0.00	0.34	27.4	0.049
16.183	0.000	38.63	0.00	0.38	27.5	0.064
16.200	0.000	35.27	0.00	0.40	27.5	0.075
16.217	0.000	31.92	0.00	0.41	27.6	0.081
16.233	0.000	28.56	0.00	0.41	27.6	0.082
16.250	0.000	25.20	0.00	0.41	27.6	0.079
16.267	0.000	21.85	0.00	0.39	27.6	0.071
16.283	0.000	18.49	0.00	0.36	27.5	0.059
16.300	0.000	15.13	0.00	0.32	27.5	0.042
16.317	0.000	11.78	0.00	0.24	27.4	0.020
16.333	0.000	8.49	0.00	0.06	22.2	0.001
16.350	0.000	7.34	0.00	0.00	8.5	0.000
16.367	0.000	7.24	0.00	0.05	6.5	0.001
16.383	0.000	7.14	0.00	0.01	7.7	0.000
16.400	0.000	7.04	0.00	0.04	6.6	0.001
16.417	0.000	6.94	0.00	0.01	7.3	0.000
16.433	0.000	6.84	0.00	0.03	6.6	0.001
16.450	0.000	6.74	0.00	0.02	7.0	0.000
16.467	0.000	6.64	0.00	0.03	6.5	0.001
16.483	0.000	6.54	0.00	0.02	6.7	0.000
16.500	0.000	6.44	0.00	0.03	6.3	0.001
16.517	0.000	6.34	0.00	0.02	6.4	0.000
16.533	0.000	6.23	0.00	0.03	6.1	0.001
16.550	0.000	6.11	0.00	0.02	6.2	0.000
16.567	0.000	6.00	0.00	0.02	6.0	0.000

PEAK DISCHARGE

16.583	0.000	5.89	0.00	0.02	5.9	0.000
16.600	0.000	5.78	0.00	0.02	5.8	0.000
16.617	0.000	5.67	0.00	0.02	5.7	0.000
16.633	0.000	5.56	0.00	0.02	5.5	0.000
16.650	0.000	5.45	0.00	0.02	5.5	0.000
16.667	0.000	5.34	0.00	0.02	5.3	0.000
16.683	0.000	5.27	0.00	0.02	5.3	0.000
16.700	0.000	5.20	0.00	0.02	5.2	0.000
16.717	0.000	5.13	0.00	0.02	5.1	0.000
16.733	0.000	5.07	0.00	0.02	5.1	0.000
16.750	0.000	5.00	0.00	0.02	5.0	0.000
16.767	0.000	4.93	0.00	0.02	4.9	0.000
16.783	0.000	4.87	0.00	0.02	4.9	0.000
16.800	0.000	4.80	0.00	0.02	4.8	0.000
16.817	0.000	4.73	0.00	0.02	4.7	0.000
16.833	0.000	4.67	0.00	0.02	4.7	0.000
16.850	0.000	4.62	0.00	0.02	4.6	0.000
16.867	0.000	4.58	0.00	0.02	4.6	0.000
16.883	0.000	4.53	0.00	0.02	4.5	0.000
16.900	0.000	4.48	0.00	0.02	4.5	0.000
16.917	0.000	4.44	0.00	0.02	4.4	0.000
16.933	0.000	4.39	0.00	0.02	4.4	0.000
16.950	0.000	4.35	0.00	0.02	4.4	0.000
16.967	0.000	4.30	0.00	0.02	4.3	0.000
16.983	0.000	4.26	0.00	0.02	4.3	0.000
17.000	0.000	4.22	0.00	0.02	4.2	0.000
17.017	0.000	4.22	0.00	0.02	4.2	0.000
17.033	0.000	4.22	0.00	0.02	4.2	0.000
17.050	0.000	4.22	0.00	0.02	4.2	0.000
17.067	0.000	4.22	0.00	0.02	4.2	0.000
17.083	0.000	4.22	0.00	0.02	4.2	0.000
17.100	0.000	4.22	0.00	0.02	4.2	0.000
17.117	0.000	4.22	0.00	0.02	4.2	0.000
17.133	0.000	4.22	0.00	0.02	4.2	0.000
17.150	0.000	4.22	0.00	0.02	4.2	0.000
17.167	0.000	4.22	0.00	0.02	4.2	0.000
17.183	0.000	4.20	0.00	0.02	4.2	0.000
17.200	0.000	4.18	0.00	0.02	4.2	0.000
17.217	0.000	4.17	0.00	0.02	4.2	0.000
17.233	0.000	4.15	0.00	0.02	4.1	0.000
17.250	0.000	4.13	0.00	0.02	4.1	0.000
17.267	0.000	4.11	0.00	0.02	4.1	0.000
17.283	0.000	4.09	0.00	0.02	4.1	0.000
17.300	0.000	4.07	0.00	0.01	4.1	0.000
17.317	0.000	4.05	0.00	0.01	4.1	0.000
17.333	0.000	4.04	0.00	0.01	4.0	0.000
17.350	0.000	4.01	0.00	0.01	4.0	0.000
17.367	0.000	3.99	0.00	0.01	4.0	0.000
17.383	0.000	3.97	0.00	0.01	4.0	0.000
17.400	0.000	3.95	0.00	0.01	4.0	0.000
17.417	0.000	3.93	0.00	0.01	3.9	0.000
17.433	0.000	3.91	0.00	0.01	3.9	0.000
17.450	0.000	3.88	0.00	0.01	3.9	0.000
17.467	0.000	3.86	0.00	0.01	3.9	0.000
17.483	0.000	3.84	0.00	0.01	3.8	0.000
17.500	0.000	3.82	0.00	0.01	3.8	0.000
17.517	0.000	3.80	0.00	0.01	3.8	0.000
17.533	0.000	3.79	0.00	0.01	3.8	0.000
17.550	0.000	3.77	0.00	0.01	3.8	0.000
17.567	0.000	3.75	0.00	0.01	3.7	0.000
17.583	0.000	3.73	0.00	0.01	3.7	0.000
17.600	0.000	3.71	0.00	0.01	3.7	0.000
17.617	0.000	3.69	0.00	0.01	3.7	0.000
17.633	0.000	3.68	0.00	0.01	3.7	0.000
17.650	0.000	3.66	0.00	0.01	3.7	0.000
17.667	0.000	3.64	0.00	0.01	3.6	0.000
17.683	0.000	3.63	0.00	0.01	3.6	0.000
17.700	0.000	3.61	0.00	0.01	3.6	0.000
17.717	0.000	3.60	0.00	0.01	3.6	0.000
17.733	0.000	3.58	0.00	0.01	3.6	0.000
17.750	0.000	3.56	0.00	0.01	3.6	0.000
17.767	0.000	3.55	0.00	0.01	3.5	0.000
17.783	0.000	3.53	0.00	0.01	3.5	0.000
17.800	0.000	3.52	0.00	0.01	3.5	0.000
17.817	0.000	3.50	0.00	0.01	3.5	0.000
17.833	0.000	3.49	0.00	0.01	3.5	0.000
17.850	0.000	3.47	0.00	0.01	3.5	0.000
17.867	0.000	3.46	0.00	0.01	3.5	0.000
17.883	0.000	3.45	0.00	0.01	3.4	0.000

17.900	0.000	3.43	0.00	0.01	3.4	0.000
17.917	0.000	3.42	0.00	0.01	3.4	0.000
17.933	0.000	3.41	0.00	0.01	3.4	0.000
17.950	0.000	3.39	0.00	0.01	3.4	0.000
17.967	0.000	3.38	0.00	0.01	3.4	0.000
17.983	0.000	3.37	0.00	0.01	3.4	0.000
18.000	0.000	3.35	0.00	0.01	3.3	0.000
18.017	0.000	3.33	0.00	0.01	3.3	0.000
18.033	0.000	3.31	0.00	0.01	3.3	0.000
18.050	0.000	3.29	0.00	0.01	3.3	0.000
18.067	0.000	3.27	0.00	0.01	3.3	0.000
18.083	0.000	3.25	0.00	0.01	3.3	0.000
18.100	0.000	3.23	0.00	0.01	3.2	0.000
18.117	0.000	3.21	0.00	0.01	3.2	0.000
18.133	0.000	3.19	0.00	0.01	3.2	0.000
18.150	0.000	3.18	0.00	0.01	3.2	0.000
18.167	0.000	3.16	0.00	0.01	3.2	0.000
18.183	0.000	3.14	0.00	0.01	3.1	0.000
18.200	0.000	3.13	0.00	0.01	3.1	0.000
18.217	0.000	3.12	0.00	0.01	3.1	0.000
18.233	0.000	3.10	0.00	0.01	3.1	0.000
18.250	0.000	3.09	0.00	0.01	3.1	0.000
18.267	0.000	3.07	0.00	0.01	3.1	0.000
18.283	0.000	3.06	0.00	0.01	3.1	0.000
18.300	0.000	3.04	0.00	0.01	3.0	0.000
18.317	0.000	3.03	0.00	0.01	3.0	0.000
18.333	0.000	3.02	0.00	0.01	3.0	0.000
18.350	0.000	3.01	0.00	0.01	3.0	0.000
18.367	0.000	3.00	0.00	0.01	3.0	0.000
18.383	0.000	2.99	0.00	0.01	3.0	0.000
18.400	0.000	2.98	0.00	0.01	3.0	0.000
18.417	0.000	2.97	0.00	0.01	3.0	0.000
18.433	0.000	2.96	0.00	0.01	3.0	0.000
18.450	0.000	2.95	0.00	0.01	2.9	0.000
18.467	0.000	2.94	0.00	0.01	2.9	0.000
18.483	0.000	2.93	0.00	0.01	2.9	0.000
18.500	0.000	2.92	0.00	0.01	2.9	0.000
18.517	0.000	2.91	0.00	0.01	2.9	0.000
18.533	0.000	2.90	0.00	0.01	2.9	0.000
18.550	0.000	2.89	0.00	0.01	2.9	0.000
18.567	0.000	2.89	0.00	0.01	2.9	0.000
18.583	0.000	2.88	0.00	0.01	2.9	0.000
18.600	0.000	2.87	0.00	0.01	2.9	0.000
18.617	0.000	2.86	0.00	0.01	2.9	0.000
18.633	0.000	2.85	0.00	0.01	2.9	0.000
18.650	0.000	2.84	0.00	0.01	2.8	0.000
18.667	0.000	2.83	0.00	0.01	2.8	0.000
18.683	0.000	2.83	0.00	0.01	2.8	0.000
18.700	0.000	2.82	0.00	0.01	2.8	0.000
18.717	0.000	2.81	0.00	0.01	2.8	0.000
18.733	0.000	2.80	0.00	0.01	2.8	0.000
18.750	0.000	2.80	0.00	0.01	2.8	0.000
18.767	0.000	2.79	0.00	0.01	2.8	0.000
18.783	0.000	2.78	0.00	0.01	2.8	0.000
18.800	0.000	2.77	0.00	0.01	2.8	0.000
18.817	0.000	2.76	0.00	0.01	2.8	0.000
18.833	0.000	2.76	0.00	0.01	2.8	0.000
18.850	0.000	2.75	0.00	0.01	2.8	0.000
18.867	0.000	2.74	0.00	0.01	2.7	0.000
18.883	0.000	2.74	0.00	0.01	2.7	0.000
18.900	0.000	2.73	0.00	0.01	2.7	0.000
18.917	0.000	2.72	0.00	0.01	2.7	0.000
18.933	0.000	2.71	0.00	0.01	2.7	0.000
18.950	0.000	2.71	0.00	0.01	2.7	0.000
18.967	0.000	2.70	0.00	0.01	2.7	0.000
18.983	0.000	2.69	0.00	0.01	2.7	0.000
19.000	0.000	2.69	0.00	0.01	2.7	0.000
19.017	0.000	2.68	0.00	0.01	2.7	0.000
19.033	0.000	2.67	0.00	0.01	2.7	0.000
19.050	0.000	2.67	0.00	0.01	2.7	0.000
19.067	0.000	2.66	0.00	0.01	2.7	0.000
19.083	0.000	2.65	0.00	0.01	2.7	0.000
19.100	0.000	2.65	0.00	0.01	2.6	0.000
19.117	0.000	2.64	0.00	0.01	2.6	0.000
19.133	0.000	2.63	0.00	0.01	2.6	0.000
19.150	0.000	2.63	0.00	0.01	2.6	0.000
19.167	0.000	2.62	0.00	0.01	2.6	0.000
19.183	0.000	2.61	0.00	0.01	2.6	0.000
19.200	0.000	2.61	0.00	0.01	2.6	0.000

19.217	0.000	2.60	0.00	0.01	2.6	0.000
19.233	0.000	2.60	0.00	0.01	2.6	0.000
19.250	0.000	2.59	0.00	0.01	2.6	0.000
19.267	0.000	2.58	0.00	0.01	2.6	0.000
19.283	0.000	2.58	0.00	0.01	2.6	0.000
19.300	0.000	2.57	0.00	0.01	2.6	0.000
19.317	0.000	2.57	0.00	0.01	2.6	0.000
19.333	0.000	2.56	0.00	0.01	2.6	0.000
19.350	0.000	2.55	0.00	0.01	2.6	0.000
19.367	0.000	2.55	0.00	0.01	2.5	0.000
19.383	0.000	2.54	0.00	0.01	2.5	0.000
19.400	0.000	2.54	0.00	0.01	2.5	0.000
19.417	0.000	2.53	0.00	0.01	2.5	0.000
19.433	0.000	2.53	0.00	0.01	2.5	0.000
19.450	0.000	2.52	0.00	0.01	2.5	0.000
19.467	0.000	2.51	0.00	0.01	2.5	0.000
19.483	0.000	2.51	0.00	0.01	2.5	0.000
19.500	0.000	2.50	0.00	0.01	2.5	0.000
19.517	0.000	2.50	0.00	0.01	2.5	0.000
19.533	0.000	2.49	0.00	0.01	2.5	0.000
19.550	0.000	2.49	0.00	0.01	2.5	0.000
19.567	0.000	2.48	0.00	0.01	2.5	0.000
19.583	0.000	2.48	0.00	0.01	2.5	0.000
19.600	0.000	2.47	0.00	0.01	2.5	0.000
19.617	0.000	2.47	0.00	0.01	2.5	0.000
19.633	0.000	2.46	0.00	0.01	2.5	0.000
19.650	0.000	2.46	0.00	0.01	2.5	0.000
19.667	0.000	2.45	0.00	0.01	2.5	0.000
19.683	0.000	2.45	0.00	0.01	2.4	0.000
19.700	0.000	2.44	0.00	0.01	2.4	0.000
19.717	0.000	2.44	0.00	0.01	2.4	0.000
19.733	0.000	2.43	0.00	0.01	2.4	0.000
19.750	0.000	2.43	0.00	0.01	2.4	0.000
19.767	0.000	2.42	0.00	0.01	2.4	0.000
19.783	0.000	2.42	0.00	0.01	2.4	0.000
19.800	0.000	2.41	0.00	0.01	2.4	0.000
19.817	0.000	2.41	0.00	0.01	2.4	0.000
19.833	0.000	2.40	0.00	0.01	2.4	0.000
19.850	0.000	2.40	0.00	0.01	2.4	0.000
19.867	0.000	2.39	0.00	0.01	2.4	0.000
19.883	0.000	2.39	0.00	0.01	2.4	0.000
19.900	0.000	2.38	0.00	0.01	2.4	0.000
19.917	0.000	2.38	0.00	0.01	2.4	0.000
19.933	0.000	2.37	0.00	0.01	2.4	0.000
19.950	0.000	2.37	0.00	0.01	2.4	0.000
19.967	0.000	2.36	0.00	0.01	2.4	0.000
19.983	0.000	2.36	0.00	0.01	2.4	0.000
20.000	0.000	2.36	0.00	0.01	2.4	0.000
20.017	0.000	2.35	0.00	0.01	2.4	0.000
20.033	0.000	2.35	0.00	0.01	2.3	0.000
20.050	0.000	2.34	0.00	0.01	2.3	0.000
20.067	0.000	2.34	0.00	0.01	2.3	0.000
20.083	0.000	2.33	0.00	0.01	2.3	0.000
20.100	0.000	2.33	0.00	0.01	2.3	0.000
20.117	0.000	2.33	0.00	0.01	2.3	0.000
20.133	0.000	2.32	0.00	0.01	2.3	0.000
20.150	0.000	2.32	0.00	0.01	2.3	0.000
20.167	0.000	2.31	0.00	0.01	2.3	0.000
20.183	0.000	2.31	0.00	0.01	2.3	0.000
20.200	0.000	2.30	0.00	0.01	2.3	0.000
20.217	0.000	2.30	0.00	0.01	2.3	0.000
20.233	0.000	2.30	0.00	0.01	2.3	0.000
20.250	0.000	2.29	0.00	0.01	2.3	0.000
20.267	0.000	2.29	0.00	0.01	2.3	0.000
20.283	0.000	2.28	0.00	0.01	2.3	0.000
20.300	0.000	2.28	0.00	0.01	2.3	0.000
20.317	0.000	2.28	0.00	0.01	2.3	0.000
20.333	0.000	2.27	0.00	0.01	2.3	0.000
20.350	0.000	2.27	0.00	0.01	2.3	0.000
20.367	0.000	2.26	0.00	0.01	2.3	0.000
20.383	0.000	2.26	0.00	0.01	2.3	0.000
20.400	0.000	2.26	0.00	0.01	2.3	0.000
20.417	0.000	2.25	0.00	0.01	2.3	0.000
20.433	0.000	2.25	0.00	0.01	2.2	0.000
20.450	0.000	2.25	0.00	0.01	2.2	0.000
20.467	0.000	2.24	0.00	0.01	2.2	0.000
20.483	0.000	2.24	0.00	0.01	2.2	0.000
20.500	0.000	2.23	0.00	0.01	2.2	0.000
20.517	0.000	2.23	0.00	0.01	2.2	0.000

20.533	0.000	2.23	0.00	0.01	2.2	0.000
20.550	0.000	2.22	0.00	0.01	2.2	0.000
20.567	0.000	2.22	0.00	0.01	2.2	0.000
20.583	0.000	2.22	0.00	0.01	2.2	0.000
20.600	0.000	2.21	0.00	0.01	2.2	0.000
20.617	0.000	2.21	0.00	0.01	2.2	0.000
20.633	0.000	2.20	0.00	0.01	2.2	0.000
20.650	0.000	2.20	0.00	0.01	2.2	0.000
20.667	0.000	2.20	0.00	0.01	2.2	0.000
20.683	0.000	2.19	0.00	0.01	2.2	0.000
20.700	0.000	2.19	0.00	0.01	2.2	0.000
20.717	0.000	2.19	0.00	0.01	2.2	0.000
20.733	0.000	2.18	0.00	0.01	2.2	0.000
20.750	0.000	2.18	0.00	0.01	2.2	0.000
20.767	0.000	2.18	0.00	0.01	2.2	0.000
20.783	0.000	2.17	0.00	0.01	2.2	0.000
20.800	0.000	2.17	0.00	0.01	2.2	0.000
20.817	0.000	2.17	0.00	0.01	2.2	0.000
20.833	0.000	2.16	0.00	0.01	2.2	0.000
20.850	0.000	2.16	0.00	0.01	2.2	0.000
20.867	0.000	2.16	0.00	0.01	2.2	0.000
20.883	0.000	2.15	0.00	0.01	2.2	0.000
20.900	0.000	2.15	0.00	0.01	2.2	0.000
20.917	0.000	2.15	0.00	0.01	2.1	0.000
20.933	0.000	2.14	0.00	0.01	2.1	0.000
20.950	0.000	2.14	0.00	0.01	2.1	0.000
20.967	0.000	2.14	0.00	0.01	2.1	0.000
20.983	0.000	2.13	0.00	0.01	2.1	0.000
21.000	0.000	2.13	0.00	0.01	2.1	0.000
21.017	0.000	2.13	0.00	0.01	2.1	0.000
21.033	0.000	2.12	0.00	0.01	2.1	0.000
21.050	0.000	2.12	0.00	0.01	2.1	0.000
21.067	0.000	2.12	0.00	0.01	2.1	0.000
21.083	0.000	2.12	0.00	0.01	2.1	0.000
21.100	0.000	2.11	0.00	0.01	2.1	0.000
21.117	0.000	2.11	0.00	0.01	2.1	0.000
21.133	0.000	2.11	0.00	0.01	2.1	0.000
21.150	0.000	2.10	0.00	0.01	2.1	0.000
21.167	0.000	2.10	0.00	0.01	2.1	0.000
21.183	0.000	2.10	0.00	0.01	2.1	0.000
21.200	0.000	2.09	0.00	0.01	2.1	0.000
21.217	0.000	2.09	0.00	0.01	2.1	0.000
21.233	0.000	2.09	0.00	0.01	2.1	0.000
21.250	0.000	2.08	0.00	0.01	2.1	0.000
21.267	0.000	2.08	0.00	0.01	2.1	0.000
21.283	0.000	2.08	0.00	0.01	2.1	0.000
21.300	0.000	2.08	0.00	0.01	2.1	0.000
21.317	0.000	2.07	0.00	0.01	2.1	0.000
21.333	0.000	2.07	0.00	0.01	2.1	0.000
21.350	0.000	2.07	0.00	0.01	2.1	0.000
21.367	0.000	2.06	0.00	0.01	2.1	0.000
21.383	0.000	2.06	0.00	0.01	2.1	0.000
21.400	0.000	2.06	0.00	0.01	2.1	0.000
21.417	0.000	2.06	0.00	0.01	2.1	0.000
21.433	0.000	2.05	0.00	0.01	2.1	0.000
21.450	0.000	2.05	0.00	0.01	2.1	0.000
21.467	0.000	2.05	0.00	0.01	2.0	0.000
21.483	0.000	2.04	0.00	0.01	2.0	0.000
21.500	0.000	2.04	0.00	0.01	2.0	0.000
21.517	0.000	2.04	0.00	0.01	2.0	0.000
21.533	0.000	2.04	0.00	0.01	2.0	0.000
21.550	0.000	2.03	0.00	0.01	2.0	0.000
21.567	0.000	2.03	0.00	0.01	2.0	0.000
21.583	0.000	2.03	0.00	0.01	2.0	0.000
21.600	0.000	2.03	0.00	0.01	2.0	0.000
21.617	0.000	2.02	0.00	0.01	2.0	0.000
21.633	0.000	2.02	0.00	0.01	2.0	0.000
21.650	0.000	2.02	0.00	0.01	2.0	0.000
21.667	0.000	2.01	0.00	0.01	2.0	0.000
21.683	0.000	2.01	0.00	0.01	2.0	0.000
21.700	0.000	2.01	0.00	0.01	2.0	0.000
21.717	0.000	2.01	0.00	0.01	2.0	0.000
21.733	0.000	2.00	0.00	0.01	2.0	0.000
21.750	0.000	2.00	0.00	0.01	2.0	0.000
21.767	0.000	2.00	0.00	0.01	2.0	0.000
21.783	0.000	2.00	0.00	0.01	2.0	0.000
21.800	0.000	1.99	0.00	0.01	2.0	0.000
21.817	0.000	1.99	0.00	0.01	2.0	0.000
21.833	0.000	1.99	0.00	0.01	2.0	0.000

21.850	0.000	1.99	0.00	0.01	2.0	0.000
21.867	0.000	1.98	0.00	0.01	2.0	0.000
21.883	0.000	1.98	0.00	0.01	2.0	0.000
21.900	0.000	1.98	0.00	0.01	2.0	0.000
21.917	0.000	1.98	0.00	0.01	2.0	0.000
21.933	0.000	1.97	0.00	0.01	2.0	0.000
21.950	0.000	1.97	0.00	0.01	2.0	0.000
21.967	0.000	1.97	0.00	0.01	2.0	0.000
21.983	0.000	1.97	0.00	0.01	2.0	0.000
22.000	0.000	1.96	0.00	0.01	2.0	0.000
22.017	0.000	1.96	0.00	0.01	2.0	0.000
22.033	0.000	1.96	0.00	0.01	2.0	0.000
22.050	0.000	1.96	0.00	0.01	2.0	0.000
22.067	0.000	1.95	0.00	0.01	2.0	0.000
22.083	0.000	1.95	0.00	0.01	2.0	0.000
22.100	0.000	1.95	0.00	0.01	1.9	0.000
22.117	0.000	1.95	0.00	0.01	1.9	0.000
22.133	0.000	1.94	0.00	0.01	1.9	0.000
22.150	0.000	1.94	0.00	0.01	1.9	0.000
22.167	0.000	1.94	0.00	0.01	1.9	0.000
22.183	0.000	1.94	0.00	0.01	1.9	0.000
22.200	0.000	1.94	0.00	0.01	1.9	0.000
22.216	0.000	1.93	0.00	0.01	1.9	0.000
22.233	0.000	1.93	0.00	0.01	1.9	0.000
22.250	0.000	1.93	0.00	0.01	1.9	0.000
22.266	0.000	1.93	0.00	0.01	1.9	0.000
22.283	0.000	1.92	0.00	0.01	1.9	0.000
22.300	0.000	1.92	0.00	0.01	1.9	0.000
22.316	0.000	1.92	0.00	0.01	1.9	0.000
22.333	0.000	1.92	0.00	0.01	1.9	0.000
22.350	0.000	1.91	0.00	0.01	1.9	0.000
22.366	0.000	1.91	0.00	0.01	1.9	0.000
22.383	0.000	1.91	0.00	0.01	1.9	0.000
22.400	0.000	1.91	0.00	0.01	1.9	0.000
22.416	0.000	1.91	0.00	0.01	1.9	0.000
22.433	0.000	1.90	0.00	0.01	1.9	0.000
22.450	0.000	1.90	0.00	0.01	1.9	0.000
22.466	0.000	1.90	0.00	0.01	1.9	0.000
22.483	0.000	1.90	0.00	0.01	1.9	0.000
22.500	0.000	1.89	0.00	0.01	1.9	0.000
22.516	0.000	1.89	0.00	0.01	1.9	0.000
22.533	0.000	1.89	0.00	0.01	1.9	0.000
22.550	0.000	1.89	0.00	0.01	1.9	0.000
22.566	0.000	1.89	0.00	0.01	1.9	0.000
22.583	0.000	1.88	0.00	0.01	1.9	0.000
22.600	0.000	1.88	0.00	0.01	1.9	0.000
22.616	0.000	1.88	0.00	0.01	1.9	0.000
22.633	0.000	1.88	0.00	0.01	1.9	0.000
22.650	0.000	1.88	0.00	0.01	1.9	0.000
22.666	0.000	1.87	0.00	0.01	1.9	0.000
22.683	0.000	1.87	0.00	0.01	1.9	0.000
22.700	0.000	1.87	0.00	0.01	1.9	0.000
22.716	0.000	1.87	0.00	0.01	1.9	0.000
22.733	0.000	1.87	0.00	0.01	1.9	0.000
22.750	0.000	1.86	0.00	0.01	1.9	0.000
22.766	0.000	1.86	0.00	0.01	1.9	0.000
22.783	0.000	1.86	0.00	0.01	1.9	0.000
22.800	0.000	1.86	0.00	0.01	1.9	0.000
22.816	0.000	1.86	0.00	0.01	1.9	0.000
22.833	0.000	1.85	0.00	0.01	1.9	0.000
22.850	0.000	1.85	0.00	0.01	1.9	0.000
22.866	0.000	1.85	0.00	0.01	1.8	0.000
22.883	0.000	1.85	0.00	0.01	1.8	0.000
22.900	0.000	1.85	0.00	0.01	1.8	0.000
22.916	0.000	1.84	0.00	0.01	1.8	0.000
22.933	0.000	1.84	0.00	0.01	1.8	0.000
22.950	0.000	1.84	0.00	0.01	1.8	0.000
22.966	0.000	1.84	0.00	0.01	1.8	0.000
22.983	0.000	1.84	0.00	0.01	1.8	0.000
23.000	0.000	1.83	0.00	0.01	1.8	0.000
23.016	0.000	1.83	0.00	0.01	1.8	0.000
23.033	0.000	1.83	0.00	0.01	1.8	0.000
23.050	0.000	1.83	0.00	0.01	1.8	0.000
23.066	0.000	1.83	0.00	0.01	1.8	0.000
23.083	0.000	1.82	0.00	0.01	1.8	0.000
23.100	0.000	1.82	0.00	0.01	1.8	0.000
23.116	0.000	1.82	0.00	0.01	1.8	0.000
23.133	0.000	1.82	0.00	0.01	1.8	0.000
23.150	0.000	1.82	0.00	0.01	1.8	0.000

23.166	0.000	1.81	0.00	0.01	1.8	0.000
23.183	0.000	1.81	0.00	0.01	1.8	0.000
23.200	0.000	1.81	0.00	0.01	1.8	0.000
23.216	0.000	1.81	0.00	0.01	1.8	0.000
23.233	0.000	1.81	0.00	0.01	1.8	0.000
23.250	0.000	1.80	0.00	0.01	1.8	0.000
23.266	0.000	1.80	0.00	0.01	1.8	0.000
23.283	0.000	1.80	0.00	0.01	1.8	0.000
23.300	0.000	1.80	0.00	0.01	1.8	0.000
23.316	0.000	1.80	0.00	0.01	1.8	0.000
23.333	0.000	1.80	0.00	0.01	1.8	0.000
23.350	0.000	1.79	0.00	0.01	1.8	0.000
23.366	0.000	1.79	0.00	0.01	1.8	0.000
23.383	0.000	1.79	0.00	0.01	1.8	0.000
23.400	0.000	1.79	0.00	0.01	1.8	0.000
23.416	0.000	1.79	0.00	0.01	1.8	0.000
23.433	0.000	1.79	0.00	0.01	1.8	0.000
23.450	0.000	1.78	0.00	0.01	1.8	0.000
23.466	0.000	1.78	0.00	0.01	1.8	0.000
23.483	0.000	1.78	0.00	0.01	1.8	0.000
23.500	0.000	1.78	0.00	0.01	1.8	0.000
23.516	0.000	1.78	0.00	0.01	1.8	0.000
23.533	0.000	1.77	0.00	0.01	1.8	0.000
23.550	0.000	1.77	0.00	0.01	1.8	0.000
23.566	0.000	1.77	0.00	0.01	1.8	0.000
23.583	0.000	1.77	0.00	0.01	1.8	0.000
23.600	0.000	1.77	0.00	0.01	1.8	0.000
23.616	0.000	1.77	0.00	0.01	1.8	0.000
23.633	0.000	1.76	0.00	0.01	1.8	0.000
23.650	0.000	1.76	0.00	0.01	1.8	0.000
23.666	0.000	1.76	0.00	0.01	1.8	0.000
23.683	0.000	1.76	0.00	0.01	1.8	0.000
23.700	0.000	1.76	0.00	0.01	1.8	0.000
23.716	0.000	1.76	0.00	0.01	1.8	0.000
23.733	0.000	1.75	0.00	0.01	1.8	0.000
23.750	0.000	1.75	0.00	0.01	1.8	0.000
23.766	0.000	1.75	0.00	0.01	1.8	0.000
23.783	0.000	1.75	0.00	0.01	1.7	0.000
23.800	0.000	1.75	0.00	0.01	1.7	0.000
23.816	0.000	1.75	0.00	0.01	1.7	0.000
23.833	0.000	1.74	0.00	0.01	1.7	0.000
23.850	0.000	1.74	0.00	0.01	1.7	0.000
23.866	0.000	1.74	0.00	0.01	1.7	0.000
23.883	0.000	1.74	0.00	0.01	1.7	0.000
23.900	0.000	1.74	0.00	0.01	1.7	0.000
23.916	0.000	1.74	0.00	0.01	1.7	0.000
23.933	0.000	1.73	0.00	0.01	1.7	0.000
23.950	0.000	1.73	0.00	0.01	1.7	0.000
23.966	0.000	1.73	0.00	0.01	1.7	0.000
23.983	0.000	1.73	0.00	0.01	1.7	0.000
24.000	0.000	1.73	0.00	0.01	1.7	0.000
24.016	0.000	1.73	0.00	0.01	1.7	0.000
24.033	0.000	1.72	0.00	0.01	1.7	0.000
24.050	0.000	1.72	0.00	0.01	1.7	0.000
24.066	0.000	1.72	0.00	0.01	1.7	0.000
24.083	0.000	1.72	0.00	0.01	1.7	0.000
24.100	0.000	1.65	0.00	0.01	1.7	0.000
24.116	0.000	1.48	0.00	0.01	1.5	0.000
24.133	0.000	1.30	0.00	0.00	1.3	0.000
24.150	0.000	1.13	0.00	0.00	1.1	0.000
24.166	0.000	0.95	0.00	0.00	1.0	0.000
24.183	0.000	0.78	0.00	0.00	0.8	0.000
24.200	0.000	0.61	0.00	0.00	0.6	0.000
24.216	0.000	0.43	0.00	0.00	0.4	0.000
24.233	0.000	0.26	0.00	0.00	0.3	0.000
24.250	0.000	0.09	0.00	0.00	0.1	0.000
24.266	0.000	0.00	0.00	0.00	0.0	0.000
24.283	0.000	0.00	0.00	0.00	0.0	0.000
24.300	0.000	0.00	0.00	0.00	0.0	0.000
24.316	0.000	0.00	0.00	0.00	0.0	0.000
24.333	0.000	0.00	0.00	0.00	0.0	0.000
24.350	0.000	0.00	0.00	0.00	0.0	0.000
24.366	0.000	0.00	0.00	0.00	0.0	0.000
24.383	0.000	0.00	0.00	0.00	0.0	0.000
24.400	0.000	0.00	0.00	0.00	0.0	0.000
24.416	0.000	0.00	0.00	0.00	0.0	0.000
24.433	0.000	0.00	0.00	0.00	0.0	0.000
24.450	0.000	0.00	0.00	0.00	0.0	0.000
24.466	0.000	0.00	0.00	0.00	0.0	0.000

24.483	0.000	0.00	0.00	0.00	0.0	0.000
24.500	0.000	0.00	0.00	0.00	0.0	0.000
24.516	0.000	0.00	0.00	0.00	0.0	0.000
24.533	0.000	0.00	0.00	0.00	0.0	0.000
24.550	0.000	0.00	0.00	0.00	0.0	0.000
24.566	0.000	0.00	0.00	0.00	0.0	0.000
24.583	0.000	0.00	0.00	0.00	0.0	0.000
24.600	0.000	0.00	0.00	0.00	0.0	0.000
24.616	0.000	0.00	0.00	0.00	0.0	0.000
24.633	0.000	0.00	0.00	0.00	0.0	0.000
24.650	0.000	0.00	0.00	0.00	0.0	0.000
24.666	0.000	0.00	0.00	0.00	0.0	0.000
24.683	0.000	0.00	0.00	0.00	0.0	0.000
24.700	0.000	0.00	0.00	0.00	0.0	0.000
24.716	0.000	0.00	0.00	0.00	0.0	0.000
24.733	0.000	0.00	0.00	0.00	0.0	0.000
24.750	0.000	0.00	0.00	0.00	0.0	0.000
24.766	0.000	0.00	0.00	0.00	0.0	0.000
24.783	0.000	0.00	0.00	0.00	0.0	0.000
24.800	0.000	0.00	0.00	0.00	0.0	0.000
24.816	0.000	0.00	0.00	0.00	0.0	0.000
24.833	0.000	0.00	0.00	0.00	0.0	0.000
24.850	0.000	0.00	0.00	0.00	0.0	0.000
24.866	0.000	0.00	0.00	0.00	0.0	0.000
24.883	0.000	0.00	0.00	0.00	0.0	0.000
24.900	0.000	0.00	0.00	0.00	0.0	0.000
24.916	0.000	0.00	0.00	0.00	0.0	0.000
24.933	0.000	0.00	0.00	0.00	0.0	0.000
24.950	0.000	0.00	0.00	0.00	0.0	0.000
24.966	0.000	0.00	0.00	0.00	0.0	0.000
24.983	0.000	0.00	0.00	0.00	0.0	0.000
25.000	0.000	0.00	0.00	0.00	0.0	0.000
25.016	0.000	0.00	0.00	0.00	0.0	0.000
25.033	0.000	0.00	0.00	0.00	0.0	0.000
25.050	0.000	0.00	0.00	0.00	0.0	0.000
25.066	0.000	0.00	0.00	0.00	0.0	0.000
25.083	0.000	0.00	0.00	0.00	0.0	0.000
25.100	0.000	0.00	0.00	0.00	0.0	0.000
25.116	0.000	0.00	0.00	0.00	0.0	0.000
25.133	0.000	0.00	0.00	0.00	0.0	0.000
25.150	0.000	0.00	0.00	0.00	0.0	0.000
25.166	0.000	0.00	0.00	0.00	0.0	0.000
25.183	0.000	0.00	0.00	0.00	0.0	0.000
25.200	0.000	0.00	0.00	0.00	0.0	0.000
25.216	0.000	0.00	0.00	0.00	0.0	0.000
25.233	0.000	0.00	0.00	0.00	0.0	0.000
25.250	0.000	0.00	0.00	0.00	0.0	0.000
25.266	0.000	0.00	0.00	0.00	0.0	0.000
25.283	0.000	0.00	0.00	0.00	0.0	0.000
25.300	0.000	0.00	0.00	0.00	0.0	0.000
25.316	0.000	0.00	0.00	0.00	0.0	0.000
25.333	0.000	0.00	0.00	0.00	0.0	0.000
25.350	0.000	0.00	0.00	0.00	0.0	0.000
25.366	0.000	0.00	0.00	0.00	0.0	0.000
25.383	0.000	0.00	0.00	0.00	0.0	0.000
25.400	0.000	0.00	0.00	0.00	0.0	0.000
25.416	0.000	0.00	0.00	0.00	0.0	0.000
25.433	0.000	0.00	0.00	0.00	0.0	0.000
25.450	0.000	0.00	0.00	0.00	0.0	0.000
25.466	0.000	0.00	0.00	0.00	0.0	0.000
25.483	0.000	0.00	0.00	0.00	0.0	0.000
25.500	0.000	0.00	0.00	0.00	0.0	0.000
25.516	0.000	0.00	0.00	0.00	0.0	0.000
25.533	0.000	0.00	0.00	0.00	0.0	0.000
25.550	0.000	0.00	0.00	0.00	0.0	0.000
25.566	0.000	0.00	0.00	0.00	0.0	0.000
25.583	0.000	0.00	0.00	0.00	0.0	0.000
25.600	0.000	0.00	0.00	0.00	0.0	0.000
25.616	0.000	0.00	0.00	0.00	0.0	0.000
25.633	0.000	0.00	0.00	0.00	0.0	0.000
25.650	0.000	0.00	0.00	0.00	0.0	0.000
25.666	0.000	0.00	0.00	0.00	0.0	0.000
25.683	0.000	0.00	0.00	0.00	0.0	0.000
25.700	0.000	0.00	0.00	0.00	0.0	0.000
25.716	0.000	0.00	0.00	0.00	0.0	0.000
25.733	0.000	0.00	0.00	0.00	0.0	0.000
25.750	0.000	0.00	0.00	0.00	0.0	0.000
25.766	0.000	0.00	0.00	0.00	0.0	0.000
25.783	0.000	0.00	0.00	0.00	0.0	0.000

25.800	0.000	0.00	0.00	0.00	0.0	0.000
25.816	0.000	0.00	0.00	0.00	0.0	0.000
25.833	0.000	0.00	0.00	0.00	0.0	0.000
25.850	0.000	0.00	0.00	0.00	0.0	0.000
25.866	0.000	0.00	0.00	0.00	0.0	0.000
25.883	0.000	0.00	0.00	0.00	0.0	0.000
25.900	0.000	0.00	0.00	0.00	0.0	0.000
25.916	0.000	0.00	0.00	0.00	0.0	0.000
25.933	0.000	0.00	0.00	0.00	0.0	0.000
25.950	0.000	0.00	0.00	0.00	0.0	0.000
25.966	0.000	0.00	0.00	0.00	0.0	0.000
25.983	0.000	0.00	0.00	0.00	0.0	0.000
26.000	0.000	0.00	0.00	0.00	0.0	0.000
26.016	0.000	0.00	0.00	0.00	0.0	0.000
26.033	0.000	0.00	0.00	0.00	0.0	0.000
26.050	0.000	0.00	0.00	0.00	0.0	0.000
26.066	0.000	0.00	0.00	0.00	0.0	0.000
26.083	0.000	0.00	0.00	0.00	0.0	0.000
26.100	0.000	0.00	0.00	0.00	0.0	0.000
26.116	0.000	0.00	0.00	0.00	0.0	0.000
26.133	0.000	0.00	0.00	0.00	0.0	0.000
26.150	0.000	0.00	0.00	0.00	0.0	0.000
26.166	0.000	0.00	0.00	0.00	0.0	0.000
26.183	0.000	0.00	0.00	0.00	0.0	0.000
26.200	0.000	0.00	0.00	0.00	0.0	0.000
26.216	0.000	0.00	0.00	0.00	0.0	0.000
26.233	0.000	0.00	0.00	0.00	0.0	0.000
26.250	0.000	0.00	0.00	0.00	0.0	0.000
26.266	0.000	0.00	0.00	0.00	0.0	0.000
26.283	0.000	0.00	0.00	0.00	0.0	0.000
26.300	0.000	0.00	0.00	0.00	0.0	0.000
26.316	0.000	0.00	0.00	0.00	0.0	0.000
26.333	0.000	0.00	0.00	0.00	0.0	0.000
26.350	0.000	0.00	0.00	0.00	0.0	0.000
26.366	0.000	0.00	0.00	0.00	0.0	0.000
26.383	0.000	0.00	0.00	0.00	0.0	0.000
26.400	0.000	0.00	0.00	0.00	0.0	0.000
26.416	0.000	0.00	0.00	0.00	0.0	0.000
26.433	0.000	0.00	0.00	0.00	0.0	0.000
26.450	0.000	0.00	0.00	0.00	0.0	0.000
26.466	0.000	0.00	0.00	0.00	0.0	0.000
26.483	0.000	0.00	0.00	0.00	0.0	0.000
26.500	0.000	0.00	0.00	0.00	0.0	0.000
26.516	0.000	0.00	0.00	0.00	0.0	0.000
26.533	0.000	0.00	0.00	0.00	0.0	0.000
26.550	0.000	0.00	0.00	0.00	0.0	0.000
26.566	0.000	0.00	0.00	0.00	0.0	0.000
26.583	0.000	0.00	0.00	0.00	0.0	0.000
26.600	0.000	0.00	0.00	0.00	0.0	0.000
26.616	0.000	0.00	0.00	0.00	0.0	0.000
26.633	0.000	0.00	0.00	0.00	0.0	0.000
26.650	0.000	0.00	0.00	0.00	0.0	0.000
26.666	0.000	0.00	0.00	0.00	0.0	0.000
26.683	0.000	0.00	0.00	0.00	0.0	0.000
26.700	0.000	0.00	0.00	0.00	0.0	0.000
26.716	0.000	0.00	0.00	0.00	0.0	0.000
26.733	0.000	0.00	0.00	0.00	0.0	0.000
26.750	0.000	0.00	0.00	0.00	0.0	0.000
26.766	0.000	0.00	0.00	0.00	0.0	0.000
26.783	0.000	0.00	0.00	0.00	0.0	0.000
26.800	0.000	0.00	0.00	0.00	0.0	0.000
26.816	0.000	0.00	0.00	0.00	0.0	0.000
26.833	0.000	0.00	0.00	0.00	0.0	0.000
26.850	0.000	0.00	0.00	0.00	0.0	0.000
26.866	0.000	0.00	0.00	0.00	0.0	0.000
26.883	0.000	0.00	0.00	0.00	0.0	0.000
26.900	0.000	0.00	0.00	0.00	0.0	0.000
26.916	0.000	0.00	0.00	0.00	0.0	0.000
26.933	0.000	0.00	0.00	0.00	0.0	0.000
26.950	0.000	0.00	0.00	0.00	0.0	0.000
26.966	0.000	0.00	0.00	0.00	0.0	0.000
26.983	0.000	0.00	0.00	0.00	0.0	0.000
27.000	0.000	0.00	0.00	0.00	0.0	0.000
27.016	0.000	0.00	0.00	0.00	0.0	0.000
27.033	0.000	0.00	0.00	0.00	0.0	0.000
27.050	0.000	0.00	0.00	0.00	0.0	0.000
27.066	0.000	0.00	0.00	0.00	0.0	0.000
27.083	0.000	0.00	0.00	0.00	0.0	0.000
27.100	0.000	0.00	0.00	0.00	0.0	0.000

27.116	0.000	0.00	0.00	0.00	0.0	0.000
27.133	0.000	0.00	0.00	0.00	0.0	0.000
27.150	0.000	0.00	0.00	0.00	0.0	0.000
27.166	0.000	0.00	0.00	0.00	0.0	0.000
27.183	0.000	0.00	0.00	0.00	0.0	0.000
27.200	0.000	0.00	0.00	0.00	0.0	0.000
27.216	0.000	0.00	0.00	0.00	0.0	0.000
27.233	0.000	0.00	0.00	0.00	0.0	0.000
27.250	0.000	0.00	0.00	0.00	0.0	0.000
27.266	0.000	0.00	0.00	0.00	0.0	0.000
27.283	0.000	0.00	0.00	0.00	0.0	0.000
27.300	0.000	0.00	0.00	0.00	0.0	0.000
27.316	0.000	0.00	0.00	0.00	0.0	0.000
27.333	0.000	0.00	0.00	0.00	0.0	0.000
27.350	0.000	0.00	0.00	0.00	0.0	0.000
27.366	0.000	0.00	0.00	0.00	0.0	0.000
27.383	0.000	0.00	0.00	0.00	0.0	0.000
27.400	0.000	0.00	0.00	0.00	0.0	0.000
27.416	0.000	0.00	0.00	0.00	0.0	0.000
27.433	0.000	0.00	0.00	0.00	0.0	0.000
27.450	0.000	0.00	0.00	0.00	0.0	0.000
27.466	0.000	0.00	0.00	0.00	0.0	0.000
27.483	0.000	0.00	0.00	0.00	0.0	0.000
27.500	0.000	0.00	0.00	0.00	0.0	0.000
27.516	0.000	0.00	0.00	0.00	0.0	0.000
27.533	0.000	0.00	0.00	0.00	0.0	0.000
27.550	0.000	0.00	0.00	0.00	0.0	0.000
27.566	0.000	0.00	0.00	0.00	0.0	0.000
27.583	0.000	0.00	0.00	0.00	0.0	0.000
27.600	0.000	0.00	0.00	0.00	0.0	0.000
27.616	0.000	0.00	0.00	0.00	0.0	0.000
27.633	0.000	0.00	0.00	0.00	0.0	0.000
27.650	0.000	0.00	0.00	0.00	0.0	0.000
27.666	0.000	0.00	0.00	0.00	0.0	0.000
27.683	0.000	0.00	0.00	0.00	0.0	0.000
27.700	0.000	0.00	0.00	0.00	0.0	0.000
27.716	0.000	0.00	0.00	0.00	0.0	0.000
27.733	0.000	0.00	0.00	0.00	0.0	0.000
27.750	0.000	0.00	0.00	0.00	0.0	0.000
27.766	0.000	0.00	0.00	0.00	0.0	0.000
27.783	0.000	0.00	0.00	0.00	0.0	0.000
27.800	0.000	0.00	0.00	0.00	0.0	0.000
27.816	0.000	0.00	0.00	0.00	0.0	0.000
27.833	0.000	0.00	0.00	0.00	0.0	0.000
27.850	0.000	0.00	0.00	0.00	0.0	0.000
27.866	0.000	0.00	0.00	0.00	0.0	0.000
27.883	0.000	0.00	0.00	0.00	0.0	0.000
27.900	0.000	0.00	0.00	0.00	0.0	0.000
27.916	0.000	0.00	0.00	0.00	0.0	0.000
27.933	0.000	0.00	0.00	0.00	0.0	0.000
27.950	0.000	0.00	0.00	0.00	0.0	0.000
27.966	0.000	0.00	0.00	0.00	0.0	0.000
27.983	0.000	0.00	0.00	0.00	0.0	0.000
28.000	0.000	0.00	0.00	0.00	0.0	0.000
28.016	0.000	0.00	0.00	0.00	0.0	0.000
28.033	0.000	0.00	0.00	0.00	0.0	0.000
28.050	0.000	0.00	0.00	0.00	0.0	0.000
28.066	0.000	0.00	0.00	0.00	0.0	0.000
28.083	0.000	0.00	0.00	0.00	0.0	0.000
28.100	0.000	0.00	0.00	0.00	0.0	0.000
28.116	0.000	0.00	0.00	0.00	0.0	0.000
28.133	0.000	0.00	0.00	0.00	0.0	0.000
28.150	0.000	0.00	0.00	0.00	0.0	0.000
28.166	0.000	0.00	0.00	0.00	0.0	0.000
28.183	0.000	0.00	0.00	0.00	0.0	0.000
28.200	0.000	0.00	0.00	0.00	0.0	0.000
28.216	0.000	0.00	0.00	0.00	0.0	0.000
28.233	0.000	0.00	0.00	0.00	0.0	0.000
28.250	0.000	0.00	0.00	0.00	0.0	0.000
28.266	0.000	0.00	0.00	0.00	0.0	0.000
28.283	0.000	0.00	0.00	0.00	0.0	0.000
28.300	0.000	0.00	0.00	0.00	0.0	0.000
28.316	0.000	0.00	0.00	0.00	0.0	0.000
28.333	0.000	0.00	0.00	0.00	0.0	0.000
28.350	0.000	0.00	0.00	0.00	0.0	0.000
28.366	0.000	0.00	0.00	0.00	0.0	0.000
28.383	0.000	0.00	0.00	0.00	0.0	0.000
28.400	0.000	0.00	0.00	0.00	0.0	0.000
28.416	0.000	0.00	0.00	0.00	0.0	0.000

28.433	0.000	0.00	0.00	0.00	0.0	0.000
28.450	0.000	0.00	0.00	0.00	0.0	0.000
28.466	0.000	0.00	0.00	0.00	0.0	0.000
28.483	0.000	0.00	0.00	0.00	0.0	0.000
28.500	0.000	0.00	0.00	0.00	0.0	0.000
28.516	0.000	0.00	0.00	0.00	0.0	0.000
28.533	0.000	0.00	0.00	0.00	0.0	0.000
28.550	0.000	0.00	0.00	0.00	0.0	0.000
28.566	0.000	0.00	0.00	0.00	0.0	0.000
28.583	0.000	0.00	0.00	0.00	0.0	0.000
28.600	0.000	0.00	0.00	0.00	0.0	0.000
28.616	0.000	0.00	0.00	0.00	0.0	0.000
28.633	0.000	0.00	0.00	0.00	0.0	0.000
28.650	0.000	0.00	0.00	0.00	0.0	0.000
28.666	0.000	0.00	0.00	0.00	0.0	0.000
28.683	0.000	0.00	0.00	0.00	0.0	0.000
28.700	0.000	0.00	0.00	0.00	0.0	0.000
28.716	0.000	0.00	0.00	0.00	0.0	0.000
28.733	0.000	0.00	0.00	0.00	0.0	0.000
28.750	0.000	0.00	0.00	0.00	0.0	0.000
28.766	0.000	0.00	0.00	0.00	0.0	0.000
28.783	0.000	0.00	0.00	0.00	0.0	0.000
28.800	0.000	0.00	0.00	0.00	0.0	0.000
28.816	0.000	0.00	0.00	0.00	0.0	0.000
28.833	0.000	0.00	0.00	0.00	0.0	0.000
28.850	0.000	0.00	0.00	0.00	0.0	0.000
28.866	0.000	0.00	0.00	0.00	0.0	0.000
28.883	0.000	0.00	0.00	0.00	0.0	0.000
28.900	0.000	0.00	0.00	0.00	0.0	0.000
28.916	0.000	0.00	0.00	0.00	0.0	0.000
28.933	0.000	0.00	0.00	0.00	0.0	0.000
28.950	0.000	0.00	0.00	0.00	0.0	0.000
28.966	0.000	0.00	0.00	0.00	0.0	0.000
28.983	0.000	0.00	0.00	0.00	0.0	0.000
29.000	0.000	0.00	0.00	0.00	0.0	0.000
29.016	0.000	0.00	0.00	0.00	0.0	0.000
29.033	0.000	0.00	0.00	0.00	0.0	0.000
29.050	0.000	0.00	0.00	0.00	0.0	0.000
29.066	0.000	0.00	0.00	0.00	0.0	0.000
29.083	0.000	0.00	0.00	0.00	0.0	0.000
29.100	0.000	0.00	0.00	0.00	0.0	0.000
29.116	0.000	0.00	0.00	0.00	0.0	0.000
29.133	0.000	0.00	0.00	0.00	0.0	0.000
29.150	0.000	0.00	0.00	0.00	0.0	0.000
29.166	0.000	0.00	0.00	0.00	0.0	0.000
29.183	0.000	0.00	0.00	0.00	0.0	0.000
29.200	0.000	0.00	0.00	0.00	0.0	0.000
29.216	0.000	0.00	0.00	0.00	0.0	0.000
29.233	0.000	0.00	0.00	0.00	0.0	0.000
29.250	0.000	0.00	0.00	0.00	0.0	0.000
29.266	0.000	0.00	0.00	0.00	0.0	0.000
29.283	0.000	0.00	0.00	0.00	0.0	0.000
29.300	0.000	0.00	0.00	0.00	0.0	0.000
29.316	0.000	0.00	0.00	0.00	0.0	0.000
29.333	0.000	0.00	0.00	0.00	0.0	0.000
29.350	0.000	0.00	0.00	0.00	0.0	0.000
29.366	0.000	0.00	0.00	0.00	0.0	0.000
29.383	0.000	0.00	0.00	0.00	0.0	0.000
29.400	0.000	0.00	0.00	0.00	0.0	0.000
29.416	0.000	0.00	0.00	0.00	0.0	0.000
29.433	0.000	0.00	0.00	0.00	0.0	0.000
29.450	0.000	0.00	0.00	0.00	0.0	0.000
29.466	0.000	0.00	0.00	0.00	0.0	0.000
29.483	0.000	0.00	0.00	0.00	0.0	0.000
29.500	0.000	0.00	0.00	0.00	0.0	0.000
29.516	0.000	0.00	0.00	0.00	0.0	0.000
29.533	0.000	0.00	0.00	0.00	0.0	0.000
29.550	0.000	0.00	0.00	0.00	0.0	0.000
29.566	0.000	0.00	0.00	0.00	0.0	0.000
29.583	0.000	0.00	0.00	0.00	0.0	0.000
29.600	0.000	0.00	0.00	0.00	0.0	0.000
29.616	0.000	0.00	0.00	0.00	0.0	0.000
29.633	0.000	0.00	0.00	0.00	0.0	0.000
29.650	0.000	0.00	0.00	0.00	0.0	0.000
29.666	0.000	0.00	0.00	0.00	0.0	0.000
29.683	0.000	0.00	0.00	0.00	0.0	0.000
29.700	0.000	0.00	0.00	0.00	0.0	0.000
29.716	0.000	0.00	0.00	0.00	0.0	0.000
29.733	0.000	0.00	0.00	0.00	0.0	0.000

29.750	0.000	0.00	0.00	0.00	0.0	0.000
29.766	0.000	0.00	0.00	0.00	0.0	0.000
29.783	0.000	0.00	0.00	0.00	0.0	0.000
29.800	0.000	0.00	0.00	0.00	0.0	0.000
29.816	0.000	0.00	0.00	0.00	0.0	0.000
29.833	0.000	0.00	0.00	0.00	0.0	0.000
29.850	0.000	0.00	0.00	0.00	0.0	0.000
29.866	0.000	0.00	0.00	0.00	0.0	0.000
29.883	0.000	0.00	0.00	0.00	0.0	0.000
29.900	0.000	0.00	0.00	0.00	0.0	0.000
29.916	0.000	0.00	0.00	0.00	0.0	0.000
29.933	0.000	0.00	0.00	0.00	0.0	0.000
29.950	0.000	0.00	0.00	0.00	0.0	0.000
29.966	0.000	0.00	0.00	0.00	0.0	0.000
29.983	0.000	0.00	0.00	0.00	0.0	0.000
30.000	0.000	0.00	0.00	0.00	0.0	0.000
30.016	0.000	0.00	0.00	0.00	0.0	0.000
30.033	0.000	0.00	0.00	0.00	0.0	0.000
30.050	0.000	0.00	0.00	0.00	0.0	0.000
30.066	0.000	0.00	0.00	0.00	0.0	0.000
30.083	0.000	0.00	0.00	0.00	0.0	0.000
30.100	0.000	0.00	0.00	0.00	0.0	0.000
30.116	0.000	0.00	0.00	0.00	0.0	0.000
30.133	0.000	0.00	0.00	0.00	0.0	0.000
30.150	0.000	0.00	0.00	0.00	0.0	0.000
30.166	0.000	0.00	0.00	0.00	0.0	0.000
30.183	0.000	0.00	0.00	0.00	0.0	0.000
30.200	0.000	0.00	0.00	0.00	0.0	0.000
30.216	0.000	0.00	0.00	0.00	0.0	0.000
30.233	0.000	0.00	0.00	0.00	0.0	0.000
30.250	0.000	0.00	0.00	0.00	0.0	0.000
30.266	0.000	0.00	0.00	0.00	0.0	0.000
30.283	0.000	0.00	0.00	0.00	0.0	0.000
30.300	0.000	0.00	0.00	0.00	0.0	0.000
30.316	0.000	0.00	0.00	0.00	0.0	0.000
30.333	0.000	0.00	0.00	0.00	0.0	0.000
30.350	0.000	0.00	0.00	0.00	0.0	0.000
30.366	0.000	0.00	0.00	0.00	0.0	0.000
30.383	0.000	0.00	0.00	0.00	0.0	0.000
30.400	0.000	0.00	0.00	0.00	0.0	0.000
30.416	0.000	0.00	0.00	0.00	0.0	0.000
30.433	0.000	0.00	0.00	0.00	0.0	0.000
30.450	0.000	0.00	0.00	0.00	0.0	0.000
30.466	0.000	0.00	0.00	0.00	0.0	0.000
30.483	0.000	0.00	0.00	0.00	0.0	0.000
30.500	0.000	0.00	0.00	0.00	0.0	0.000
30.516	0.000	0.00	0.00	0.00	0.0	0.000
30.533	0.000	0.00	0.00	0.00	0.0	0.000
30.550	0.000	0.00	0.00	0.00	0.0	0.000
30.566	0.000	0.00	0.00	0.00	0.0	0.000
30.583	0.000	0.00	0.00	0.00	0.0	0.000
30.600	0.000	0.00	0.00	0.00	0.0	0.000
30.616	0.000	0.00	0.00	0.00	0.0	0.000
30.633	0.000	0.00	0.00	0.00	0.0	0.000
30.650	0.000	0.00	0.00	0.00	0.0	0.000
30.666	0.000	0.00	0.00	0.00	0.0	0.000
30.683	0.000	0.00	0.00	0.00	0.0	0.000
30.700	0.000	0.00	0.00	0.00	0.0	0.000
30.716	0.000	0.00	0.00	0.00	0.0	0.000
30.733	0.000	0.00	0.00	0.00	0.0	0.000
30.750	0.000	0.00	0.00	0.00	0.0	0.000
30.766	0.000	0.00	0.00	0.00	0.0	0.000
30.783	0.000	0.00	0.00	0.00	0.0	0.000
30.800	0.000	0.00	0.00	0.00	0.0	0.000
30.816	0.000	0.00	0.00	0.00	0.0	0.000
30.833	0.000	0.00	0.00	0.00	0.0	0.000
30.850	0.000	0.00	0.00	0.00	0.0	0.000
30.866	0.000	0.00	0.00	0.00	0.0	0.000
30.883	0.000	0.00	0.00	0.00	0.0	0.000
30.900	0.000	0.00	0.00	0.00	0.0	0.000
30.916	0.000	0.00	0.00	0.00	0.0	0.000
30.933	0.000	0.00	0.00	0.00	0.0	0.000
30.950	0.000	0.00	0.00	0.00	0.0	0.000
30.966	0.000	0.00	0.00	0.00	0.0	0.000
30.983	0.000	0.00	0.00	0.00	0.0	0.000
31.000	0.000	0.00	0.00	0.00	0.0	0.000
31.016	0.000	0.00	0.00	0.00	0.0	0.000
31.033	0.000	0.00	0.00	0.00	0.0	0.000
31.050	0.000	0.00	0.00	0.00	0.0	0.000

31.066	0.000	0.00	0.00	0.00	0.0	0.000
31.083	0.000	0.00	0.00	0.00	0.0	0.000
31.100	0.000	0.00	0.00	0.00	0.0	0.000
31.116	0.000	0.00	0.00	0.00	0.0	0.000
31.133	0.000	0.00	0.00	0.00	0.0	0.000
31.150	0.000	0.00	0.00	0.00	0.0	0.000
31.166	0.000	0.00	0.00	0.00	0.0	0.000
31.183	0.000	0.00	0.00	0.00	0.0	0.000
31.200	0.000	0.00	0.00	0.00	0.0	0.000
31.216	0.000	0.00	0.00	0.00	0.0	0.000
31.233	0.000	0.00	0.00	0.00	0.0	0.000
31.250	0.000	0.00	0.00	0.00	0.0	0.000
31.266	0.000	0.00	0.00	0.00	0.0	0.000
31.283	0.000	0.00	0.00	0.00	0.0	0.000
31.300	0.000	0.00	0.00	0.00	0.0	0.000
31.316	0.000	0.00	0.00	0.00	0.0	0.000
31.333	0.000	0.00	0.00	0.00	0.0	0.000
31.350	0.000	0.00	0.00	0.00	0.0	0.000
31.366	0.000	0.00	0.00	0.00	0.0	0.000
31.383	0.000	0.00	0.00	0.00	0.0	0.000
31.400	0.000	0.00	0.00	0.00	0.0	0.000
31.416	0.000	0.00	0.00	0.00	0.0	0.000
31.433	0.000	0.00	0.00	0.00	0.0	0.000
31.450	0.000	0.00	0.00	0.00	0.0	0.000
31.466	0.000	0.00	0.00	0.00	0.0	0.000
31.483	0.000	0.00	0.00	0.00	0.0	0.000
31.500	0.000	0.00	0.00	0.00	0.0	0.000
31.516	0.000	0.00	0.00	0.00	0.0	0.000
31.533	0.000	0.00	0.00	0.00	0.0	0.000
31.550	0.000	0.00	0.00	0.00	0.0	0.000
31.566	0.000	0.00	0.00	0.00	0.0	0.000
31.583	0.000	0.00	0.00	0.00	0.0	0.000
31.600	0.000	0.00	0.00	0.00	0.0	0.000
31.616	0.000	0.00	0.00	0.00	0.0	0.000
31.633	0.000	0.00	0.00	0.00	0.0	0.000
31.650	0.000	0.00	0.00	0.00	0.0	0.000
31.666	0.000	0.00	0.00	0.00	0.0	0.000
31.683	0.000	0.00	0.00	0.00	0.0	0.000
31.700	0.000	0.00	0.00	0.00	0.0	0.000
31.716	0.000	0.00	0.00	0.00	0.0	0.000
31.733	0.000	0.00	0.00	0.00	0.0	0.000
31.750	0.000	0.00	0.00	0.00	0.0	0.000
31.766	0.000	0.00	0.00	0.00	0.0	0.000
31.783	0.000	0.00	0.00	0.00	0.0	0.000
31.800	0.000	0.00	0.00	0.00	0.0	0.000
31.816	0.000	0.00	0.00	0.00	0.0	0.000
31.833	0.000	0.00	0.00	0.00	0.0	0.000
31.850	0.000	0.00	0.00	0.00	0.0	0.000
31.866	0.000	0.00	0.00	0.00	0.0	0.000
31.883	0.000	0.00	0.00	0.00	0.0	0.000
31.900	0.000	0.00	0.00	0.00	0.0	0.000
31.916	0.000	0.00	0.00	0.00	0.0	0.000
31.933	0.000	0.00	0.00	0.00	0.0	0.000
31.950	0.000	0.00	0.00	0.00	0.0	0.000
31.966	0.000	0.00	0.00	0.00	0.0	0.000
31.983	0.000	0.00	0.00	0.00	0.0	0.000
32.000	0.000	0.00	0.00	0.00	0.0	0.000
32.016	0.000	0.00	0.00	0.00	0.0	0.000
32.033	0.000	0.00	0.00	0.00	0.0	0.000
32.050	0.000	0.00	0.00	0.00	0.0	0.000
32.066	0.000	0.00	0.00	0.00	0.0	0.000
32.083	0.000	0.00	0.00	0.00	0.0	0.000
32.100	0.000	0.00	0.00	0.00	0.0	0.000
32.116	0.000	0.00	0.00	0.00	0.0	0.000
32.133	0.000	0.00	0.00	0.00	0.0	0.000
32.150	0.000	0.00	0.00	0.00	0.0	0.000
32.166	0.000	0.00	0.00	0.00	0.0	0.000
32.183	0.000	0.00	0.00	0.00	0.0	0.000
32.200	0.000	0.00	0.00	0.00	0.0	0.000
32.216	0.000	0.00	0.00	0.00	0.0	0.000
32.233	0.000	0.00	0.00	0.00	0.0	0.000
32.250	0.000	0.00	0.00	0.00	0.0	0.000
32.266	0.000	0.00	0.00	0.00	0.0	0.000
32.283	0.000	0.00	0.00	0.00	0.0	0.000
32.300	0.000	0.00	0.00	0.00	0.0	0.000
32.316	0.000	0.00	0.00	0.00	0.0	0.000
32.333	0.000	0.00	0.00	0.00	0.0	0.000
32.350	0.000	0.00	0.00	0.00	0.0	0.000
32.366	0.000	0.00	0.00	0.00	0.0	0.000

32.383	0.000	0.00	0.00	0.00	0.0	0.000
32.400	0.000	0.00	0.00	0.00	0.0	0.000
32.416	0.000	0.00	0.00	0.00	0.0	0.000
32.433	0.000	0.00	0.00	0.00	0.0	0.000
32.450	0.000	0.00	0.00	0.00	0.0	0.000
32.466	0.000	0.00	0.00	0.00	0.0	0.000
32.483	0.000	0.00	0.00	0.00	0.0	0.000
32.500	0.000	0.00	0.00	0.00	0.0	0.000
32.516	0.000	0.00	0.00	0.00	0.0	0.000
32.533	0.000	0.00	0.00	0.00	0.0	0.000
32.550	0.000	0.00	0.00	0.00	0.0	0.000
32.566	0.000	0.00	0.00	0.00	0.0	0.000
32.583	0.000	0.00	0.00	0.00	0.0	0.000
32.600	0.000	0.00	0.00	0.00	0.0	0.000
32.616	0.000	0.00	0.00	0.00	0.0	0.000
32.633	0.000	0.00	0.00	0.00	0.0	0.000
32.650	0.000	0.00	0.00	0.00	0.0	0.000
32.666	0.000	0.00	0.00	0.00	0.0	0.000
32.683	0.000	0.00	0.00	0.00	0.0	0.000
32.700	0.000	0.00	0.00	0.00	0.0	0.000
32.716	0.000	0.00	0.00	0.00	0.0	0.000
32.733	0.000	0.00	0.00	0.00	0.0	0.000
32.750	0.000	0.00	0.00	0.00	0.0	0.000
32.766	0.000	0.00	0.00	0.00	0.0	0.000
32.783	0.000	0.00	0.00	0.00	0.0	0.000
32.800	0.000	0.00	0.00	0.00	0.0	0.000
32.816	0.000	0.00	0.00	0.00	0.0	0.000
32.833	0.000	0.00	0.00	0.00	0.0	0.000
32.850	0.000	0.00	0.00	0.00	0.0	0.000
32.866	0.000	0.00	0.00	0.00	0.0	0.000
32.883	0.000	0.00	0.00	0.00	0.0	0.000
32.900	0.000	0.00	0.00	0.00	0.0	0.000
32.916	0.000	0.00	0.00	0.00	0.0	0.000
32.933	0.000	0.00	0.00	0.00	0.0	0.000
32.950	0.000	0.00	0.00	0.00	0.0	0.000
32.966	0.000	0.00	0.00	0.00	0.0	0.000
32.983	0.000	0.00	0.00	0.00	0.0	0.000
33.000	0.000	0.00	0.00	0.00	0.0	0.000
33.016	0.000	0.00	0.00	0.00	0.0	0.000
33.033	0.000	0.00	0.00	0.00	0.0	0.000
33.050	0.000	0.00	0.00	0.00	0.0	0.000
33.066	0.000	0.00	0.00	0.00	0.0	0.000
33.083	0.000	0.00	0.00	0.00	0.0	0.000
33.100	0.000	0.00	0.00	0.00	0.0	0.000
33.116	0.000	0.00	0.00	0.00	0.0	0.000
33.133	0.000	0.00	0.00	0.00	0.0	0.000
33.150	0.000	0.00	0.00	0.00	0.0	0.000
33.166	0.000	0.00	0.00	0.00	0.0	0.000
33.183	0.000	0.00	0.00	0.00	0.0	0.000
33.200	0.000	0.00	0.00	0.00	0.0	0.000
33.216	0.000	0.00	0.00	0.00	0.0	0.000
33.233	0.000	0.00	0.00	0.00	0.0	0.000
33.250	0.000	0.00	0.00	0.00	0.0	0.000
33.266	0.000	0.00	0.00	0.00	0.0	0.000
33.283	0.000	0.00	0.00	0.00	0.0	0.000
33.300	0.000	0.00	0.00	0.00	0.0	0.000
33.316	0.000	0.00	0.00	0.00	0.0	0.000
33.333	0.000	0.00	0.00	0.00	0.0	0.000
33.350	0.000	0.00	0.00	0.00	0.0	0.000
33.366	0.000	0.00	0.00	0.00	0.0	0.000
33.383	0.000	0.00	0.00	0.00	0.0	0.000
33.400	0.000	0.00	0.00	0.00	0.0	0.000
33.416	0.000	0.00	0.00	0.00	0.0	0.000
33.433	0.000	0.00	0.00	0.00	0.0	0.000
33.450	0.000	0.00	0.00	0.00	0.0	0.000
33.466	0.000	0.00	0.00	0.00	0.0	0.000
33.483	0.000	0.00	0.00	0.00	0.0	0.000
33.500	0.000	0.00	0.00	0.00	0.0	0.000
33.516	0.000	0.00	0.00	0.00	0.0	0.000
33.533	0.000	0.00	0.00	0.00	0.0	0.000
33.550	0.000	0.00	0.00	0.00	0.0	0.000
33.566	0.000	0.00	0.00	0.00	0.0	0.000
33.583	0.000	0.00	0.00	0.00	0.0	0.000
33.600	0.000	0.00	0.00	0.00	0.0	0.000
33.616	0.000	0.00	0.00	0.00	0.0	0.000
33.633	0.000	0.00	0.00	0.00	0.0	0.000
33.650	0.000	0.00	0.00	0.00	0.0	0.000
33.666	0.000	0.00	0.00	0.00	0.0	0.000
33.683	0.000	0.00	0.00	0.00	0.0	0.000

33.700	0.000	0.00	0.00	0.00	0.0	0.000
33.716	0.000	0.00	0.00	0.00	0.0	0.000
33.733	0.000	0.00	0.00	0.00	0.0	0.000
33.750	0.000	0.00	0.00	0.00	0.0	0.000
33.766	0.000	0.00	0.00	0.00	0.0	0.000
33.783	0.000	0.00	0.00	0.00	0.0	0.000
33.800	0.000	0.00	0.00	0.00	0.0	0.000
33.816	0.000	0.00	0.00	0.00	0.0	0.000
33.833	0.000	0.00	0.00	0.00	0.0	0.000
33.850	0.000	0.00	0.00	0.00	0.0	0.000
33.866	0.000	0.00	0.00	0.00	0.0	0.000
33.883	0.000	0.00	0.00	0.00	0.0	0.000
33.900	0.000	0.00	0.00	0.00	0.0	0.000
33.916	0.000	0.00	0.00	0.00	0.0	0.000
33.933	0.000	0.00	0.00	0.00	0.0	0.000
33.950	0.000	0.00	0.00	0.00	0.0	0.000
33.966	0.000	0.00	0.00	0.00	0.0	0.000
33.983	0.000	0.00	0.00	0.00	0.0	0.000
34.000	0.000	0.00	0.00	0.00	0.0	0.000
34.016	0.000	0.00	0.00	0.00	0.0	0.000
34.033	0.000	0.00	0.00	0.00	0.0	0.000
34.050	0.000	0.00	0.00	0.00	0.0	0.000
34.066	0.000	0.00	0.00	0.00	0.0	0.000
34.083	0.000	0.00	0.00	0.00	0.0	0.000
34.100	0.000	0.00	0.00	0.00	0.0	0.000
34.116	0.000	0.00	0.00	0.00	0.0	0.000
34.133	0.000	0.00	0.00	0.00	0.0	0.000
34.150	0.000	0.00	0.00	0.00	0.0	0.000
34.166	0.000	0.00	0.00	0.00	0.0	0.000
34.183	0.000	0.00	0.00	0.00	0.0	0.000
34.200	0.000	0.00	0.00	0.00	0.0	0.000
34.216	0.000	0.00	0.00	0.00	0.0	0.000
34.233	0.000	0.00	0.00	0.00	0.0	0.000
34.250	0.000	0.00	0.00	0.00	0.0	0.000
34.266	0.000	0.00	0.00	0.00	0.0	0.000
34.283	0.000	0.00	0.00	0.00	0.0	0.000
34.300	0.000	0.00	0.00	0.00	0.0	0.000
34.316	0.000	0.00	0.00	0.00	0.0	0.000
34.333	0.000	0.00	0.00	0.00	0.0	0.000
34.350	0.000	0.00	0.00	0.00	0.0	0.000
34.366	0.000	0.00	0.00	0.00	0.0	0.000
34.383	0.000	0.00	0.00	0.00	0.0	0.000
34.400	0.000	0.00	0.00	0.00	0.0	0.000
34.416	0.000	0.00	0.00	0.00	0.0	0.000
34.433	0.000	0.00	0.00	0.00	0.0	0.000
34.450	0.000	0.00	0.00	0.00	0.0	0.000
34.466	0.000	0.00	0.00	0.00	0.0	0.000
34.483	0.000	0.00	0.00	0.00	0.0	0.000
34.500	0.000	0.00	0.00	0.00	0.0	0.000
34.516	0.000	0.00	0.00	0.00	0.0	0.000
34.533	0.000	0.00	0.00	0.00	0.0	0.000
34.550	0.000	0.00	0.00	0.00	0.0	0.000
34.566	0.000	0.00	0.00	0.00	0.0	0.000
34.583	0.000	0.00	0.00	0.00	0.0	0.000
34.600	0.000	0.00	0.00	0.00	0.0	0.000
34.616	0.000	0.00	0.00	0.00	0.0	0.000
34.633	0.000	0.00	0.00	0.00	0.0	0.000
34.650	0.000	0.00	0.00	0.00	0.0	0.000
34.666	0.000	0.00	0.00	0.00	0.0	0.000
34.683	0.000	0.00	0.00	0.00	0.0	0.000
34.700	0.000	0.00	0.00	0.00	0.0	0.000
34.716	0.000	0.00	0.00	0.00	0.0	0.000
34.733	0.000	0.00	0.00	0.00	0.0	0.000
34.750	0.000	0.00	0.00	0.00	0.0	0.000
34.766	0.000	0.00	0.00	0.00	0.0	0.000
34.783	0.000	0.00	0.00	0.00	0.0	0.000
34.800	0.000	0.00	0.00	0.00	0.0	0.000
34.816	0.000	0.00	0.00	0.00	0.0	0.000
34.833	0.000	0.00	0.00	0.00	0.0	0.000
34.850	0.000	0.00	0.00	0.00	0.0	0.000
34.866	0.000	0.00	0.00	0.00	0.0	0.000
34.883	0.000	0.00	0.00	0.00	0.0	0.000
34.900	0.000	0.00	0.00	0.00	0.0	0.000
34.916	0.000	0.00	0.00	0.00	0.0	0.000
34.933	0.000	0.00	0.00	0.00	0.0	0.000
34.950	0.000	0.00	0.00	0.00	0.0	0.000
34.966	0.000	0.00	0.00	0.00	0.0	0.000
34.983	0.000	0.00	0.00	0.00	0.0	0.000
35.000	0.000	0.00	0.00	0.00	0.0	0.000

35.016	0.000	0.00	0.00	0.00	0.0	0.000
35.033	0.000	0.00	0.00	0.00	0.0	0.000
35.050	0.000	0.00	0.00	0.00	0.0	0.000
35.066	0.000	0.00	0.00	0.00	0.0	0.000
35.083	0.000	0.00	0.00	0.00	0.0	0.000
35.100	0.000	0.00	0.00	0.00	0.0	0.000
35.116	0.000	0.00	0.00	0.00	0.0	0.000
35.133	0.000	0.00	0.00	0.00	0.0	0.000
35.150	0.000	0.00	0.00	0.00	0.0	0.000
35.166	0.000	0.00	0.00	0.00	0.0	0.000
35.183	0.000	0.00	0.00	0.00	0.0	0.000
35.200	0.000	0.00	0.00	0.00	0.0	0.000
35.216	0.000	0.00	0.00	0.00	0.0	0.000
35.233	0.000	0.00	0.00	0.00	0.0	0.000
35.250	0.000	0.00	0.00	0.00	0.0	0.000
35.266	0.000	0.00	0.00	0.00	0.0	0.000
35.283	0.000	0.00	0.00	0.00	0.0	0.000
35.300	0.000	0.00	0.00	0.00	0.0	0.000
35.316	0.000	0.00	0.00	0.00	0.0	0.000
35.333	0.000	0.00	0.00	0.00	0.0	0.000
35.350	0.000	0.00	0.00	0.00	0.0	0.000
35.366	0.000	0.00	0.00	0.00	0.0	0.000
35.383	0.000	0.00	0.00	0.00	0.0	0.000
35.400	0.000	0.00	0.00	0.00	0.0	0.000
35.416	0.000	0.00	0.00	0.00	0.0	0.000
35.433	0.000	0.00	0.00	0.00	0.0	0.000
35.450	0.000	0.00	0.00	0.00	0.0	0.000
35.466	0.000	0.00	0.00	0.00	0.0	0.000
35.483	0.000	0.00	0.00	0.00	0.0	0.000
35.500	0.000	0.00	0.00	0.00	0.0	0.000
35.516	0.000	0.00	0.00	0.00	0.0	0.000
35.533	0.000	0.00	0.00	0.00	0.0	0.000
35.550	0.000	0.00	0.00	0.00	0.0	0.000
35.566	0.000	0.00	0.00	0.00	0.0	0.000
35.583	0.000	0.00	0.00	0.00	0.0	0.000
35.600	0.000	0.00	0.00	0.00	0.0	0.000
35.616	0.000	0.00	0.00	0.00	0.0	0.000
35.633	0.000	0.00	0.00	0.00	0.0	0.000
35.650	0.000	0.00	0.00	0.00	0.0	0.000
35.666	0.000	0.00	0.00	0.00	0.0	0.000
35.683	0.000	0.00	0.00	0.00	0.0	0.000
35.700	0.000	0.00	0.00	0.00	0.0	0.000
35.716	0.000	0.00	0.00	0.00	0.0	0.000
35.733	0.000	0.00	0.00	0.00	0.0	0.000
35.750	0.000	0.00	0.00	0.00	0.0	0.000
35.766	0.000	0.00	0.00	0.00	0.0	0.000
35.783	0.000	0.00	0.00	0.00	0.0	0.000
35.800	0.000	0.00	0.00	0.00	0.0	0.000
35.816	0.000	0.00	0.00	0.00	0.0	0.000
35.833	0.000	0.00	0.00	0.00	0.0	0.000
35.850	0.000	0.00	0.00	0.00	0.0	0.000
35.866	0.000	0.00	0.00	0.00	0.0	0.000
35.883	0.000	0.00	0.00	0.00	0.0	0.000
35.900	0.000	0.00	0.00	0.00	0.0	0.000
35.916	0.000	0.00	0.00	0.00	0.0	0.000
35.933	0.000	0.00	0.00	0.00	0.0	0.000
35.950	0.000	0.00	0.00	0.00	0.0	0.000
35.966	0.000	0.00	0.00	0.00	0.0	0.000
35.983	0.000	0.00	0.00	0.00	0.0	0.000
36.000	0.000	0.00	0.00	0.00	0.0	0.000

PROCESS SUMMARY OF STORAGE:

INFLOW VOLUME = 6.128 AF

BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)

OUTFLOW VOLUME = 6.129 AF

LOSS VOLUME = 0.000 AF

==========

END OF FLOODSCx ROUTING ANALYSIS

Arrow Rt. and Juneberry Dr. - Rancho Cucamonga
Basin Rating Curve

Building 5 - Nodes 230-238 - Line E Sta. 17+65.17

Elevation (ft)	Depth (ft)	Storage (cu-ft)	Storage (ac-ft)	Type SD Orifice C 0.60 Storm Drain Diameter (in) 18 Invert (ft) 1122.55 Discharge (cfs)
1130.11	0.00	0	0.000	23.395
1130.21	0.10	129	0.003	23.549
1130.31	0.20	649	0.015	23.703
1130.41	0.30	2,307	0.053	23.855
1130.51	0.40	5,246	0.120	24.006
1130.61	0.50	9,456	0.217	24.157
1130.71	0.60	14,822	0.340	24.306
1130.81	0.70	21,218	0.487	24.454
1130.91	0.80	28,532	0.655	24.602

```
______________________________________________________________________________
******************************************************************************

            F L O O D    R O U T I N G    A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2016 Advanced Engineering Software (aes)
            Ver. 23.0  Release Date: 07/01/2016  License ID 1435

                        Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* ARROW RT. AND JUNEBERRY DR. - RANCHO CUCAMONGA                         *
* PROPOSED CONDITION - BUILDING 5 - NODES 230-238                        *
* HYDROLOGIC ANALYSIS - 100-YEAR                                         *
 ************************************************************************

  FILE NAME: 4021P2BC.FLD
  TIME/DATE OF STUDY: 10:00 11/09/2023

   The Small Area Unit Hydrograph Procedures in Section J
   of the Hydrology Manual provides estimates of runoff
   hydrograph and runoff volume for watersheds whose time of
   concentration is less than 25 minutes. The PROGRAM User
   should check the applicability of using the small area unit
   hydrograph procedures, and follow the guidelines in
   Sections J and K.5 in complex watershed modeling.


******************************************************************************
  FLOW PROCESS FROM NODE    230.00 TO NODE    238.00 IS CODE = 1.2
------------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (SMALL AREA UNIT-HYDROGRAPH ANALYSIS) <<<<<
==============================================================================

  (SMALL AREA UNIT-HYDROGRAPH ADDED TO STREAM #1)

    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    8.90
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.074
    LOW LOSS FRACTION = 0.126
    TIME OF CONCENTRATION(MIN.) =  7.50
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED:
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.51
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  1.05
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.40
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.50
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  8.20

------------------------------------------------------------------------------
    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     4.82
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.26

------------------------------------------------------------------------------
♠
==============================================================================

                      2 4 - H O U R    S T O R M
                   R U N O F F    H Y D R O G R A P H

==============================================================================
              HYDROGRAPH IN  ONE-MINUTE UNIT INTERVALS(CFS)
        (Notes: Time indicated is at END of Each Unit Intervals.
                Peak 5-minute rainfall intensity is modeled as
                a constant value for entire 5-minute period.)
------------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        9.5      18.9      28.4      37.9
------------------------------------------------------------------------------
   0.017      0.0001      0.09  Q         .         .         .         .
   0.033      0.0005      0.27  Q         .         .         .         .
   0.050      0.0011      0.45  Q         .         .         .         .
   0.067      0.0020      0.63  Q         .         .         .         .
```

0.083	0.0031	0.81	Q	.	.	.	.
0.100	0.0045	0.99	VQ	.	.	.	.
0.117	0.0061	1.17	VQ	.	.	.	.
0.133	0.0079	1.33	VQ	.	.	.	.
0.150	0.0098	1.35	VQ	.	.	.	.
0.167	0.0116	1.35	VQ	.	.	.	.
0.183	0.0135	1.35	VQ	.	.	.	.
0.200	0.0154	1.35	VQ	.	.	.	.
0.217	0.0172	1.35	VQ	.	.	.	.
0.233	0.0191	1.35	VQ	.	.	.	.
0.250	0.0210	1.35	VQ	.	.	.	.
0.267	0.0228	1.35	VQ	.	.	.	.
0.283	0.0247	1.36	VQ	.	.	.	.
0.300	0.0266	1.36	VQ	.	.	.	.
0.317	0.0284	1.36	VQ	.	.	.	.
0.333	0.0303	1.36	VQ	.	.	.	.
0.350	0.0322	1.36	VQ	.	.	.	.
0.367	0.0340	1.36	VQ	.	.	.	.
0.383	0.0359	1.36	VQ	.	.	.	.
0.400	0.0378	1.36	VQ	.	.	.	.
0.417	0.0397	1.36	VQ	.	.	.	.
0.433	0.0415	1.36	VQ	.	.	.	.
0.450	0.0434	1.36	VQ	.	.	.	.
0.467	0.0453	1.36	VQ	.	.	.	.
0.483	0.0472	1.36	VQ	.	.	.	.
0.500	0.0491	1.36	VQ	.	.	.	.
0.517	0.0509	1.36	VQ	.	.	.	.
0.533	0.0528	1.37	VQ	.	.	.	.
0.550	0.0547	1.37	VQ	.	.	.	.
0.567	0.0566	1.37	VQ	.	.	.	.
0.583	0.0585	1.37	VQ	.	.	.	.
0.600	0.0604	1.37	VQ	.	.	.	.
0.617	0.0622	1.37	VQ	.	.	.	.
0.633	0.0641	1.37	VQ	.	.	.	.
0.650	0.0660	1.37	VQ	.	.	.	.
0.667	0.0679	1.37	VQ	.	.	.	.
0.683	0.0698	1.37	VQ	.	.	.	.
0.700	0.0717	1.37	VQ	.	.	.	.
0.717	0.0736	1.37	VQ	.	.	.	.
0.733	0.0755	1.37	VQ	.	.	.	.
0.750	0.0774	1.37	VQ	.	.	.	.
0.767	0.0792	1.37	VQ	.	.	.	.
0.783	0.0811	1.37	VQ	.	.	.	.
0.800	0.0830	1.38	VQ	.	.	.	.
0.817	0.0849	1.38	VQ	.	.	.	.
0.833	0.0868	1.38	VQ	.	.	.	.
0.850	0.0887	1.38	VQ	.	.	.	.
0.867	0.0906	1.38	VQ	.	.	.	.
0.883	0.0925	1.38	VQ	.	.	.	.
0.900	0.0944	1.38	VQ	.	.	.	.
0.917	0.0963	1.38	VQ	.	.	.	.
0.933	0.0982	1.38	VQ	.	.	.	.
0.950	0.1001	1.38	VQ	.	.	.	.
0.967	0.1020	1.38	VQ	.	.	.	.
0.983	0.1039	1.38	VQ	.	.	.	.
1.000	0.1059	1.38	VQ	.	.	.	.
1.017	0.1078	1.38	VQ	.	.	.	.
1.033	0.1097	1.38	VQ	.	.	.	.
1.050	0.1116	1.39	VQ	.	.	.	.
1.067	0.1135	1.39	VQ	.	.	.	.
1.083	0.1154	1.39	VQ	.	.	.	.
1.100	0.1173	1.39	VQ	.	.	.	.
1.117	0.1192	1.39	VQ	.	.	.	.
1.133	0.1211	1.39	.Q	.	.	.	.
1.150	0.1231	1.39	.Q	.	.	.	.
1.167	0.1250	1.39	.Q	.	.	.	.
1.183	0.1269	1.39	.Q	.	.	.	.
1.200	0.1288	1.39	.Q	.	.	.	.
1.217	0.1307	1.39	.Q	.	.	.	.
1.233	0.1326	1.39	.Q	.	.	.	.
1.250	0.1346	1.39	.Q	.	.	.	.
1.267	0.1365	1.39	.Q	.	.	.	.
1.283	0.1384	1.39	.Q	.	.	.	.
1.300	0.1403	1.40	.Q	.	.	.	.
1.317	0.1422	1.40	.Q	.	.	.	.
1.333	0.1442	1.40	.Q	.	.	.	.
1.350	0.1461	1.40	.Q	.	.	.	.
1.367	0.1480	1.40	.Q	.	.	.	.
1.383	0.1500	1.40	.Q	.	.	.	.

1.400	0.1519	1.40	.Q	.	.	.	.
1.417	0.1538	1.40	.Q	.	.	.	.
1.433	0.1557	1.40	.Q	.	.	.	.
1.450	0.1577	1.40	.Q	.	.	.	.
1.467	0.1596	1.40	.Q	.	.	.	.
1.483	0.1615	1.40	.Q	.	.	.	.
1.500	0.1635	1.40	.Q	.	.	.	.
1.517	0.1654	1.40	.Q	.	.	.	.
1.533	0.1673	1.41	.Q	.	.	.	.
1.550	0.1693	1.41	.Q	.	.	.	.
1.567	0.1712	1.41	.Q	.	.	.	.
1.583	0.1732	1.41	.Q	.	.	.	.
1.600	0.1751	1.41	.Q	.	.	.	.
1.617	0.1770	1.41	.Q	.	.	.	.
1.633	0.1790	1.41	.Q	.	.	.	.
1.650	0.1809	1.41	.Q	.	.	.	.
1.667	0.1829	1.41	.Q	.	.	.	.
1.683	0.1848	1.41	.Q	.	.	.	.
1.700	0.1868	1.41	.Q	.	.	.	.
1.717	0.1887	1.41	.Q	.	.	.	.
1.733	0.1907	1.41	.Q	.	.	.	.
1.750	0.1926	1.41	.Q	.	.	.	.
1.767	0.1946	1.41	.Q	.	.	.	.
1.783	0.1965	1.42	.Q	.	.	.	.
1.800	0.1985	1.42	.Q	.	.	.	.
1.817	0.2004	1.42	.Q	.	.	.	.
1.833	0.2024	1.42	.Q	.	.	.	.
1.850	0.2043	1.42	.Q	.	.	.	.
1.867	0.2063	1.42	.Q	.	.	.	.
1.883	0.2082	1.42	.Q	.	.	.	.
1.900	0.2102	1.42	.Q	.	.	.	.
1.917	0.2121	1.42	.Q	.	.	.	.
1.933	0.2141	1.42	.Q	.	.	.	.
1.950	0.2161	1.42	.Q	.	.	.	.
1.967	0.2180	1.42	.Q	.	.	.	.
1.983	0.2200	1.42	.Q	.	.	.	.
2.000	0.2220	1.43	.Q	.	.	.	.
2.017	0.2239	1.43	.Q	.	.	.	.
2.033	0.2259	1.43	.Q	.	.	.	.
2.050	0.2279	1.43	.Q	.	.	.	.
2.067	0.2298	1.43	.Q	.	.	.	.
2.083	0.2318	1.43	.Q	.	.	.	.
2.100	0.2338	1.43	.Q	.	.	.	.
2.117	0.2357	1.43	.Q	.	.	.	.
2.133	0.2377	1.43	.Q	.	.	.	.
2.150	0.2397	1.43	.Q	.	.	.	.
2.167	0.2417	1.43	.QV	.	.	.	.
2.183	0.2436	1.43	.QV	.	.	.	.
2.200	0.2456	1.43	.QV	.	.	.	.
2.217	0.2476	1.44	.QV	.	.	.	.
2.233	0.2496	1.44	.QV	.	.	.	.
2.250	0.2515	1.44	.QV	.	.	.	.
2.267	0.2535	1.44	.QV	.	.	.	.
2.283	0.2555	1.44	.QV	.	.	.	.
2.300	0.2575	1.44	.QV	.	.	.	.
2.317	0.2595	1.44	.QV	.	.	.	.
2.333	0.2614	1.44	.QV	.	.	.	.
2.350	0.2634	1.44	.QV	.	.	.	.
2.367	0.2654	1.44	.QV	.	.	.	.
2.383	0.2674	1.44	.QV	.	.	.	.
2.400	0.2694	1.44	.QV	.	.	.	.
2.417	0.2714	1.45	.QV	.	.	.	.
2.433	0.2734	1.45	.QV	.	.	.	.
2.450	0.2754	1.45	.QV	.	.	.	.
2.467	0.2774	1.45	.QV	.	.	.	.
2.483	0.2794	1.45	.QV	.	.	.	.
2.500	0.2814	1.45	.QV	.	.	.	.
2.517	0.2833	1.45	.QV	.	.	.	.
2.533	0.2853	1.45	.QV	.	.	.	.
2.550	0.2873	1.45	.QV	.	.	.	.
2.567	0.2893	1.45	.QV	.	.	.	.
2.583	0.2913	1.45	.QV	.	.	.	.
2.600	0.2933	1.45	.QV	.	.	.	.
2.617	0.2953	1.45	.QV	.	.	.	.
2.633	0.2974	1.46	.QV	.	.	.	.
2.650	0.2994	1.46	.QV	.	.	.	.
2.667	0.3014	1.46	.QV	.	.	.	.
2.683	0.3034	1.46	.QV	.	.	.	.
2.700	0.3054	1.46	.QV	.	.	.	.

2.717	0.3074	1.46	.QV	.	.	.	.
2.733	0.3094	1.46	.QV	.	.	.	.
2.750	0.3114	1.46	.QV	.	.	.	.
2.767	0.3134	1.46	.QV	.	.	.	.
2.783	0.3154	1.46	.QV	.	.	.	.
2.800	0.3174	1.46	.QV	.	.	.	.
2.817	0.3195	1.46	.QV	.	.	.	.
2.833	0.3215	1.46	.QV	.	.	.	.
2.850	0.3235	1.47	.QV	.	.	.	.
2.867	0.3255	1.47	.QV	.	.	.	.
2.883	0.3275	1.47	.QV	.	.	.	.
2.900	0.3296	1.47	.QV	.	.	.	.
2.917	0.3316	1.47	.QV	.	.	.	.
2.933	0.3336	1.47	.QV	.	.	.	.
2.950	0.3356	1.47	.QV	.	.	.	.
2.967	0.3377	1.47	.QV	.	.	.	.
2.983	0.3397	1.47	.QV	.	.	.	.
3.000	0.3417	1.47	.QV	.	.	.	.
3.017	0.3437	1.47	.QV	.	.	.	.
3.033	0.3458	1.47	.QV	.	.	.	.
3.050	0.3478	1.47	.QV	.	.	.	.
3.067	0.3498	1.48	.QV	.	.	.	.
3.083	0.3519	1.48	.QV	.	.	.	.
3.100	0.3539	1.48	.QV	.	.	.	.
3.117	0.3559	1.48	.QV	.	.	.	.
3.133	0.3580	1.48	.QV	.	.	.	.
3.150	0.3600	1.48	.QV	.	.	.	.
3.167	0.3621	1.48	.Q V	.	.	.	.
3.183	0.3641	1.48	.Q V	.	.	.	.
3.200	0.3661	1.48	.Q V	.	.	.	.
3.217	0.3682	1.48	.Q V	.	.	.	.
3.233	0.3702	1.48	.Q V	.	.	.	.
3.250	0.3723	1.48	.Q V	.	.	.	.
3.267	0.3743	1.48	.Q V	.	.	.	.
3.283	0.3764	1.49	.Q V	.	.	.	.
3.300	0.3784	1.49	.Q V	.	.	.	.
3.317	0.3804	1.49	.Q V	.	.	.	.
3.333	0.3825	1.49	.Q V	.	.	.	.
3.350	0.3846	1.49	.Q V	.	.	.	.
3.367	0.3866	1.49	.Q V	.	.	.	.
3.383	0.3887	1.49	.Q V	.	.	.	.
3.400	0.3907	1.49	.Q V	.	.	.	.
3.417	0.3928	1.49	.Q V	.	.	.	.
3.433	0.3948	1.49	.Q V	.	.	.	.
3.450	0.3969	1.49	.Q V	.	.	.	.
3.467	0.3990	1.50	.Q V	.	.	.	.
3.483	0.4010	1.50	.Q V	.	.	.	.
3.500	0.4031	1.50	.Q V	.	.	.	.
3.517	0.4051	1.50	.Q V	.	.	.	.
3.533	0.4072	1.50	.Q V	.	.	.	.
3.550	0.4093	1.50	.Q V	.	.	.	.
3.567	0.4113	1.50	.Q V	.	.	.	.
3.583	0.4134	1.50	.Q V	.	.	.	.
3.600	0.4155	1.50	.Q V	.	.	.	.
3.617	0.4175	1.50	.Q V	.	.	.	.
3.633	0.4196	1.51	.Q V	.	.	.	.
3.650	0.4217	1.51	.Q V	.	.	.	.
3.667	0.4238	1.51	.Q V	.	.	.	.
3.683	0.4258	1.51	.Q V	.	.	.	.
3.700	0.4279	1.51	.Q V	.	.	.	.
3.717	0.4300	1.51	.Q V	.	.	.	.
3.733	0.4321	1.51	.Q V	.	.	.	.
3.750	0.4342	1.51	.Q V	.	.	.	.
3.767	0.4362	1.51	.Q V	.	.	.	.
3.783	0.4383	1.51	.Q V	.	.	.	.
3.800	0.4404	1.51	.Q V	.	.	.	.
3.817	0.4425	1.51	.Q V	.	.	.	.
3.833	0.4446	1.52	.Q V	.	.	.	.
3.850	0.4467	1.52	.Q V	.	.	.	.
3.867	0.4488	1.52	.Q V	.	.	.	.
3.883	0.4508	1.52	.Q V	.	.	.	.
3.900	0.4529	1.52	.Q V	.	.	.	.
3.917	0.4550	1.52	.Q V	.	.	.	.
3.933	0.4571	1.52	.Q V	.	.	.	.
3.950	0.4592	1.52	.Q V	.	.	.	.
3.967	0.4613	1.52	.Q V	.	.	.	.
3.983	0.4634	1.52	.Q V	.	.	.	.
4.000	0.4655	1.52	.Q V	.	.	.	.
4.017	0.4676	1.52	.Q V	.	.	.	.

4.033	0.4697	1.53	.Q V	.	.	.	.
4.050	0.4718	1.53	.Q V	.	.	.	.
4.067	0.4739	1.53	.Q V	.	.	.	.
4.083	0.4760	1.53	.Q V	.	.	.	.
4.100	0.4781	1.53	.Q V	.	.	.	.
4.117	0.4802	1.53	.Q V	.	.	.	.
4.133	0.4824	1.53	.Q V	.	.	.	.
4.150	0.4845	1.53	.Q V	.	.	.	.
4.167	0.4866	1.53	.Q V	.	.	.	.
4.183	0.4887	1.53	.Q V	.	.	.	.
4.200	0.4908	1.53	.Q V	.	.	.	.
4.217	0.4929	1.54	.Q V	.	.	.	.
4.233	0.4950	1.54	.Q V	.	.	.	.
4.250	0.4972	1.54	.Q V	.	.	.	.
4.267	0.4993	1.54	.Q V	.	.	.	.
4.283	0.5014	1.54	.Q V	.	.	.	.
4.300	0.5035	1.54	.Q V	.	.	.	.
4.317	0.5056	1.54	.Q V	.	.	.	.
4.333	0.5078	1.54	.Q V	.	.	.	.
4.350	0.5099	1.54	.Q V	.	.	.	.
4.367	0.5120	1.55	.Q V	.	.	.	.
4.383	0.5141	1.55	.Q V	.	.	.	.
4.400	0.5163	1.55	.Q V	.	.	.	.
4.417	0.5184	1.55	.Q V	.	.	.	.
4.433	0.5205	1.55	.Q V	.	.	.	.
4.450	0.5227	1.55	.Q V	.	.	.	.
4.467	0.5248	1.55	.Q V	.	.	.	.
4.483	0.5269	1.55	.Q V	.	.	.	.
4.500	0.5291	1.55	.Q V	.	.	.	.
4.517	0.5312	1.55	.Q V	.	.	.	.
4.533	0.5334	1.55	.Q V	.	.	.	.
4.550	0.5355	1.55	.Q V	.	.	.	.
4.567	0.5376	1.56	.Q V	.	.	.	.
4.583	0.5398	1.56	.Q V	.	.	.	.
4.600	0.5419	1.56	.Q V	.	.	.	.
4.617	0.5441	1.56	.Q V	.	.	.	.
4.633	0.5462	1.56	.Q V	.	.	.	.
4.650	0.5484	1.56	.Q V	.	.	.	.
4.667	0.5505	1.56	.Q V	.	.	.	.
4.683	0.5527	1.56	.Q V	.	.	.	.
4.700	0.5548	1.56	.Q V	.	.	.	.
4.717	0.5570	1.56	.Q V	.	.	.	.
4.733	0.5592	1.57	.Q V	.	.	.	.
4.750	0.5613	1.57	.Q V	.	.	.	.
4.767	0.5635	1.57	.Q V	.	.	.	.
4.783	0.5656	1.57	.Q V	.	.	.	.
4.800	0.5678	1.57	.Q V	.	.	.	.
4.817	0.5700	1.57	.Q V	.	.	.	.
4.833	0.5721	1.57	.Q V	.	.	.	.
4.850	0.5743	1.57	.Q V	.	.	.	.
4.867	0.5765	1.58	.Q V	.	.	.	.
4.883	0.5786	1.58	.Q V	.	.	.	.
4.900	0.5808	1.58	.Q V	.	.	.	.
4.917	0.5830	1.58	.Q V	.	.	.	.
4.933	0.5852	1.58	.Q V	.	.	.	.
4.950	0.5873	1.58	.Q V	.	.	.	.
4.967	0.5895	1.58	.Q V	.	.	.	.
4.983	0.5917	1.58	.Q V	.	.	.	.
5.000	0.5939	1.58	.Q V	.	.	.	.
5.017	0.5960	1.58	.Q V	.	.	.	.
5.033	0.5982	1.58	.Q V	.	.	.	.
5.050	0.6004	1.58	.Q V	.	.	.	.
5.067	0.6026	1.59	.Q V	.	.	.	.
5.083	0.6048	1.59	.Q V	.	.	.	.
5.100	0.6070	1.59	.Q V	.	.	.	.
5.117	0.6092	1.59	.Q V	.	.	.	.
5.133	0.6113	1.59	.Q V	.	.	.	.
5.150	0.6135	1.59	.Q V	.	.	.	.
5.167	0.6157	1.59	.Q V	.	.	.	.
5.183	0.6179	1.59	.Q V	.	.	.	.
5.200	0.6201	1.59	.Q V	.	.	.	.
5.217	0.6223	1.60	.Q V	.	.	.	.
5.233	0.6245	1.60	.Q V	.	.	.	.
5.250	0.6267	1.60	.Q V	.	.	.	.
5.267	0.6289	1.60	.Q V	.	.	.	.
5.283	0.6311	1.60	.Q V	.	.	.	.
5.300	0.6333	1.60	.Q V	.	.	.	.
5.317	0.6355	1.60	.Q V	.	.	.	.
5.333	0.6377	1.60	.Q V	.	.	.	.

5.350	0.6400	1.61	.Q	V	.	.	.	.
5.367	0.6422	1.61	.Q	V	.	.	.	.
5.383	0.6444	1.61	.Q	V	.	.	.	.
5.400	0.6466	1.61	.Q	V	.	.	.	.
5.417	0.6488	1.61	.Q	V	.	.	.	.
5.433	0.6510	1.61	.Q	V	.	.	.	.
5.450	0.6533	1.61	.Q	V	.	.	.	.
5.467	0.6555	1.61	.Q	V	.	.	.	.
5.483	0.6577	1.61	.Q	V	.	.	.	.
5.500	0.6599	1.61	.Q	V	.	.	.	.
5.517	0.6621	1.61	.Q	V	.	.	.	.
5.533	0.6644	1.62	.Q	V	.	.	.	.
5.550	0.6666	1.62	.Q	V	.	.	.	.
5.567	0.6688	1.62	.Q	V	.	.	.	.
5.583	0.6711	1.62	.Q	V	.	.	.	.
5.600	0.6733	1.62	.Q	V	.	.	.	.
5.617	0.6755	1.62	.Q	V	.	.	.	.
5.633	0.6778	1.62	.Q	V	.	.	.	.
5.650	0.6800	1.63	.Q	V	.	.	.	.
5.667	0.6822	1.63	.Q	V	.	.	.	.
5.683	0.6845	1.63	.Q	V	.	.	.	.
5.700	0.6867	1.63	.Q	V	.	.	.	.
5.717	0.6890	1.63	.Q	V	.	.	.	.
5.733	0.6912	1.63	.Q	V	.	.	.	.
5.750	0.6935	1.63	.Q	V	.	.	.	.
5.767	0.6957	1.63	.Q	V	.	.	.	.
5.783	0.6980	1.63	.Q	V	.	.	.	.
5.800	0.7002	1.63	.Q	V	.	.	.	.
5.817	0.7025	1.64	.Q	V	.	.	.	.
5.833	0.7047	1.64	.Q	V	.	.	.	.
5.850	0.7070	1.64	.Q	V	.	.	.	.
5.867	0.7092	1.64	.Q	V	.	.	.	.
5.883	0.7115	1.64	.Q	V	.	.	.	.
5.900	0.7138	1.64	.Q	V	.	.	.	.
5.917	0.7160	1.64	.Q	V	.	.	.	.
5.933	0.7183	1.64	.Q	V	.	.	.	.
5.950	0.7205	1.64	.Q	V	.	.	.	.
5.967	0.7228	1.65	.Q	V	.	.	.	.
5.983	0.7251	1.65	.Q	V	.	.	.	.
6.000	0.7273	1.65	.Q	V	.	.	.	.
6.017	0.7296	1.65	.Q	V	.	.	.	.
6.033	0.7319	1.65	.Q	V	.	.	.	.
6.050	0.7342	1.65	.Q	V	.	.	.	.
6.067	0.7364	1.65	.Q	V	.	.	.	.
6.083	0.7387	1.65	.Q	V	.	.	.	.
6.100	0.7410	1.66	.Q	V	.	.	.	.
6.117	0.7433	1.66	.Q	V	.	.	.	.
6.133	0.7456	1.66	.Q	V	.	.	.	.
6.150	0.7479	1.66	.Q	V	.	.	.	.
6.167	0.7502	1.66	.Q	V	.	.	.	.
6.183	0.7524	1.66	.Q	V	.	.	.	.
6.200	0.7547	1.66	.Q	V	.	.	.	.
6.217	0.7570	1.66	.Q	V	.	.	.	.
6.233	0.7593	1.66	.Q	V	.	.	.	.
6.250	0.7616	1.67	.Q	V	.	.	.	.
6.267	0.7639	1.67	.Q	V	.	.	.	.
6.283	0.7662	1.67	.Q	V	.	.	.	.
6.300	0.7685	1.67	.Q	V	.	.	.	.
6.317	0.7708	1.67	.Q	V	.	.	.	.
6.333	0.7731	1.67	.Q	V	.	.	.	.
6.350	0.7754	1.67	.Q	V	.	.	.	.
6.367	0.7777	1.68	.Q	V	.	.	.	.
6.383	0.7800	1.68	.Q	V	.	.	.	.
6.400	0.7823	1.68	.Q	V	.	.	.	.
6.417	0.7847	1.68	.Q	V	.	.	.	.
6.433	0.7870	1.68	.Q	V	.	.	.	.
6.450	0.7893	1.68	.Q	V	.	.	.	.
6.467	0.7916	1.68	.Q	V	.	.	.	.
6.483	0.7939	1.68	.Q	V	.	.	.	.
6.500	0.7962	1.68	.Q	V	.	.	.	.
6.517	0.7986	1.69	.Q	V	.	.	.	.
6.533	0.8009	1.69	.Q	V	.	.	.	.
6.550	0.8032	1.69	.Q	V	.	.	.	.
6.567	0.8055	1.69	.Q	V	.	.	.	.
6.583	0.8079	1.69	.Q	V	.	.	.	.
6.600	0.8102	1.69	.Q	V	.	.	.	.
6.617	0.8125	1.70	.Q	V	.	.	.	.
6.633	0.8149	1.70	.Q	V	.	.	.	.
6.650	0.8172	1.70	.Q	V	.	.	.	.

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6.667      0.8196      1.70  .Q    V   .         .         .         .
6.683      0.8219      1.70  .Q    V   .         .         .         .
6.700      0.8242      1.70  .Q    V   .         .         .         .
6.717      0.8266      1.70  .Q    V   .         .         .         .
6.733      0.8289      1.70  .Q    V   .         .         .         .
6.750      0.8313      1.70  .Q    V   .         .         .         .
6.767      0.8336      1.70  .Q    V   .         .         .         .
6.783      0.8360      1.71  .Q    V   .         .         .         .
6.800      0.8383      1.71  .Q    V   .         .         .         .
6.817      0.8407      1.71  .Q    V   .         .         .         .
6.833      0.8431      1.71  .Q     V  .         .         .         .
6.850      0.8454      1.71  .Q     V  .         .         .         .
6.867      0.8478      1.72  .Q     V  .         .         .         .
6.883      0.8501      1.72  .Q     V  .         .         .         .
6.900      0.8525      1.72  .Q     V  .         .         .         .
6.917      0.8549      1.72  .Q     V  .         .         .         .
6.933      0.8572      1.72  .Q     V  .         .         .         .
6.950      0.8596      1.72  .Q     V  .         .         .         .
6.967      0.8620      1.72  .Q     V  .         .         .         .
6.983      0.8644      1.72  .Q     V  .         .         .         .
7.000      0.8667      1.72  .Q     V  .         .         .         .
7.017      0.8691      1.73  .Q     V  .         .         .         .
7.033      0.8715      1.73  .Q     V  .         .         .         .
7.050      0.8739      1.73  .Q     V  .         .         .         .
7.067      0.8763      1.73  .Q     V  .         .         .         .
7.083      0.8786      1.73  .Q     V  .         .         .         .
7.100      0.8810      1.73  .Q     V  .         .         .         .
7.117      0.8834      1.74  .Q     V  .         .         .         .
7.133      0.8858      1.74  .Q     V  .         .         .         .
7.150      0.8882      1.74  .Q     V  .         .         .         .
7.167      0.8906      1.74  .Q     V  .         .         .         .
7.183      0.8930      1.74  .Q     V  .         .         .         .
7.200      0.8954      1.74  .Q     V  .         .         .         .
7.217      0.8978      1.74  .Q     V  .         .         .         .
7.233      0.9002      1.74  .Q     V  .         .         .         .
7.250      0.9026      1.74  .Q     V  .         .         .         .
7.267      0.9050      1.75  .Q     V  .         .         .         .
7.283      0.9074      1.75  .Q     V  .         .         .         .
7.300      0.9098      1.75  .Q     V  .         .         .         .
7.317      0.9122      1.75  .Q     V  .         .         .         .
7.333      0.9147      1.75  .Q     V  .         .         .         .
7.350      0.9171      1.76  .Q     V  .         .         .         .
7.367      0.9195      1.76  .Q     V  .         .         .         .
7.383      0.9219      1.76  .Q     V  .         .         .         .
7.400      0.9243      1.76  .Q     V  .         .         .         .
7.417      0.9268      1.76  .Q     V  .         .         .         .
7.433      0.9292      1.76  .Q     V  .         .         .         .
7.450      0.9316      1.76  .Q     V  .         .         .         .
7.467      0.9341      1.76  .Q     V  .         .         .         .
7.483      0.9365      1.77  .Q     V  .         .         .         .
7.500      0.9389      1.77  .Q     V  .         .         .         .
7.517      0.9414      1.77  .Q     V  .         .         .         .
7.533      0.9438      1.77  .Q     V  .         .         .         .
7.550      0.9462      1.77  .Q     V  .         .         .         .
7.567      0.9487      1.77  .Q     V  .         .         .         .
7.583      0.9511      1.78  .Q     V  .         .         .         .
7.600      0.9536      1.78  .Q     V  .         .         .         .
7.617      0.9560      1.78  .Q     V  .         .         .         .
7.633      0.9585      1.78  .Q     V  .         .         .         .
7.650      0.9609      1.78  .Q     V  .         .         .         .
7.667      0.9634      1.78  .Q      V .         .         .         .
7.683      0.9659      1.79  .Q      V .         .         .         .
7.700      0.9683      1.79  .Q      V .         .         .         .
7.717      0.9708      1.79  .Q      V .         .         .         .
7.733      0.9732      1.79  .Q      V .         .         .         .
7.750      0.9757      1.79  .Q      V .         .         .         .
7.767      0.9782      1.79  .Q      V .         .         .         .
7.783      0.9806      1.79  .Q      V .         .         .         .
7.800      0.9831      1.79  .Q      V .         .         .         .
7.817      0.9856      1.80  .Q      V .         .         .         .
7.833      0.9881      1.80  .Q      V .         .         .         .
7.850      0.9905      1.80  .Q      V .         .         .         .
7.867      0.9930      1.80  .Q      V .         .         .         .
7.883      0.9955      1.81  .Q      V .         .         .         .
7.900      0.9980      1.81  .Q      V .         .         .         .
7.917      1.0005      1.81  .Q      V .         .         .         .
7.933      1.0030      1.81  .Q      V .         .         .         .
7.950      1.0055      1.81  .Q      V .         .         .         .
7.967      1.0080      1.81  .Q      V .         .         .         .
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7.983     1.0105     1.81  .Q     V .        .        .        .
8.000     1.0130     1.81  .Q     V .        .        .        .
8.017     1.0155     1.81  .Q     V .        .        .        .
8.033     1.0180     1.82  .Q     V .        .        .        .
8.050     1.0205     1.82  .Q     V .        .        .        .
8.067     1.0230     1.82  .Q     V .        .        .        .
8.083     1.0255     1.82  .Q     V .        .        .        .
8.100     1.0280     1.83  .Q     V .        .        .        .
8.117     1.0305     1.83  .Q     V .        .        .        .
8.133     1.0330     1.83  .Q     V .        .        .        .
8.150     1.0356     1.83  .Q     V .        .        .        .
8.167     1.0381     1.83  .Q     V .        .        .        .
8.183     1.0406     1.83  .Q     V .        .        .        .
8.200     1.0431     1.83  .Q     V .        .        .        .
8.217     1.0457     1.84  .Q     V .        .        .        .
8.233     1.0482     1.84  .Q     V .        .        .        .
8.250     1.0507     1.84  .Q     V .        .        .        .
8.267     1.0533     1.84  .Q     V .        .        .        .
8.283     1.0558     1.84  .Q     V .        .        .        .
8.300     1.0583     1.84  .Q     V .        .        .        .
8.317     1.0609     1.85  .Q     V .        .        .        .
8.333     1.0634     1.85  .Q     V .        .        .        .
8.350     1.0660     1.85  .Q     V .        .        .        .
8.367     1.0685     1.85  .Q     V .        .        .        .
8.383     1.0711     1.86  .Q     V .        .        .        .
8.400     1.0736     1.86  .Q     V .        .        .        .
8.417     1.0762     1.86  .Q     V .        .        .        .
8.433     1.0788     1.86  .Q     V .        .        .        .
8.450     1.0813     1.86  .Q     V .        .        .        .
8.467     1.0839     1.86  .Q      V.        .        .        .
8.483     1.0865     1.86  .Q      V.        .        .        .
8.500     1.0890     1.86  .Q      V.        .        .        .
8.517     1.0916     1.87  .Q      V.        .        .        .
8.533     1.0942     1.87  .Q      V.        .        .        .
8.550     1.0967     1.87  .Q      V.        .        .        .
8.567     1.0993     1.87  .Q      V.        .        .        .
8.583     1.1019     1.88  .Q      V.        .        .        .
8.600     1.1045     1.88  .Q      V.        .        .        .
8.617     1.1071     1.88  .Q      V.        .        .        .
8.633     1.1097     1.88  .Q      V.        .        .        .
8.650     1.1123     1.88  .Q      V.        .        .        .
8.667     1.1149     1.88  .Q      V.        .        .        .
8.683     1.1175     1.89  .Q      V.        .        .        .
8.700     1.1201     1.89  .Q      V.        .        .        .
8.717     1.1227     1.89  .Q      V.        .        .        .
8.733     1.1253     1.89  .Q      V.        .        .        .
8.750     1.1279     1.89  .Q      V.        .        .        .
8.767     1.1305     1.89  .Q      V.        .        .        .
8.783     1.1331     1.90  . Q     V.        .        .        .
8.800     1.1357     1.90  . Q     V.        .        .        .
8.817     1.1383     1.90  . Q     V.        .        .        .
8.833     1.1409     1.90  . Q     V.        .        .        .
8.850     1.1436     1.91  . Q     V.        .        .        .
8.867     1.1462     1.91  . Q     V.        .        .        .
8.883     1.1488     1.91  . Q     V.        .        .        .
8.900     1.1515     1.91  . Q     V.        .        .        .
8.917     1.1541     1.91  . Q     V.        .        .        .
8.933     1.1567     1.91  . Q     V.        .        .        .
8.950     1.1594     1.92  . Q     V.        .        .        .
8.967     1.1620     1.92  . Q     V.        .        .        .
8.983     1.1647     1.92  . Q     V.        .        .        .
9.000     1.1673     1.92  . Q     V.        .        .        .
9.017     1.1699     1.92  . Q     V.        .        .        .
9.033     1.1726     1.92  . Q     V.        .        .        .
9.050     1.1753     1.93  . Q     V.        .        .        .
9.067     1.1779     1.93  . Q     V.        .        .        .
9.083     1.1806     1.93  . Q     V.        .        .        .
9.100     1.1832     1.93  . Q     V.        .        .        .
9.117     1.1859     1.94  . Q     V.        .        .        .
9.133     1.1886     1.94  . Q     V.        .        .        .
9.150     1.1913     1.94  . Q     V.        .        .        .
9.167     1.1939     1.94  . Q     V.        .        .        .
9.183     1.1966     1.94  . Q     V.        .        .        .
9.200     1.1993     1.95  . Q     V.        .        .        .
9.217     1.2020     1.95  . Q     V.        .        .        .
9.233     1.2047     1.95  . Q      V        .        .        .
9.250     1.2073     1.95  . Q      V        .        .        .
9.267     1.2100     1.95  . Q      V        .        .        .
9.283     1.2127     1.95  . Q      V        .        .        .
```

9.300	1.2154	1.96	.	Q	V	.	.	.
9.317	1.2181	1.96	.	Q	V	.	.	.
9.333	1.2208	1.96	.	Q	V	.	.	.
9.350	1.2235	1.97	.	Q	V	.	.	.
9.367	1.2262	1.97	.	Q	V	.	.	.
9.383	1.2290	1.97	.	Q	V	.	.	.
9.400	1.2317	1.97	.	Q	V	.	.	.
9.417	1.2344	1.97	.	Q	V	.	.	.
9.433	1.2371	1.98	.	Q	V	.	.	.
9.450	1.2398	1.98	.	Q	V	.	.	.
9.467	1.2426	1.98	.	Q	V	.	.	.
9.483	1.2453	1.98	.	Q	V	.	.	.
9.500	1.2480	1.98	.	Q	V	.	.	.
9.517	1.2507	1.98	.	Q	V	.	.	.
9.533	1.2535	1.99	.	Q	V	.	.	.
9.550	1.2562	1.99	.	Q	V	.	.	.
9.567	1.2590	1.99	.	Q	V	.	.	.
9.583	1.2617	2.00	.	Q	V	.	.	.
9.600	1.2645	2.00	.	Q	V	.	.	.
9.617	1.2672	2.00	.	Q	V	.	.	.
9.633	1.2700	2.00	.	Q	V	.	.	.
9.650	1.2728	2.01	.	Q	V	.	.	.
9.667	1.2755	2.01	.	Q	V	.	.	.
9.683	1.2783	2.01	.	Q	V	.	.	.
9.700	1.2811	2.01	.	Q	V	.	.	.
9.717	1.2838	2.01	.	Q	V	.	.	.
9.733	1.2866	2.01	.	Q	V	.	.	.
9.750	1.2894	2.01	.	Q	V	.	.	.
9.767	1.2921	2.02	.	Q	V	.	.	.
9.783	1.2949	2.02	.	Q	V	.	.	.
9.800	1.2977	2.02	.	Q	V	.	.	.
9.817	1.3005	2.03	.	Q	V	.	.	.
9.833	1.3033	2.03	.	Q	V	.	.	.
9.850	1.3061	2.03	.	Q	V	.	.	.
9.867	1.3089	2.04	.	Q	V	.	.	.
9.883	1.3117	2.04	.	Q	V	.	.	.
9.900	1.3145	2.04	.	Q	V	.	.	.
9.917	1.3173	2.04	.	Q	V	.	.	.
9.933	1.3202	2.04	.	Q	V	.	.	.
9.950	1.3230	2.05	.	Q	V	.	.	.
9.967	1.3258	2.05	.	Q	.V	.	.	.
9.983	1.3286	2.05	.	Q	.V	.	.	.
10.000	1.3314	2.05	.	Q	.V	.	.	.
10.017	1.3343	2.05	.	Q	.V	.	.	.
10.033	1.3371	2.06	.	Q	.V	.	.	.
10.050	1.3399	2.06	.	Q	.V	.	.	.
10.067	1.3428	2.06	.	Q	.V	.	.	.
10.083	1.3456	2.07	.	Q	.V	.	.	.
10.100	1.3485	2.07	.	Q	.V	.	.	.
10.117	1.3513	2.07	.	Q	.V	.	.	.
10.133	1.3542	2.08	.	Q	.V	.	.	.
10.150	1.3570	2.08	.	Q	.V	.	.	.
10.167	1.3599	2.08	.	Q	.V	.	.	.
10.183	1.3628	2.08	.	Q	.V	.	.	.
10.200	1.3656	2.08	.	Q	.V	.	.	.
10.217	1.3685	2.08	.	Q	.V	.	.	.
10.233	1.3714	2.09	.	Q	.V	.	.	.
10.250	1.3743	2.09	.	Q	.V	.	.	.
10.267	1.3771	2.09	.	Q	.V	.	.	.
10.283	1.3800	2.09	.	Q	.V	.	.	.
10.300	1.3829	2.10	.	Q	.V	.	.	.
10.317	1.3858	2.10	.	Q	.V	.	.	.
10.333	1.3887	2.10	.	Q	.V	.	.	.
10.350	1.3916	2.11	.	Q	.V	.	.	.
10.367	1.3945	2.11	.	Q	.V	.	.	.
10.383	1.3974	2.11	.	Q	.V	.	.	.
10.400	1.4004	2.12	.	Q	.V	.	.	.
10.417	1.4033	2.12	.	Q	.V	.	.	.
10.433	1.4062	2.12	.	Q	.V	.	.	.
10.450	1.4091	2.12	.	Q	.V	.	.	.
10.467	1.4120	2.12	.	Q	.V	.	.	.
10.483	1.4150	2.13	.	Q	.V	.	.	.
10.500	1.4179	2.13	.	Q	.V	.	.	.
10.517	1.4208	2.13	.	Q	.V	.	.	.
10.533	1.4238	2.13	.	Q	.V	.	.	.
10.550	1.4267	2.14	.	Q	.V	.	.	.
10.567	1.4297	2.14	.	Q	.V	.	.	.
10.583	1.4326	2.15	.	Q	.V	.	.	.
10.600	1.4356	2.15	.	Q	.V	.	.	.

10.617	1.4386	2.15	.	Q	.V	.	.	.
10.633	1.4415	2.16	.	Q	.V	.	.	.
10.650	1.4445	2.16	.	Q	.V	.	.	.
10.667	1.4475	2.16	.	Q	. V	.	.	.
10.683	1.4504	2.16	.	Q	. V	.	.	.
10.700	1.4534	2.16	.	Q	. V	.	.	.
10.717	1.4564	2.17	.	Q	. V	.	.	.
10.733	1.4594	2.17	.	Q	. V	.	.	.
10.750	1.4624	2.17	.	Q	. V	.	.	.
10.767	1.4654	2.17	.	Q	. V	.	.	.
10.783	1.4684	2.18	.	Q	. V	.	.	.
10.800	1.4714	2.18	.	Q	. V	.	.	.
10.817	1.4744	2.19	.	Q	. V	.	.	.
10.833	1.4774	2.19	.	Q	. V	.	.	.
10.850	1.4804	2.19	.	Q	. V	.	.	.
10.867	1.4835	2.20	.	Q	. V	.	.	.
10.883	1.4865	2.20	.	Q	. V	.	.	.
10.900	1.4895	2.20	.	Q	. V	.	.	.
10.917	1.4926	2.21	.	Q	. V	.	.	.
10.933	1.4956	2.21	.	Q	. V	.	.	.
10.950	1.4986	2.21	.	Q	. V	.	.	.
10.967	1.5017	2.21	.	Q	. V	.	.	.
10.983	1.5047	2.21	.	Q	. V	.	.	.
11.000	1.5078	2.22	.	Q	. V	.	.	.
11.017	1.5108	2.22	.	Q	. V	.	.	.
11.033	1.5139	2.22	.	Q	. V	.	.	.
11.050	1.5170	2.23	.	Q	. V	.	.	.
11.067	1.5201	2.23	.	Q	. V	.	.	.
11.083	1.5231	2.24	.	Q	. V	.	.	.
11.100	1.5262	2.24	.	Q	. V	.	.	.
11.117	1.5293	2.24	.	Q	. V	.	.	.
11.133	1.5324	2.25	.	Q	. V	.	.	.
11.150	1.5355	2.25	.	Q	. V	.	.	.
11.167	1.5386	2.25	.	Q	. V	.	.	.
11.183	1.5417	2.26	.	Q	. V	.	.	.
11.200	1.5448	2.26	.	Q	. V	.	.	.
11.217	1.5479	2.26	.	Q	. V	.	.	.
11.233	1.5511	2.26	.	Q	. V	.	.	.
11.250	1.5542	2.26	.	Q	. V	.	.	.
11.267	1.5573	2.27	.	Q	. V	.	.	.
11.283	1.5604	2.27	.	Q	. V	.	.	.
11.300	1.5636	2.28	.	Q	. V	.	.	.
11.317	1.5667	2.28	.	Q	. V	.	.	.
11.333	1.5699	2.29	.	Q	. V	.	.	.
11.350	1.5730	2.29	.	Q	. V	.	.	.
11.367	1.5762	2.30	.	Q	. V	.	.	.
11.383	1.5793	2.30	.	Q	. V	.	.	.
11.400	1.5825	2.30	.	Q	. V	.	.	.
11.417	1.5857	2.30	.	Q	. V	.	.	.
11.433	1.5889	2.31	.	Q	. V	.	.	.
11.450	1.5920	2.31	.	Q	. V	.	.	.
11.467	1.5952	2.31	.	Q	. V	.	.	.
11.483	1.5984	2.31	.	Q	. V	.	.	.
11.500	1.6016	2.32	.	Q	. V	.	.	.
11.517	1.6048	2.32	.	Q	. V	.	.	.
11.533	1.6080	2.33	.	Q	. V	.	.	.
11.550	1.6112	2.33	.	Q	. V	.	.	.
11.567	1.6144	2.34	.	Q	. V	.	.	.
11.583	1.6177	2.34	.	Q	. V	.	.	.
11.600	1.6209	2.35	.	Q	. V	.	.	.
11.617	1.6241	2.35	.	Q	. V	.	.	.
11.633	1.6274	2.36	.	Q	. V	.	.	.
11.650	1.6306	2.36	.	Q	. V	.	.	.
11.667	1.6339	2.36	.	Q	. V	.	.	.
11.683	1.6371	2.36	.	Q	. V	.	.	.
11.700	1.6404	2.37	.	Q	. V	.	.	.
11.717	1.6436	2.37	.	Q	. V	.	.	.
11.733	1.6469	2.37	.	Q	. V	.	.	.
11.750	1.6502	2.37	.	Q	. V	.	.	.
11.767	1.6535	2.38	.	Q	. V	.	.	.
11.783	1.6567	2.38	.	Q	. V	.	.	.
11.800	1.6600	2.39	.	Q	. V	.	.	.
11.817	1.6633	2.39	.	Q	. V	.	.	.
11.833	1.6666	2.40	.	Q	. V	.	.	.
11.850	1.6699	2.40	.	Q	. V	.	.	.
11.867	1.6733	2.41	.	Q	. V	.	.	.
11.883	1.6766	2.42	.	Q	. V	.	.	.
11.900	1.6799	2.42	.	Q	. V	.	.	.
11.917	1.6833	2.42	.	Q	. V	.	.	.

11.933	1.6866	2.42	. Q	.	V	.	.	.
11.950	1.6899	2.43	. Q	.	V	.	.	.
11.967	1.6933	2.43	. Q	.	V	.	.	.
11.983	1.6966	2.43	. Q	.	V	.	.	.
12.000	1.7000	2.44	. Q	.	V	.	.	.
12.017	1.7034	2.45	. Q	.	V	.	.	.
12.033	1.7068	2.46	. Q	.	V	.	.	.
12.050	1.7102	2.48	. Q	.	V	.	.	.
12.067	1.7136	2.50	. Q	.	V	.	.	.
12.083	1.7171	2.52	. Q	.	V	.	.	.
12.100	1.7206	2.53	. Q	.	V	.	.	.
12.117	1.7241	2.55	. Q	.	V	.	.	.
12.133	1.7276	2.57	. Q	.	V	.	.	.
12.150	1.7312	2.57	. Q	.	V	.	.	.
12.167	1.7347	2.58	. Q	.	V	.	.	.
12.183	1.7383	2.58	. Q	.	V	.	.	.
12.200	1.7418	2.58	. Q	.	V	.	.	.
12.217	1.7454	2.59	. Q	.	V	.	.	.
12.233	1.7490	2.59	. Q	.	V	.	.	.
12.250	1.7525	2.59	. Q	.	V	.	.	.
12.267	1.7561	2.60	. Q	.	V	.	.	.
12.283	1.7597	2.60	. Q	.	V	.	.	.
12.300	1.7633	2.61	. Q	.	V	.	.	.
12.317	1.7669	2.62	. Q	.	V	.	.	.
12.333	1.7705	2.62	. Q	.	V	.	.	.
12.350	1.7741	2.63	. Q	.	V	.	.	.
12.367	1.7777	2.63	. Q	.	V	.	.	.
12.383	1.7814	2.64	. Q	.	V	.	.	.
12.400	1.7850	2.64	. Q	.	V	.	.	.
12.417	1.7887	2.65	. Q	.	V	.	.	.
12.433	1.7923	2.65	. Q	.	V	.	.	.
12.450	1.7960	2.65	. Q	.	V	.	.	.
12.467	1.7996	2.66	. Q	.	V	.	.	.
12.483	1.8033	2.66	. Q	.	V	.	.	.
12.500	1.8070	2.66	. Q	.	V	.	.	.
12.517	1.8107	2.67	. Q	.	V	.	.	.
12.533	1.8143	2.68	. Q	.	V	.	.	.
12.550	1.8180	2.68	. Q	.	V	.	.	.
12.567	1.8217	2.69	. Q	.	V	.	.	.
12.583	1.8255	2.70	. Q	.	V	.	.	.
12.600	1.8292	2.70	. Q	.	V	.	.	.
12.617	1.8329	2.71	. Q	.	V	.	.	.
12.633	1.8367	2.72	. Q	.	V	.	.	.
12.650	1.8404	2.72	. Q	.	V	.	.	.
12.667	1.8442	2.73	. Q	.	V	.	.	.
12.683	1.8479	2.73	. Q	.	V	.	.	.
12.700	1.8517	2.73	. Q	.	V	.	.	.
12.717	1.8555	2.74	. Q	.	V	.	.	.
12.733	1.8592	2.74	. Q	.	V	.	.	.
12.750	1.8630	2.74	. Q	.	V	.	.	.
12.767	1.8668	2.75	. Q	.	V	.	.	.
12.783	1.8706	2.76	. Q	.	V	.	.	.
12.800	1.8744	2.77	. Q	.	V	.	.	.
12.817	1.8782	2.77	. Q	.	V	.	.	.
12.833	1.8821	2.78	. Q	.	V	.	.	.
12.850	1.8859	2.79	. Q	.	V	.	.	.
12.867	1.8898	2.80	. Q	.	V	.	.	.
12.883	1.8936	2.80	. Q	.	V	.	.	.
12.900	1.8975	2.81	. Q	.	V	.	.	.
12.917	1.9014	2.81	. Q	.	V	.	.	.
12.933	1.9053	2.82	. Q	.	V	.	.	.
12.950	1.9091	2.82	. Q	.	V	.	.	.
12.967	1.9130	2.83	. Q	.	V	.	.	.
12.983	1.9169	2.83	. Q	.	V	.	.	.
13.000	1.9208	2.83	. Q	.	V	.	.	.
13.017	1.9247	2.84	. Q	.	V	.	.	.
13.033	1.9287	2.85	. Q	.	V	.	.	.
13.050	1.9326	2.86	. Q	.	V	.	.	.
13.067	1.9366	2.87	. Q	.	V	.	.	.
13.083	1.9405	2.87	. Q	.	V	.	.	.
13.100	1.9445	2.88	. Q	.	V	.	.	.
13.117	1.9485	2.89	. Q	.	V	.	.	.
13.133	1.9525	2.90	. Q	.	V	.	.	.
13.150	1.9565	2.91	. Q	.	V	.	.	.
13.167	1.9605	2.91	. Q	.	V	.	.	.
13.183	1.9645	2.91	. Q	.	V	.	.	.
13.200	1.9685	2.92	. Q	.	V	.	.	.
13.217	1.9725	2.92	. Q	.	V	.	.	.
13.233	1.9766	2.93	. Q	.	V	.	.	.

13.250	1.9806	2.93	.	Q	.	V	.	.	.
13.267	1.9847	2.94	.	Q	.	V	.	.	.
13.283	1.9887	2.95	.	Q	.	V	.	.	.
13.300	1.9928	2.96	.	Q	.	V	.	.	.
13.317	1.9969	2.97	.	Q	.	V	.	.	.
13.333	2.0010	2.98	.	Q	.	V	.	.	.
13.350	2.0051	2.99	.	Q	.	V	.	.	.
13.367	2.0092	3.00	.	Q	.	V	.	.	.
13.383	2.0134	3.01	.	Q	.	V	.	.	.
13.400	2.0175	3.01	.	Q	.	V	.	.	.
13.417	2.0217	3.02	.	Q	.	V	.	.	.
13.433	2.0259	3.02	.	Q	.	V	.	.	.
13.450	2.0300	3.03	.	Q	.	V	.	.	.
13.467	2.0342	3.04	.	Q	.	V	.	.	.
13.483	2.0384	3.04	.	Q	.	V	.	.	.
13.500	2.0426	3.05	.	Q	.	V	.	.	.
13.517	2.0468	3.05	.	Q	.	V	.	.	.
13.533	2.0510	3.07	.	Q	.	V	.	.	.
13.550	2.0553	3.08	.	Q	.	V	.	.	.
13.567	2.0595	3.09	.	Q	.	V	.	.	.
13.583	2.0638	3.10	.	Q	.	V	.	.	.
13.600	2.0681	3.11	.	Q	.	V	.	.	.
13.617	2.0724	3.12	.	Q	.	V	.	.	.
13.633	2.0767	3.13	.	Q	.	V	.	.	.
13.650	2.0810	3.14	.	Q	.	V	.	.	.
13.667	2.0853	3.14	.	Q	.	V	.	.	.
13.683	2.0897	3.15	.	Q	.	V	.	.	.
13.700	2.0940	3.16	.	Q	.	V	.	.	.
13.717	2.0984	3.16	.	Q	.	V	.	.	.
13.733	2.1028	3.17	.	Q	.	V	.	.	.
13.750	2.1071	3.17	.	Q	.	V	.	.	.
13.767	2.1115	3.18	.	Q	.	V	.	.	.
13.783	2.1159	3.20	.	Q	.	V	.	.	.
13.800	2.1203	3.21	.	Q	.	V	.	.	.
13.817	2.1248	3.22	.	Q	.	V	.	.	.
13.833	2.1292	3.24	.	Q	.	V	.	.	.
13.850	2.1337	3.25	.	Q	.	V	.	.	.
13.867	2.1382	3.26	.	Q	.	V	.	.	.
13.883	2.1427	3.27	.	Q	.	V	.	.	.
13.900	2.1472	3.28	.	Q	.	V	.	.	.
13.917	2.1518	3.29	.	Q	.	V	.	.	.
13.933	2.1563	3.30	.	Q	.	V	.	.	.
13.950	2.1609	3.30	.	Q	.	V	.	.	.
13.967	2.1654	3.31	.	Q	.	V	.	.	.
13.983	2.1700	3.32	.	Q	.	V	.	.	.
14.000	2.1746	3.32	.	Q	.	V	.	.	.
14.017	2.1791	3.31	.	Q	.	V	.	.	.
14.033	2.1837	3.28	.	Q	.	V	.	.	.
14.050	2.1881	3.26	.	Q	.	V	.	.	.
14.067	2.1926	3.23	.	Q	.	V	.	.	.
14.083	2.1970	3.20	.	Q	.	V	.	.	.
14.100	2.2014	3.17	.	Q	.	V	.	.	.
14.117	2.2057	3.14	.	Q	.	V	.	.	.
14.133	2.2100	3.11	.	Q	.	V	.	.	.
14.150	2.2143	3.12	.	Q	.	V	.	.	.
14.167	2.2186	3.13	.	Q	.	V	.	.	.
14.183	2.2229	3.14	.	Q	.	V	.	.	.
14.200	2.2272	3.14	.	Q	.	V	.	.	.
14.217	2.2316	3.15	.	Q	.	V	.	.	.
14.233	2.2359	3.16	.	Q	.	V	.	.	.
14.250	2.2403	3.17	.	Q	.	V	.	.	.
14.267	2.2447	3.18	.	Q	.	V	.	.	.
14.283	2.2491	3.20	.	Q	.	V	.	.	.
14.300	2.2535	3.22	.	Q	.	V	.	.	.
14.317	2.2580	3.24	.	Q	.	V	.	.	.
14.333	2.2625	3.26	.	Q	.	V	.	.	.
14.350	2.2670	3.28	.	Q	.	V	.	.	.
14.367	2.2715	3.30	.	Q	.	V	.	.	.
14.383	2.2761	3.32	.	Q	.	V	.	.	.
14.400	2.2807	3.33	.	Q	.	V	.	.	.
14.417	2.2853	3.34	.	Q	.	V	.	.	.
14.433	2.2899	3.35	.	Q	.	V	.	.	.
14.450	2.2945	3.36	.	Q	.	V	.	.	.
14.467	2.2992	3.37	.	Q	.	V	.	.	.
14.483	2.3038	3.38	.	Q	.	V	.	.	.
14.500	2.3085	3.39	.	Q	.	V	.	.	.
14.517	2.3132	3.41	.	Q	.	V	.	.	.
14.533	2.3179	3.43	.	Q	.	V	.	.	.
14.550	2.3227	3.46	.	Q	.	V	.	.	.

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14.567      2.3275      3.48  .  Q      .        V.         .         .
14.583      2.3323      3.50  .  Q      .        V.         .         .
14.600      2.3372      3.53  .  Q      .        V.         .         .
14.617      2.3420      3.55  .  Q      .        V.         .         .
14.633      2.3470      3.57  .  Q      .        V.         .         .
14.650      2.3519      3.59  .  Q      .        V.         .         .
14.667      2.3569      3.60  .  Q      .        V.         .         .
14.683      2.3618      3.61  .  Q      .        V.         .         .
14.700      2.3668      3.63  .  Q      .        V.         .         .
14.717      2.3719      3.64  .  Q      .        V.         .         .
14.733      2.3769      3.66  .  Q      .        V.         .         .
14.750      2.3820      3.67  .  Q      .        V.         .         .
14.767      2.3870      3.69  .  Q      .        V.         .         .
14.783      2.3922      3.72  .  Q      .        V.         .         .
14.800      2.3973      3.75  .  Q      .        V.         .         .
14.817      2.4025      3.78  .  Q      .        V.         .         .
14.833      2.4078      3.81  .   Q     .        V.         .         .
14.850      2.4131      3.85  .   Q     .         V         .         .
14.867      2.4184      3.88  .   Q     .         V         .         .
14.883      2.4238      3.91  .   Q     .         V         .         .
14.900      2.4292      3.92  .   Q     .         V         .         .
14.917      2.4346      3.94  .   Q     .         V         .         .
14.933      2.4401      3.96  .   Q     .         V         .         .
14.950      2.4456      3.98  .   Q     .         V         .         .
14.967      2.4511      4.00  .   Q     .         V         .         .
14.983      2.4566      4.01  .   Q     .         V         .         .
15.000      2.4622      4.03  .   Q     .         V         .         .
15.017      2.4678      4.06  .   Q     .         V         .         .
15.033      2.4734      4.11  .   Q     .         V         .         .
15.050      2.4792      4.16  .   Q     .         V         .         .
15.067      2.4850      4.21  .   Q     .         V         .         .
15.083      2.4908      4.25  .   Q     .         V         .         .
15.100      2.4967      4.30  .   Q     .         V         .         .
15.117      2.5027      4.35  .   Q     .         V         .         .
15.133      2.5088      4.39  .   Q     .         V         .         .
15.150      2.5149      4.42  .   Q     .         V         .         .
15.167      2.5210      4.45  .   Q     .         V         .         .
15.183      2.5272      4.48  .   Q     .         V         .         .
15.200      2.5334      4.51  .   Q     .         .V        .         .
15.217      2.5396      4.54  .   Q     .         .V        .         .
15.233      2.5459      4.57  .   Q     .         .V        .         .
15.250      2.5523      4.60  .   Q     .         .V        .         .
15.267      2.5587      4.65  .   Q     .         .V        .         .
15.283      2.5652      4.72  .   Q     .         .V        .         .
15.300      2.5718      4.80  .    Q    .         .V        .         .
15.317      2.5785      4.87  .    Q    .         .V        .         .
15.333      2.5853      4.94  .    Q    .         .V        .         .
15.350      2.5922      5.02  .    Q    .         .V        .         .
15.367      2.5992      5.09  .    Q    .         .V        .         .
15.383      2.6063      5.14  .    Q    .         .V        .         .
15.400      2.6132      5.04  .    Q    .         .V        .         .
15.417      2.6200      4.92  .    Q    .         .V        .         .
15.433      2.6266      4.79  .    Q    .         .V        .         .
15.450      2.6330      4.67  .   Q     .         .V        .         .
15.467      2.6393      4.55  .   Q     .         .V        .         .
15.483      2.6454      4.43  .   Q     .         .V        .         .
15.500      2.6513      4.31  .   Q     .         . V       .         .
15.517      2.6573      4.31  .   Q     .         . V       .         .
15.533      2.6634      4.44  .   Q     .         . V       .         .
15.550      2.6697      4.57  .   Q     .         . V       .         .
15.567      2.6761      4.69  .   Q     .         . V       .         .
15.583      2.6828      4.82  .    Q    .         . V       .         .
15.600      2.6896      4.95  .    Q    .         . V       .         .
15.617      2.6966      5.08  .    Q    .         . V       .         .
15.633      2.7038      5.21  .    Q    .         . V       .         .
15.650      2.7111      5.31  .    Q    .         . V       .         .
15.667      2.7185      5.40  .    Q    .         . V       .         .
15.683      2.7261      5.50  .    Q    .         . V       .         .
15.700      2.7338      5.60  .    Q    .         . V       .         .
15.717      2.7417      5.69  .     Q   .         . V       .         .
15.733      2.7496      5.79  .     Q   .         . V       .         .
15.750      2.7577      5.89  .     Q   .         . V       .         .
15.767      2.7661      6.10  .     Q   .         . V       .         .
15.783      2.7750      6.44  .     Q   .         .  V      .         .
15.800      2.7843      6.77  .      Q  .         .  V      .         .
15.817      2.7941      7.10  .      Q  .         .  V      .         .
15.833      2.8044      7.44  .      Q  .         .  V      .         .
15.850      2.8151      7.77  .       Q .         .  V      .         .
15.867      2.8262      8.11  .       Q .         .  V      .         .
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15.883      2.8379      8.45  .       Q .         .  V      .         .
15.900      2.8501      8.89  .        Q.         .  V      .         .
15.917      2.8630      9.34  .        Q.         .  V      .         .
15.933      2.8765      9.79  .         Q         .  V      .         .
15.950      2.8906     10.24  .         Q         .   V     .         .
15.967      2.9053     10.69  .         .Q        .   V     .         .
15.983      2.9206     11.14  .         .Q        .   V     .         .
16.000      2.9366     11.58  .         . Q       .   V     .         .
16.017      2.9553     13.55  .         .   Q     .   V     .         .
16.033      2.9787     17.03  .         .      Q  .   V     .         .
16.050      3.0070     20.50  .         .         .Q  V     .         .
16.067      3.0400     23.98  .         .         .    Q    .         .
16.083      3.0778     27.46  .         .         .    V  Q .         .
16.100      3.1204     30.94  .         .         .    V    . Q       .
16.117      3.1678     34.41  .         .         .     V   .     Q   .
16.133      3.2200     37.89  .         .         .     V   .        Q
16.150      3.2665     33.74  .         .         .      V  .    Q    .
16.167      3.3072     29.59  .         .         .      V  .Q        .
16.183      3.3423     25.44  .         .         .     QV  .         .
16.200      3.3716     21.29  .         .         . Q    V  .         .
16.217      3.3952     17.15  .         .       Q .      V .         .
16.233      3.4131     13.00  .         .  Q      .      V .         .
16.250      3.4253      8.85  .        Q.         .      V .         .
16.267      3.4345      6.63  .      Q  .         .      V .         .
16.283      3.4432      6.35  .     Q   .         .      V .         .
16.300      3.4516      6.07  .     Q   .         .      V .         .
16.317      3.4595      5.79  .     Q   .         .      V .         .
16.333      3.4671      5.51  .    Q    .         .      V .         .
16.350      3.4743      5.23  .    Q    .         .      V .         .
16.367      3.4812      4.95  .    Q    .         .      V .         .
16.383      3.4876      4.71  .   Q     .         .      V .         .
16.400      3.4941      4.69  .   Q     .         .       V.         .
16.417      3.5006      4.72  .   Q     .         .       V.         .
16.433      3.5071      4.75  .    Q    .         .       V.         .
16.450      3.5137      4.77  .    Q    .         .       V.         .
16.467      3.5203      4.80  .    Q    .         .       V.         .
16.483      3.5270      4.83  .    Q    .         .       V.         .
16.500      3.5337      4.85  .    Q    .         .       V.         .
16.517      3.5403      4.82  .    Q    .         .       V.         .
16.533      3.5468      4.73  .   Q     .         .       V.         .
16.550      3.5532      4.64  .   Q     .         .       V.         .
16.567      3.5595      4.56  .   Q     .         .       V.         .
16.583      3.5656      4.47  .   Q     .         .       V.         .
16.600      3.5717      4.38  .   Q     .         .       V.         .
16.617      3.5776      4.29  .   Q     .         .       V.         .
16.633      3.5834      4.21  .   Q     .         .       V.         .
16.650      3.5891      4.15  .   Q     .         .       V.         .
16.667      3.5947      4.09  .   Q     .         .       V.         .
16.683      3.6003      4.04  .   Q     .         .       V.         .
16.700      3.6058      3.98  .   Q     .         .       V.         .
16.717      3.6112      3.92  .   Q     .         .       V.         .
16.733      3.6165      3.87  .   Q     .         .        V         .
16.750      3.6218      3.81  .   Q     .         .        V         .
16.767      3.6269      3.77  .  Q      .         .        V         .
16.783      3.6321      3.72  .  Q      .         .        V         .
16.800      3.6371      3.68  .  Q      .         .        V         .
16.817      3.6422      3.64  .  Q      .         .        V         .
16.833      3.6471      3.60  .  Q      .         .        V         .
16.850      3.6520      3.56  .  Q      .         .        V         .
16.867      3.6569      3.52  .  Q      .         .        V         .
16.883      3.6617      3.48  .  Q      .         .        V         .
16.900      3.6664      3.45  .  Q      .         .        V         .
16.917      3.6711      3.42  .  Q      .         .        V         .
16.933      3.6758      3.39  .  Q      .         .        V         .
16.950      3.6804      3.35  .  Q      .         .        V         .
16.967      3.6850      3.32  .  Q      .         .        V         .
16.983      3.6895      3.29  .  Q      .         .        V         .
17.000      3.6940      3.26  .  Q      .         .        V         .
17.017      3.6985      3.25  .  Q      .         .        V         .
17.033      3.7030      3.27  .  Q      .         .        V         .
17.050      3.7076      3.29  .  Q      .         .        V         .
17.067      3.7121      3.31  .  Q      .         .        V         .
17.083      3.7167      3.33  .  Q      .         .        V         .
17.100      3.7213      3.35  .  Q      .         .        V         .
17.117      3.7259      3.36  .  Q      .         .        V         .
17.133      3.7306      3.38  .  Q      .         .        V         .
17.150      3.7352      3.36  .  Q      .         .        .V        .
17.167      3.7398      3.34  .  Q      .         .        .V        .
17.183      3.7444      3.32  .  Q      .         .        .V        .
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17.200	3.7489	3.30	. Q	.	.	.V	.
17.217	3.7535	3.28	. Q	.	.	.V	.
17.233	3.7579	3.26	. Q	.	.	.V	.
17.250	3.7624	3.24	. Q	.	.	.V	.
17.267	3.7668	3.22	. Q	.	.	.V	.
17.283	3.7712	3.20	. Q	.	.	.V	.
17.300	3.7756	3.18	. Q	.	.	.V	.
17.317	3.7800	3.16	. Q	.	.	.V	.
17.333	3.7843	3.14	. Q	.	.	.V	.
17.350	3.7886	3.13	. Q	.	.	.V	.
17.367	3.7929	3.11	. Q	.	.	.V	.
17.383	3.7971	3.09	. Q	.	.	.V	.
17.400	3.8014	3.07	. Q	.	.	.V	.
17.417	3.8056	3.06	. Q	.	.	.V	.
17.433	3.8098	3.04	. Q	.	.	.V	.
17.450	3.8139	3.03	. Q	.	.	.V	.
17.467	3.8181	3.01	. Q	.	.	.V	.
17.483	3.8222	3.00	. Q	.	.	.V	.
17.500	3.8263	2.98	. Q	.	.	.V	.
17.517	3.8304	2.96	. Q	.	.	.V	.
17.533	3.8345	2.95	. Q	.	.	.V	.
17.550	3.8385	2.94	. Q	.	.	.V	.
17.567	3.8425	2.92	. Q	.	.	.V	.
17.583	3.8466	2.91	. Q	.	.	.V	.
17.600	3.8505	2.90	. Q	.	.	.V	.
17.617	3.8545	2.88	. Q	.	.	. V	.
17.633	3.8585	2.87	. Q	.	.	. V	.
17.650	3.8624	2.86	. Q	.	.	. V	.
17.667	3.8663	2.84	. Q	.	.	. V	.
17.683	3.8702	2.83	. Q	.	.	. V	.
17.700	3.8741	2.82	. Q	.	.	. V	.
17.717	3.8780	2.81	. Q	.	.	. V	.
17.733	3.8818	2.79	. Q	.	.	. V	.
17.750	3.8856	2.78	. Q	.	.	. V	.
17.767	3.8894	2.77	. Q	.	.	. V	.
17.783	3.8932	2.76	. Q	.	.	. V	.
17.800	3.8970	2.75	. Q	.	.	. V	.
17.817	3.9008	2.74	. Q	.	.	. V	.
17.833	3.9046	2.73	. Q	.	.	. V	.
17.850	3.9083	2.71	. Q	.	.	. V	.
17.867	3.9120	2.70	. Q	.	.	. V	.
17.883	3.9157	2.69	. Q	.	.	. V	.
17.900	3.9194	2.68	. Q	.	.	. V	.
17.917	3.9231	2.67	. Q	.	.	. V	.
17.933	3.9268	2.66	. Q	.	.	. V	.
17.950	3.9304	2.65	. Q	.	.	. V	.
17.967	3.9341	2.64	. Q	.	.	. V	.
17.983	3.9377	2.63	. Q	.	.	. V	.
18.000	3.9413	2.62	. Q	.	.	. V	.
18.017	3.9449	2.61	. Q	.	.	. V	.
18.033	3.9484	2.59	. Q	.	.	. V	.
18.050	3.9520	2.56	. Q	.	.	. V	.
18.067	3.9555	2.54	. Q	.	.	. V	.
18.083	3.9590	2.52	. Q	.	.	. V	.
18.100	3.9624	2.50	. Q	.	.	. V	.
18.117	3.9658	2.48	. Q	.	.	. V	.
18.133	3.9692	2.46	. Q	.	.	. V	.
18.150	3.9726	2.45	. Q	.	.	. V	.
18.167	3.9759	2.44	. Q	.	.	. V	.
18.183	3.9793	2.43	. Q	.	.	. V	.
18.200	3.9826	2.42	. Q	.	.	. V	.
18.217	3.9860	2.42	. Q	.	.	. V	.
18.233	3.9893	2.41	. Q	.	.	. V	.
18.250	3.9926	2.40	. Q	.	.	. V	.
18.267	3.9959	2.39	. Q	.	.	. V	.
18.283	3.9992	2.38	. Q	.	.	. V	.
18.300	4.0024	2.38	. Q	.	.	. V	.
18.317	4.0057	2.37	. Q	.	.	. V	.
18.333	4.0089	2.36	. Q	.	.	. V	.
18.350	4.0122	2.35	. Q	.	.	. V	.
18.367	4.0154	2.34	. Q	.	.	. V	.
18.383	4.0186	2.34	. Q	.	.	. V	.
18.400	4.0218	2.33	. Q	.	.	. V	.
18.417	4.0250	2.32	. Q	.	.	. V	.
18.433	4.0282	2.31	. Q	.	.	. V	.
18.450	4.0314	2.31	. Q	.	.	. V	.
18.467	4.0346	2.30	. Q	.	.	. V	.
18.483	4.0377	2.29	. Q	.	.	. V	.
18.500	4.0409	2.29	. Q	.	.	. V	.

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18.517      4.0440      2.28  . Q       .         .         .  V      .
18.533      4.0471      2.27  . Q       .         .         .  V      .
18.550      4.0503      2.27  . Q       .         .         .  V      .
18.567      4.0534      2.26  . Q       .         .         .  V      .
18.583      4.0565      2.25  . Q       .         .         .  V      .
18.600      4.0596      2.25  . Q       .         .         .  V      .
18.617      4.0627      2.24  . Q       .         .         .  V      .
18.633      4.0657      2.23  . Q       .         .         .  V      .
18.650      4.0688      2.23  . Q       .         .         .  V      .
18.667      4.0719      2.22  . Q       .         .         .  V      .
18.683      4.0749      2.21  . Q       .         .         .  V      .
18.700      4.0779      2.21  . Q       .         .         .  V      .
18.717      4.0810      2.20  . Q       .         .         .  V      .
18.733      4.0840      2.20  . Q       .         .         .  V      .
18.750      4.0870      2.19  . Q       .         .         .  V      .
18.767      4.0900      2.18  . Q       .         .         .  V      .
18.783      4.0930      2.18  . Q       .         .         .  V      .
18.800      4.0960      2.17  . Q       .         .         .   V     .
18.817      4.0990      2.17  . Q       .         .         .   V     .
18.833      4.1020      2.16  . Q       .         .         .   V     .
18.850      4.1049      2.15  . Q       .         .         .   V     .
18.867      4.1079      2.15  . Q       .         .         .   V     .
18.883      4.1109      2.14  . Q       .         .         .   V     .
18.900      4.1138      2.14  . Q       .         .         .   V     .
18.917      4.1167      2.13  . Q       .         .         .   V     .
18.933      4.1197      2.13  . Q       .         .         .   V     .
18.950      4.1226      2.12  . Q       .         .         .   V     .
18.967      4.1255      2.12  . Q       .         .         .   V     .
18.983      4.1284      2.11  . Q       .         .         .   V     .
19.000      4.1313      2.10  . Q       .         .         .   V     .
19.017      4.1342      2.10  . Q       .         .         .   V     .
19.033      4.1371      2.09  . Q       .         .         .   V     .
19.050      4.1400      2.09  . Q       .         .         .   V     .
19.067      4.1428      2.08  . Q       .         .         .   V     .
19.083      4.1457      2.08  . Q       .         .         .   V     .
19.100      4.1485      2.07  . Q       .         .         .   V     .
19.117      4.1514      2.07  . Q       .         .         .   V     .
19.133      4.1542      2.06  . Q       .         .         .   V     .
19.150      4.1571      2.06  . Q       .         .         .   V     .
19.167      4.1599      2.05  . Q       .         .         .   V     .
19.183      4.1627      2.05  . Q       .         .         .   V     .
19.200      4.1655      2.04  . Q       .         .         .   V     .
19.217      4.1683      2.04  . Q       .         .         .   V     .
19.233      4.1711      2.03  . Q       .         .         .   V     .
19.250      4.1739      2.03  . Q       .         .         .   V     .
19.267      4.1767      2.02  . Q       .         .         .   V     .
19.283      4.1795      2.02  . Q       .         .         .   V     .
19.300      4.1823      2.02  . Q       .         .         .   V     .
19.317      4.1851      2.01  . Q       .         .         .   V     .
19.333      4.1878      2.01  . Q       .         .         .   V     .
19.350      4.1906      2.00  . Q       .         .         .   V     .
19.367      4.1933      2.00  . Q       .         .         .   V     .
19.383      4.1961      1.99  . Q       .         .         .   V     .
19.400      4.1988      1.99  . Q       .         .         .   V     .
19.417      4.2016      1.98  . Q       .         .         .   V     .
19.433      4.2043      1.98  . Q       .         .         .   V     .
19.450      4.2070      1.98  . Q       .         .         .   V     .
19.467      4.2097      1.97  . Q       .         .         .   V     .
19.483      4.2124      1.97  . Q       .         .         .   V     .
19.500      4.2151      1.96  . Q       .         .         .    V    .
19.517      4.2178      1.96  . Q       .         .         .    V    .
19.533      4.2205      1.95  . Q       .         .         .    V    .
19.550      4.2232      1.95  . Q       .         .         .    V    .
19.567      4.2259      1.95  . Q       .         .         .    V    .
19.583      4.2286      1.94  . Q       .         .         .    V    .
19.600      4.2312      1.94  . Q       .         .         .    V    .
19.617      4.2339      1.93  . Q       .         .         .    V    .
19.633      4.2366      1.93  . Q       .         .         .    V    .
19.650      4.2392      1.93  . Q       .         .         .    V    .
19.667      4.2419      1.92  . Q       .         .         .    V    .
19.683      4.2445      1.92  . Q       .         .         .    V    .
19.700      4.2471      1.91  . Q       .         .         .    V    .
19.717      4.2498      1.91  . Q       .         .         .    V    .
19.733      4.2524      1.91  . Q       .         .         .    V    .
19.750      4.2550      1.90  . Q       .         .         .    V    .
19.767      4.2576      1.90  . Q       .         .         .    V    .
19.783      4.2602      1.90  . Q       .         .         .    V    .
19.800      4.2628      1.89  .Q        .         .         .    V    .
19.817      4.2654      1.89  .Q        .         .         .    V    .
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19.833      4.2680      1.88  .Q        .         .         .    V    .
19.850      4.2706      1.88  .Q        .         .         .    V    .
19.867      4.2732      1.88  .Q        .         .         .    V    .
19.883      4.2758      1.87  .Q        .         .         .    V    .
19.900      4.2784      1.87  .Q        .         .         .    V    .
19.917      4.2809      1.87  .Q        .         .         .    V    .
19.933      4.2835      1.86  .Q        .         .         .    V    .
19.950      4.2861      1.86  .Q        .         .         .    V    .
19.967      4.2886      1.86  .Q        .         .         .    V    .
19.983      4.2912      1.85  .Q        .         .         .    V    .
20.000      4.2937      1.85  .Q        .         .         .    V    .
20.017      4.2963      1.85  .Q        .         .         .    V    .
20.033      4.2988      1.84  .Q        .         .         .    V    .
20.050      4.3013      1.84  .Q        .         .         .    V    .
20.067      4.3039      1.84  .Q        .         .         .    V    .
20.083      4.3064      1.83  .Q        .         .         .    V    .
20.100      4.3089      1.83  .Q        .         .         .    V    .
20.117      4.3114      1.82  .Q        .         .         .    V    .
20.133      4.3139      1.82  .Q        .         .         .    V    .
20.150      4.3164      1.82  .Q        .         .         .    V    .
20.167      4.3189      1.82  .Q        .         .         .    V    .
20.183      4.3214      1.81  .Q        .         .         .    V    .
20.200      4.3239      1.81  .Q        .         .         .    V    .
20.217      4.3264      1.81  .Q        .         .         .    V    .
20.233      4.3289      1.80  .Q        .         .         .    V    .
20.250      4.3314      1.80  .Q        .         .         .    V    .
20.267      4.3338      1.80  .Q        .         .         .    V    .
20.283      4.3363      1.79  .Q        .         .         .     V   .
20.300      4.3388      1.79  .Q        .         .         .     V   .
20.317      4.3412      1.79  .Q        .         .         .     V   .
20.333      4.3437      1.78  .Q        .         .         .     V   .
20.350      4.3461      1.78  .Q        .         .         .     V   .
20.367      4.3486      1.78  .Q        .         .         .     V   .
20.383      4.3510      1.77  .Q        .         .         .     V   .
20.400      4.3535      1.77  .Q        .         .         .     V   .
20.417      4.3559      1.77  .Q        .         .         .     V   .
20.433      4.3583      1.77  .Q        .         .         .     V   .
20.450      4.3608      1.76  .Q        .         .         .     V   .
20.467      4.3632      1.76  .Q        .         .         .     V   .
20.483      4.3656      1.76  .Q        .         .         .     V   .
20.500      4.3680      1.75  .Q        .         .         .     V   .
20.517      4.3704      1.75  .Q        .         .         .     V   .
20.533      4.3729      1.75  .Q        .         .         .     V   .
20.550      4.3753      1.75  .Q        .         .         .     V   .
20.567      4.3777      1.74  .Q        .         .         .     V   .
20.583      4.3801      1.74  .Q        .         .         .     V   .
20.600      4.3824      1.74  .Q        .         .         .     V   .
20.617      4.3848      1.73  .Q        .         .         .     V   .
20.633      4.3872      1.73  .Q        .         .         .     V   .
20.650      4.3896      1.73  .Q        .         .         .     V   .
20.667      4.3920      1.73  .Q        .         .         .     V   .
20.683      4.3943      1.72  .Q        .         .         .     V   .
20.700      4.3967      1.72  .Q        .         .         .     V   .
20.717      4.3991      1.72  .Q        .         .         .     V   .
20.733      4.4014      1.71  .Q        .         .         .     V   .
20.750      4.4038      1.71  .Q        .         .         .     V   .
20.767      4.4062      1.71  .Q        .         .         .     V   .
20.783      4.4085      1.71  .Q        .         .         .     V   .
20.800      4.4109      1.70  .Q        .         .         .     V   .
20.817      4.4132      1.70  .Q        .         .         .     V   .
20.833      4.4155      1.70  .Q        .         .         .     V   .
20.850      4.4179      1.70  .Q        .         .         .     V   .
20.867      4.4202      1.69  .Q        .         .         .     V   .
20.883      4.4225      1.69  .Q        .         .         .     V   .
20.900      4.4249      1.69  .Q        .         .         .     V   .
20.917      4.4272      1.69  .Q        .         .         .     V   .
20.933      4.4295      1.68  .Q        .         .         .     V   .
20.950      4.4318      1.68  .Q        .         .         .     V   .
20.967      4.4341      1.68  .Q        .         .         .     V   .
20.983      4.4364      1.68  .Q        .         .         .     V   .
21.000      4.4387      1.67  .Q        .         .         .     V   .
21.017      4.4410      1.67  .Q        .         .         .     V   .
21.033      4.4433      1.67  .Q        .         .         .     V   .
21.050      4.4456      1.67  .Q        .         .         .     V   .
21.067      4.4479      1.66  .Q        .         .         .     V   .
21.083      4.4502      1.66  .Q        .         .         .     V   .
21.100      4.4525      1.66  .Q        .         .         .     V   .
21.117      4.4548      1.66  .Q        .         .         .     V   .
21.133      4.4571      1.65  .Q        .         .         .      V  .
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21.150	4.4593	1.65	.Q	.	.	.	V	.
21.167	4.4616	1.65	.Q	.	.	.	V	.
21.183	4.4639	1.65	.Q	.	.	.	V	.
21.200	4.4661	1.64	.Q	.	.	.	V	.
21.217	4.4684	1.64	.Q	.	.	.	V	.
21.233	4.4707	1.64	.Q	.	.	.	V	.
21.250	4.4729	1.64	.Q	.	.	.	V	.
21.267	4.4752	1.63	.Q	.	.	.	V	.
21.283	4.4774	1.63	.Q	.	.	.	V	.
21.300	4.4797	1.63	.Q	.	.	.	V	.
21.317	4.4819	1.63	.Q	.	.	.	V	.
21.333	4.4841	1.63	.Q	.	.	.	V	.
21.350	4.4864	1.62	.Q	.	.	.	V	.
21.367	4.4886	1.62	.Q	.	.	.	V	.
21.383	4.4908	1.62	.Q	.	.	.	V	.
21.400	4.4931	1.62	.Q	.	.	.	V	.
21.417	4.4953	1.61	.Q	.	.	.	V	.
21.433	4.4975	1.61	.Q	.	.	.	V	.
21.450	4.4997	1.61	.Q	.	.	.	V	.
21.467	4.5019	1.61	.Q	.	.	.	V	.
21.483	4.5042	1.61	.Q	.	.	.	V	.
21.500	4.5064	1.60	.Q	.	.	.	V	.
21.517	4.5086	1.60	.Q	.	.	.	V	.
21.533	4.5108	1.60	.Q	.	.	.	V	.
21.550	4.5130	1.60	.Q	.	.	.	V	.
21.567	4.5152	1.60	.Q	.	.	.	V	.
21.583	4.5174	1.59	.Q	.	.	.	V	.
21.600	4.5196	1.59	.Q	.	.	.	V	.
21.617	4.5217	1.59	.Q	.	.	.	V	.
21.633	4.5239	1.59	.Q	.	.	.	V	.
21.650	4.5261	1.58	.Q	.	.	.	V	.
21.667	4.5283	1.58	.Q	.	.	.	V	.
21.683	4.5305	1.58	.Q	.	.	.	V	.
21.700	4.5326	1.58	.Q	.	.	.	V	.
21.717	4.5348	1.58	.Q	.	.	.	V	.
21.733	4.5370	1.57	.Q	.	.	.	V	.
21.750	4.5392	1.57	.Q	.	.	.	V	.
21.767	4.5413	1.57	.Q	.	.	.	V	.
21.783	4.5435	1.57	.Q	.	.	.	V	.
21.800	4.5456	1.57	.Q	.	.	.	V	.
21.817	4.5478	1.56	.Q	.	.	.	V	.
21.833	4.5499	1.56	.Q	.	.	.	V	.
21.850	4.5521	1.56	.Q	.	.	.	V	.
21.867	4.5542	1.56	.Q	.	.	.	V	.
21.883	4.5564	1.56	.Q	.	.	.	V	.
21.900	4.5585	1.55	.Q	.	.	.	V	.
21.917	4.5607	1.55	.Q	.	.	.	V	.
21.933	4.5628	1.55	.Q	.	.	.	V	.
21.950	4.5649	1.55	.Q	.	.	.	V	.
21.967	4.5671	1.55	.Q	.	.	.	V	.
21.983	4.5692	1.54	.Q	.	.	.	V	.
22.000	4.5713	1.54	.Q	.	.	.	V	.
22.017	4.5734	1.54	.Q	.	.	.	V	.
22.033	4.5756	1.54	.Q	.	.	.	V	.
22.050	4.5777	1.54	.Q	.	.	.	V	.
22.067	4.5798	1.54	.Q	.	.	.	V	.
22.083	4.5819	1.53	.Q	.	.	.	V	.
22.100	4.5840	1.53	.Q	.	.	.	V	.
22.117	4.5861	1.53	.Q	.	.	.	V	.
22.133	4.5882	1.53	.Q	.	.	.	V	.
22.150	4.5903	1.53	.Q	.	.	.	V	.
22.167	4.5924	1.52	.Q	.	.	.	V	.
22.183	4.5945	1.52	.Q	.	.	.	V	.
22.200	4.5966	1.52	.Q	.	.	.	V	.
22.217	4.5987	1.52	.Q	.	.	.	V	.
22.233	4.6008	1.52	.Q	.	.	.	V	.
22.250	4.6029	1.52	.Q	.	.	.	V	.
22.267	4.6050	1.51	.Q	.	.	.	V	.
22.283	4.6070	1.51	.Q	.	.	.	V	.
22.300	4.6091	1.51	.Q	.	.	.	V	.
22.317	4.6112	1.51	.Q	.	.	.	V	.
22.333	4.6133	1.51	.Q	.	.	.	V	.
22.350	4.6153	1.50	.Q	.	.	.	V	.
22.367	4.6174	1.50	.Q	.	.	.	V	.
22.383	4.6195	1.50	.Q	.	.	.	V	.
22.400	4.6215	1.50	.Q	.	.	.	V	.
22.417	4.6236	1.50	.Q	.	.	.	V	.
22.433	4.6257	1.50	.Q	.	.	.	V	.
22.450	4.6277	1.49	.Q	.	.	.	V	.

22.467	4.6298	1.49	.Q	.	.	.	V .
22.483	4.6318	1.49	.Q	.	.	.	V .
22.500	4.6339	1.49	.Q	.	.	.	V .
22.517	4.6359	1.49	.Q	.	.	.	V .
22.533	4.6380	1.49	.Q	.	.	.	V .
22.550	4.6400	1.48	.Q	.	.	.	V .
22.567	4.6421	1.48	.Q	.	.	.	V .
22.583	4.6441	1.48	.Q	.	.	.	V .
22.600	4.6461	1.48	.Q	.	.	.	V .
22.617	4.6482	1.48	.Q	.	.	.	V .
22.633	4.6502	1.48	.Q	.	.	.	V .
22.650	4.6522	1.47	.Q	.	.	.	V .
22.667	4.6543	1.47	.Q	.	.	.	V .
22.683	4.6563	1.47	.Q	.	.	.	V .
22.700	4.6583	1.47	.Q	.	.	.	V .
22.717	4.6603	1.47	.Q	.	.	.	V .
22.733	4.6624	1.47	.Q	.	.	.	V .
22.750	4.6644	1.46	.Q	.	.	.	V .
22.767	4.6664	1.46	.Q	.	.	.	V .
22.783	4.6684	1.46	.Q	.	.	.	V .
22.800	4.6704	1.46	.Q	.	.	.	V .
22.817	4.6724	1.46	.Q	.	.	.	V .
22.833	4.6744	1.46	.Q	.	.	.	V .
22.850	4.6764	1.45	.Q	.	.	.	V .
22.867	4.6784	1.45	.Q	.	.	.	V .
22.883	4.6804	1.45	.Q	.	.	.	V .
22.900	4.6824	1.45	.Q	.	.	.	V .
22.917	4.6844	1.45	.Q	.	.	.	V .
22.933	4.6864	1.45	.Q	.	.	.	V .
22.950	4.6884	1.45	.Q	.	.	.	V .
22.967	4.6904	1.44	.Q	.	.	.	V .
22.983	4.6924	1.44	.Q	.	.	.	V .
23.000	4.6944	1.44	.Q	.	.	.	V .
23.017	4.6964	1.44	.Q	.	.	.	V .
23.033	4.6983	1.44	.Q	.	.	.	V.
23.050	4.7003	1.44	.Q	.	.	.	V.
23.067	4.7023	1.43	.Q	.	.	.	V.
23.083	4.7043	1.43	.Q	.	.	.	V.
23.100	4.7062	1.43	.Q	.	.	.	V.
23.117	4.7082	1.43	.Q	.	.	.	V.
23.133	4.7102	1.43	.Q	.	.	.	V.
23.150	4.7121	1.43	.Q	.	.	.	V.
23.167	4.7141	1.43	.Q	.	.	.	V.
23.183	4.7161	1.42	.Q	.	.	.	V.
23.200	4.7180	1.42	.Q	.	.	.	V.
23.217	4.7200	1.42	.Q	.	.	.	V.
23.233	4.7219	1.42	.Q	.	.	.	V.
23.250	4.7239	1.42	.Q	.	.	.	V.
23.267	4.7259	1.42	.Q	.	.	.	V.
23.283	4.7278	1.42	.Q	.	.	.	V.
23.300	4.7297	1.41	.Q	.	.	.	V.
23.317	4.7317	1.41	.Q	.	.	.	V.
23.333	4.7336	1.41	.Q	.	.	.	V.
23.350	4.7356	1.41	.Q	.	.	.	V.
23.367	4.7375	1.41	.Q	.	.	.	V.
23.383	4.7395	1.41	.Q	.	.	.	V.
23.400	4.7414	1.41	.Q	.	.	.	V.
23.417	4.7433	1.40	.Q	.	.	.	V.
23.433	4.7453	1.40	.Q	.	.	.	V.
23.450	4.7472	1.40	.Q	.	.	.	V.
23.467	4.7491	1.40	.Q	.	.	.	V.
23.483	4.7510	1.40	.Q	.	.	.	V.
23.500	4.7530	1.40	.Q	.	.	.	V.
23.517	4.7549	1.40	.Q	.	.	.	V.
23.533	4.7568	1.39	.Q	.	.	.	V.
23.550	4.7587	1.39	.Q	.	.	.	V.
23.567	4.7607	1.39	.Q	.	.	.	V.
23.583	4.7626	1.39	.Q	.	.	.	V.
23.600	4.7645	1.39	.Q	.	.	.	V.
23.617	4.7664	1.39	.Q	.	.	.	V.
23.633	4.7683	1.39	.Q	.	.	.	V.
23.650	4.7702	1.39	.Q	.	.	.	V.
23.667	4.7721	1.38	.Q	.	.	.	V.
23.683	4.7740	1.38	.Q	.	.	.	V.
23.700	4.7759	1.38	.Q	.	.	.	V.
23.717	4.7778	1.38	.Q	.	.	.	V.
23.733	4.7797	1.38	.Q	.	.	.	V.
23.750	4.7816	1.38	.Q	.	.	.	V.
23.767	4.7835	1.38	.Q	.	.	.	V.

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  23.783      4.7854      1.37  .Q        .         .         .        V.
  23.800      4.7873      1.37  .Q        .         .         .        V.
  23.817      4.7892      1.37  .Q        .         .         .        V.
  23.833      4.7911      1.37  .Q        .         .         .        V.
  23.850      4.7930      1.37  .Q        .         .         .        V.
  23.867      4.7949      1.37  .Q        .         .         .        V.
  23.883      4.7967      1.37  .Q        .         .         .        V.
  23.900      4.7986      1.37  .Q        .         .         .        V.
  23.917      4.8005      1.36  .Q        .         .         .        V.
  23.933      4.8024      1.36  .Q        .         .         .        V.
  23.950      4.8043      1.36  .Q        .         .         .        V.
  23.967      4.8061      1.36  .Q        .         .         .        V.
  23.983      4.8080      1.36  .Q        .         .         .        V.
  24.000      4.8099      1.36  .Q        .         .         .        V.
  24.017      4.8116      1.27  .Q        .         .         .        V.
  24.033      4.8131      1.09  .Q        .         .         .        V.
  24.050      4.8144      0.91  Q         .         .         .        V.
  24.067      4.8154      0.72  Q         .         .         .        V.
  24.083      4.8161      0.54  Q         .         .         .        V.
  24.100      4.8166      0.36  Q         .         .         .        V.
  24.117      4.8169      0.18  Q         .         .         .         V
--------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated               Duration
       Peak Flow Rate                    (minutes)
   ======================              =========
              0%                        1447.0
             10%                         580.0
             20%                         125.0
             30%                          75.0
             40%                          60.0
             50%                          50.0
             60%                          40.0
             70%                          30.0
             80%                          20.0
             90%                          10.0


********************************************************************************
  FLOW PROCESS FROM NODE    238.00 TO NODE    238.00 IS CODE = 3.2
--------------------------------------------------------------------------------
  >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
================================================================================

                    INFLOW
                   (STREAM 1)
                        |
                        |
                        V                __effective depth
                    -----------          |   (and volume)
                   |           |    |    |
                   |           |    |....V........
                   | detention |<-->|           outflow
                   |   basin   |    |.........._______
                    -----------     |    ^    |  \
                        |           |  dead   |   basin outlet
                        V           | storage |
                     OUTFLOW         ---------
                   (STREAM 1)



          ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
          THROUGH A FLOW-THROUGH DETENTION BASIN
          SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
            DEAD STORAGE(AF) =      0.000
            SPECIFIED DEAD STORAGE(AF) FILLED =      0.000
            SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET =      0.000
            DETENTION BASIN CONSTANT LOSS RATE(CFS) =    0.00


          BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

           INTERVAL    DEPTH      OUTFLOW     STORAGE
            NUMBER      (FT)       (CFS)       (AF)
                1        0.00        0.00       0.000
```

2	0.10	23.55	0.003
3	0.20	23.70	0.015
4	0.30	23.85	0.053
5	0.40	24.01	0.120
6	0.50	24.16	0.217
7	0.60	24.31	0.340
8	0.70	24.45	0.487
9	0.80	24.60	0.655

==========

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(1-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.017	0.000	0.09	0.00	0.00	0.1	0.000
0.033	0.000	0.27	0.00	0.00	0.3	0.000
0.050	0.000	0.45	0.00	0.00	0.4	0.000
0.067	0.000	0.63	0.00	0.00	0.6	0.000
0.083	0.000	0.81	0.00	0.00	0.8	0.000
0.100	0.000	0.99	0.00	0.00	1.0	0.000
0.117	0.000	1.17	0.00	0.01	1.2	0.000
0.133	0.000	1.33	0.00	0.01	1.3	0.000
0.150	0.000	1.35	0.00	0.01	1.4	0.000
0.167	0.000	1.35	0.00	0.01	1.3	0.000
0.183	0.000	1.35	0.00	0.01	1.4	0.000
0.200	0.000	1.35	0.00	0.01	1.4	0.000
0.217	0.000	1.35	0.00	0.01	1.4	0.000
0.233	0.000	1.35	0.00	0.01	1.4	0.000
0.250	0.000	1.35	0.00	0.01	1.4	0.000
0.267	0.000	1.35	0.00	0.01	1.4	0.000
0.283	0.000	1.36	0.00	0.01	1.4	0.000
0.300	0.000	1.36	0.00	0.01	1.4	0.000
0.317	0.000	1.36	0.00	0.01	1.4	0.000
0.333	0.000	1.36	0.00	0.01	1.4	0.000
0.350	0.000	1.36	0.00	0.01	1.4	0.000
0.367	0.000	1.36	0.00	0.01	1.4	0.000
0.383	0.000	1.36	0.00	0.01	1.4	0.000
0.400	0.000	1.36	0.00	0.01	1.4	0.000
0.417	0.000	1.36	0.00	0.01	1.4	0.000
0.433	0.000	1.36	0.00	0.01	1.4	0.000
0.450	0.000	1.36	0.00	0.01	1.4	0.000
0.467	0.000	1.36	0.00	0.01	1.4	0.000
0.483	0.000	1.36	0.00	0.01	1.4	0.000
0.500	0.000	1.36	0.00	0.01	1.4	0.000
0.517	0.000	1.36	0.00	0.01	1.4	0.000
0.533	0.000	1.37	0.00	0.01	1.4	0.000
0.550	0.000	1.37	0.00	0.01	1.4	0.000
0.567	0.000	1.37	0.00	0.01	1.4	0.000
0.583	0.000	1.37	0.00	0.01	1.4	0.000
0.600	0.000	1.37	0.00	0.01	1.4	0.000
0.617	0.000	1.37	0.00	0.01	1.4	0.000
0.633	0.000	1.37	0.00	0.01	1.4	0.000
0.650	0.000	1.37	0.00	0.01	1.4	0.000
0.667	0.000	1.37	0.00	0.01	1.4	0.000
0.683	0.000	1.37	0.00	0.01	1.4	0.000
0.700	0.000	1.37	0.00	0.01	1.4	0.000
0.717	0.000	1.37	0.00	0.01	1.4	0.000
0.733	0.000	1.37	0.00	0.01	1.4	0.000
0.750	0.000	1.37	0.00	0.01	1.4	0.000
0.767	0.000	1.37	0.00	0.01	1.4	0.000
0.783	0.000	1.37	0.00	0.01	1.4	0.000
0.800	0.000	1.38	0.00	0.01	1.4	0.000
0.817	0.000	1.38	0.00	0.01	1.4	0.000
0.833	0.000	1.38	0.00	0.01	1.4	0.000
0.850	0.000	1.38	0.00	0.01	1.4	0.000
0.867	0.000	1.38	0.00	0.01	1.4	0.000
0.883	0.000	1.38	0.00	0.01	1.4	0.000
0.900	0.000	1.38	0.00	0.01	1.4	0.000
0.917	0.000	1.38	0.00	0.01	1.4	0.000
0.933	0.000	1.38	0.00	0.01	1.4	0.000
0.950	0.000	1.38	0.00	0.01	1.4	0.000
0.967	0.000	1.38	0.00	0.01	1.4	0.000
0.983	0.000	1.38	0.00	0.01	1.4	0.000
1.000	0.000	1.38	0.00	0.01	1.4	0.000

1.017	0.000	1.38	0.00	0.01	1.4	0.000
1.033	0.000	1.38	0.00	0.01	1.4	0.000
1.050	0.000	1.39	0.00	0.01	1.4	0.000
1.067	0.000	1.39	0.00	0.01	1.4	0.000
1.083	0.000	1.39	0.00	0.01	1.4	0.000
1.100	0.000	1.39	0.00	0.01	1.4	0.000
1.117	0.000	1.39	0.00	0.01	1.4	0.000
1.133	0.000	1.39	0.00	0.01	1.4	0.000
1.150	0.000	1.39	0.00	0.01	1.4	0.000
1.167	0.000	1.39	0.00	0.01	1.4	0.000
1.183	0.000	1.39	0.00	0.01	1.4	0.000
1.200	0.000	1.39	0.00	0.01	1.4	0.000
1.217	0.000	1.39	0.00	0.01	1.4	0.000
1.233	0.000	1.39	0.00	0.01	1.4	0.000
1.250	0.000	1.39	0.00	0.01	1.4	0.000
1.267	0.000	1.39	0.00	0.01	1.4	0.000
1.283	0.000	1.39	0.00	0.01	1.4	0.000
1.300	0.000	1.40	0.00	0.01	1.4	0.000
1.317	0.000	1.40	0.00	0.01	1.4	0.000
1.333	0.000	1.40	0.00	0.01	1.4	0.000
1.350	0.000	1.40	0.00	0.01	1.4	0.000
1.367	0.000	1.40	0.00	0.01	1.4	0.000
1.383	0.000	1.40	0.00	0.01	1.4	0.000
1.400	0.000	1.40	0.00	0.01	1.4	0.000
1.417	0.000	1.40	0.00	0.01	1.4	0.000
1.433	0.000	1.40	0.00	0.01	1.4	0.000
1.450	0.000	1.40	0.00	0.01	1.4	0.000
1.467	0.000	1.40	0.00	0.01	1.4	0.000
1.483	0.000	1.40	0.00	0.01	1.4	0.000
1.500	0.000	1.40	0.00	0.01	1.4	0.000
1.517	0.000	1.40	0.00	0.01	1.4	0.000
1.533	0.000	1.41	0.00	0.01	1.4	0.000
1.550	0.000	1.41	0.00	0.01	1.4	0.000
1.567	0.000	1.41	0.00	0.01	1.4	0.000
1.583	0.000	1.41	0.00	0.01	1.4	0.000
1.600	0.000	1.41	0.00	0.01	1.4	0.000
1.617	0.000	1.41	0.00	0.01	1.4	0.000
1.633	0.000	1.41	0.00	0.01	1.4	0.000
1.650	0.000	1.41	0.00	0.01	1.4	0.000
1.667	0.000	1.41	0.00	0.01	1.4	0.000
1.683	0.000	1.41	0.00	0.01	1.4	0.000
1.700	0.000	1.41	0.00	0.01	1.4	0.000
1.717	0.000	1.41	0.00	0.01	1.4	0.000
1.733	0.000	1.41	0.00	0.01	1.4	0.000
1.750	0.000	1.41	0.00	0.01	1.4	0.000
1.767	0.000	1.41	0.00	0.01	1.4	0.000
1.783	0.000	1.42	0.00	0.01	1.4	0.000
1.800	0.000	1.42	0.00	0.01	1.4	0.000
1.817	0.000	1.42	0.00	0.01	1.4	0.000
1.833	0.000	1.42	0.00	0.01	1.4	0.000
1.850	0.000	1.42	0.00	0.01	1.4	0.000
1.867	0.000	1.42	0.00	0.01	1.4	0.000
1.883	0.000	1.42	0.00	0.01	1.4	0.000
1.900	0.000	1.42	0.00	0.01	1.4	0.000
1.917	0.000	1.42	0.00	0.01	1.4	0.000
1.933	0.000	1.42	0.00	0.01	1.4	0.000
1.950	0.000	1.42	0.00	0.01	1.4	0.000
1.967	0.000	1.42	0.00	0.01	1.4	0.000
1.983	0.000	1.42	0.00	0.01	1.4	0.000
2.000	0.000	1.43	0.00	0.01	1.4	0.000
2.017	0.000	1.43	0.00	0.01	1.4	0.000
2.033	0.000	1.43	0.00	0.01	1.4	0.000
2.050	0.000	1.43	0.00	0.01	1.4	0.000
2.067	0.000	1.43	0.00	0.01	1.4	0.000
2.083	0.000	1.43	0.00	0.01	1.4	0.000
2.100	0.000	1.43	0.00	0.01	1.4	0.000
2.117	0.000	1.43	0.00	0.01	1.4	0.000
2.133	0.000	1.43	0.00	0.01	1.4	0.000
2.150	0.000	1.43	0.00	0.01	1.4	0.000
2.167	0.000	1.43	0.00	0.01	1.4	0.000
2.183	0.000	1.43	0.00	0.01	1.4	0.000
2.200	0.000	1.43	0.00	0.01	1.4	0.000
2.217	0.000	1.44	0.00	0.01	1.4	0.000
2.233	0.000	1.44	0.00	0.01	1.4	0.000
2.250	0.000	1.44	0.00	0.01	1.4	0.000
2.267	0.000	1.44	0.00	0.01	1.4	0.000
2.283	0.000	1.44	0.00	0.01	1.4	0.000
2.300	0.000	1.44	0.00	0.01	1.4	0.000
2.317	0.000	1.44	0.00	0.01	1.4	0.000

2.333	0.000	1.44	0.00	0.01	1.4	0.000
2.350	0.000	1.44	0.00	0.01	1.4	0.000
2.367	0.000	1.44	0.00	0.01	1.4	0.000
2.383	0.000	1.44	0.00	0.01	1.4	0.000
2.400	0.000	1.44	0.00	0.01	1.4	0.000
2.417	0.000	1.45	0.00	0.01	1.4	0.000
2.433	0.000	1.45	0.00	0.01	1.4	0.000
2.450	0.000	1.45	0.00	0.01	1.4	0.000
2.467	0.000	1.45	0.00	0.01	1.4	0.000
2.483	0.000	1.45	0.00	0.01	1.4	0.000
2.500	0.000	1.45	0.00	0.01	1.4	0.000
2.517	0.000	1.45	0.00	0.01	1.4	0.000
2.533	0.000	1.45	0.00	0.01	1.4	0.000
2.550	0.000	1.45	0.00	0.01	1.5	0.000
2.567	0.000	1.45	0.00	0.01	1.5	0.000
2.583	0.000	1.45	0.00	0.01	1.5	0.000
2.600	0.000	1.45	0.00	0.01	1.5	0.000
2.617	0.000	1.45	0.00	0.01	1.5	0.000
2.633	0.000	1.46	0.00	0.01	1.5	0.000
2.650	0.000	1.46	0.00	0.01	1.5	0.000
2.667	0.000	1.46	0.00	0.01	1.5	0.000
2.683	0.000	1.46	0.00	0.01	1.5	0.000
2.700	0.000	1.46	0.00	0.01	1.5	0.000
2.717	0.000	1.46	0.00	0.01	1.5	0.000
2.733	0.000	1.46	0.00	0.01	1.5	0.000
2.750	0.000	1.46	0.00	0.01	1.5	0.000
2.767	0.000	1.46	0.00	0.01	1.5	0.000
2.783	0.000	1.46	0.00	0.01	1.5	0.000
2.800	0.000	1.46	0.00	0.01	1.5	0.000
2.817	0.000	1.46	0.00	0.01	1.5	0.000
2.833	0.000	1.46	0.00	0.01	1.5	0.000
2.850	0.000	1.47	0.00	0.01	1.5	0.000
2.867	0.000	1.47	0.00	0.01	1.5	0.000
2.883	0.000	1.47	0.00	0.01	1.5	0.000
2.900	0.000	1.47	0.00	0.01	1.5	0.000
2.917	0.000	1.47	0.00	0.01	1.5	0.000
2.933	0.000	1.47	0.00	0.01	1.5	0.000
2.950	0.000	1.47	0.00	0.01	1.5	0.000
2.967	0.000	1.47	0.00	0.01	1.5	0.000
2.983	0.000	1.47	0.00	0.01	1.5	0.000
3.000	0.000	1.47	0.00	0.01	1.5	0.000
3.017	0.000	1.47	0.00	0.01	1.5	0.000
3.033	0.000	1.47	0.00	0.01	1.5	0.000
3.050	0.000	1.47	0.00	0.01	1.5	0.000
3.067	0.000	1.48	0.00	0.01	1.5	0.000
3.083	0.000	1.48	0.00	0.01	1.5	0.000
3.100	0.000	1.48	0.00	0.01	1.5	0.000
3.117	0.000	1.48	0.00	0.01	1.5	0.000
3.133	0.000	1.48	0.00	0.01	1.5	0.000
3.150	0.000	1.48	0.00	0.01	1.5	0.000
3.167	0.000	1.48	0.00	0.01	1.5	0.000
3.183	0.000	1.48	0.00	0.01	1.5	0.000
3.200	0.000	1.48	0.00	0.01	1.5	0.000
3.217	0.000	1.48	0.00	0.01	1.5	0.000
3.233	0.000	1.48	0.00	0.01	1.5	0.000
3.250	0.000	1.48	0.00	0.01	1.5	0.000
3.267	0.000	1.48	0.00	0.01	1.5	0.000
3.283	0.000	1.49	0.00	0.01	1.5	0.000
3.300	0.000	1.49	0.00	0.01	1.5	0.000
3.317	0.000	1.49	0.00	0.01	1.5	0.000
3.333	0.000	1.49	0.00	0.01	1.5	0.000
3.350	0.000	1.49	0.00	0.01	1.5	0.000
3.367	0.000	1.49	0.00	0.01	1.5	0.000
3.383	0.000	1.49	0.00	0.01	1.5	0.000
3.400	0.000	1.49	0.00	0.01	1.5	0.000
3.417	0.000	1.49	0.00	0.01	1.5	0.000
3.433	0.000	1.49	0.00	0.01	1.5	0.000
3.450	0.000	1.49	0.00	0.01	1.5	0.000
3.467	0.000	1.50	0.00	0.01	1.5	0.000
3.483	0.000	1.50	0.00	0.01	1.5	0.000
3.500	0.000	1.50	0.00	0.01	1.5	0.000
3.517	0.000	1.50	0.00	0.01	1.5	0.000
3.533	0.000	1.50	0.00	0.01	1.5	0.000
3.550	0.000	1.50	0.00	0.01	1.5	0.000
3.567	0.000	1.50	0.00	0.01	1.5	0.000
3.583	0.000	1.50	0.00	0.01	1.5	0.000
3.600	0.000	1.50	0.00	0.01	1.5	0.000
3.617	0.000	1.50	0.00	0.01	1.5	0.000
3.633	0.000	1.51	0.00	0.01	1.5	0.000

3.650	0.000	1.51	0.00	0.01	1.5	0.000
3.667	0.000	1.51	0.00	0.01	1.5	0.000
3.683	0.000	1.51	0.00	0.01	1.5	0.000
3.700	0.000	1.51	0.00	0.01	1.5	0.000
3.717	0.000	1.51	0.00	0.01	1.5	0.000
3.733	0.000	1.51	0.00	0.01	1.5	0.000
3.750	0.000	1.51	0.00	0.01	1.5	0.000
3.767	0.000	1.51	0.00	0.01	1.5	0.000
3.783	0.000	1.51	0.00	0.01	1.5	0.000
3.800	0.000	1.51	0.00	0.01	1.5	0.000
3.817	0.000	1.51	0.00	0.01	1.5	0.000
3.833	0.000	1.52	0.00	0.01	1.5	0.000
3.850	0.000	1.52	0.00	0.01	1.5	0.000
3.867	0.000	1.52	0.00	0.01	1.5	0.000
3.883	0.000	1.52	0.00	0.01	1.5	0.000
3.900	0.000	1.52	0.00	0.01	1.5	0.000
3.917	0.000	1.52	0.00	0.01	1.5	0.000
3.933	0.000	1.52	0.00	0.01	1.5	0.000
3.950	0.000	1.52	0.00	0.01	1.5	0.000
3.967	0.000	1.52	0.00	0.01	1.5	0.000
3.983	0.000	1.52	0.00	0.01	1.5	0.000
4.000	0.000	1.52	0.00	0.01	1.5	0.000
4.017	0.000	1.52	0.00	0.01	1.5	0.000
4.033	0.000	1.53	0.00	0.01	1.5	0.000
4.050	0.000	1.53	0.00	0.01	1.5	0.000
4.067	0.000	1.53	0.00	0.01	1.5	0.000
4.083	0.000	1.53	0.00	0.01	1.5	0.000
4.100	0.000	1.53	0.00	0.01	1.5	0.000
4.117	0.000	1.53	0.00	0.01	1.5	0.000
4.133	0.000	1.53	0.00	0.01	1.5	0.000
4.150	0.000	1.53	0.00	0.01	1.5	0.000
4.167	0.000	1.53	0.00	0.01	1.5	0.000
4.183	0.000	1.53	0.00	0.01	1.5	0.000
4.200	0.000	1.53	0.00	0.01	1.5	0.000
4.217	0.000	1.54	0.00	0.01	1.5	0.000
4.233	0.000	1.54	0.00	0.01	1.5	0.000
4.250	0.000	1.54	0.00	0.01	1.5	0.000
4.267	0.000	1.54	0.00	0.01	1.5	0.000
4.283	0.000	1.54	0.00	0.01	1.5	0.000
4.300	0.000	1.54	0.00	0.01	1.5	0.000
4.317	0.000	1.54	0.00	0.01	1.5	0.000
4.333	0.000	1.54	0.00	0.01	1.5	0.000
4.350	0.000	1.54	0.00	0.01	1.5	0.000
4.367	0.000	1.55	0.00	0.01	1.5	0.000
4.383	0.000	1.55	0.00	0.01	1.5	0.000
4.400	0.000	1.55	0.00	0.01	1.5	0.000
4.417	0.000	1.55	0.00	0.01	1.5	0.000
4.433	0.000	1.55	0.00	0.01	1.5	0.000
4.450	0.000	1.55	0.00	0.01	1.5	0.000
4.467	0.000	1.55	0.00	0.01	1.5	0.000
4.483	0.000	1.55	0.00	0.01	1.6	0.000
4.500	0.000	1.55	0.00	0.01	1.6	0.000
4.517	0.000	1.55	0.00	0.01	1.6	0.000
4.533	0.000	1.55	0.00	0.01	1.6	0.000
4.550	0.000	1.55	0.00	0.01	1.6	0.000
4.567	0.000	1.56	0.00	0.01	1.6	0.000
4.583	0.000	1.56	0.00	0.01	1.6	0.000
4.600	0.000	1.56	0.00	0.01	1.6	0.000
4.617	0.000	1.56	0.00	0.01	1.6	0.000
4.633	0.000	1.56	0.00	0.01	1.6	0.000
4.650	0.000	1.56	0.00	0.01	1.6	0.000
4.667	0.000	1.56	0.00	0.01	1.6	0.000
4.683	0.000	1.56	0.00	0.01	1.6	0.000
4.700	0.000	1.56	0.00	0.01	1.6	0.000
4.717	0.000	1.56	0.00	0.01	1.6	0.000
4.733	0.000	1.57	0.00	0.01	1.6	0.000
4.750	0.000	1.57	0.00	0.01	1.6	0.000
4.767	0.000	1.57	0.00	0.01	1.6	0.000
4.783	0.000	1.57	0.00	0.01	1.6	0.000
4.800	0.000	1.57	0.00	0.01	1.6	0.000
4.817	0.000	1.57	0.00	0.01	1.6	0.000
4.833	0.000	1.57	0.00	0.01	1.6	0.000
4.850	0.000	1.57	0.00	0.01	1.6	0.000
4.867	0.000	1.58	0.00	0.01	1.6	0.000
4.883	0.000	1.58	0.00	0.01	1.6	0.000
4.900	0.000	1.58	0.00	0.01	1.6	0.000
4.917	0.000	1.58	0.00	0.01	1.6	0.000
4.933	0.000	1.58	0.00	0.01	1.6	0.000
4.950	0.000	1.58	0.00	0.01	1.6	0.000

4.967	0.000	1.58	0.00	0.01	1.6	0.000
4.983	0.000	1.58	0.00	0.01	1.6	0.000
5.000	0.000	1.58	0.00	0.01	1.6	0.000
5.017	0.000	1.58	0.00	0.01	1.6	0.000
5.033	0.000	1.58	0.00	0.01	1.6	0.000
5.050	0.000	1.58	0.00	0.01	1.6	0.000
5.067	0.000	1.59	0.00	0.01	1.6	0.000
5.083	0.000	1.59	0.00	0.01	1.6	0.000
5.100	0.000	1.59	0.00	0.01	1.6	0.000
5.117	0.000	1.59	0.00	0.01	1.6	0.000
5.133	0.000	1.59	0.00	0.01	1.6	0.000
5.150	0.000	1.59	0.00	0.01	1.6	0.000
5.167	0.000	1.59	0.00	0.01	1.6	0.000
5.183	0.000	1.59	0.00	0.01	1.6	0.000
5.200	0.000	1.59	0.00	0.01	1.6	0.000
5.217	0.000	1.60	0.00	0.01	1.6	0.000
5.233	0.000	1.60	0.00	0.01	1.6	0.000
5.250	0.000	1.60	0.00	0.01	1.6	0.000
5.267	0.000	1.60	0.00	0.01	1.6	0.000
5.283	0.000	1.60	0.00	0.01	1.6	0.000
5.300	0.000	1.60	0.00	0.01	1.6	0.000
5.317	0.000	1.60	0.00	0.01	1.6	0.000
5.333	0.000	1.60	0.00	0.01	1.6	0.000
5.350	0.000	1.61	0.00	0.01	1.6	0.000
5.367	0.000	1.61	0.00	0.01	1.6	0.000
5.383	0.000	1.61	0.00	0.01	1.6	0.000
5.400	0.000	1.61	0.00	0.01	1.6	0.000
5.417	0.000	1.61	0.00	0.01	1.6	0.000
5.433	0.000	1.61	0.00	0.01	1.6	0.000
5.450	0.000	1.61	0.00	0.01	1.6	0.000
5.467	0.000	1.61	0.00	0.01	1.6	0.000
5.483	0.000	1.61	0.00	0.01	1.6	0.000
5.500	0.000	1.61	0.00	0.01	1.6	0.000
5.517	0.000	1.61	0.00	0.01	1.6	0.000
5.533	0.000	1.62	0.00	0.01	1.6	0.000
5.550	0.000	1.62	0.00	0.01	1.6	0.000
5.567	0.000	1.62	0.00	0.01	1.6	0.000
5.583	0.000	1.62	0.00	0.01	1.6	0.000
5.600	0.000	1.62	0.00	0.01	1.6	0.000
5.617	0.000	1.62	0.00	0.01	1.6	0.000
5.633	0.000	1.62	0.00	0.01	1.6	0.000
5.650	0.000	1.63	0.00	0.01	1.6	0.000
5.667	0.000	1.63	0.00	0.01	1.6	0.000
5.683	0.000	1.63	0.00	0.01	1.6	0.000
5.700	0.000	1.63	0.00	0.01	1.6	0.000
5.717	0.000	1.63	0.00	0.01	1.6	0.000
5.733	0.000	1.63	0.00	0.01	1.6	0.000
5.750	0.000	1.63	0.00	0.01	1.6	0.000
5.767	0.000	1.63	0.00	0.01	1.6	0.000
5.783	0.000	1.63	0.00	0.01	1.6	0.000
5.800	0.000	1.63	0.00	0.01	1.6	0.000
5.817	0.000	1.64	0.00	0.01	1.6	0.000
5.833	0.000	1.64	0.00	0.01	1.6	0.000
5.850	0.000	1.64	0.00	0.01	1.6	0.000
5.867	0.000	1.64	0.00	0.01	1.6	0.000
5.883	0.000	1.64	0.00	0.01	1.6	0.000
5.900	0.000	1.64	0.00	0.01	1.6	0.000
5.917	0.000	1.64	0.00	0.01	1.6	0.000
5.933	0.000	1.64	0.00	0.01	1.6	0.000
5.950	0.000	1.64	0.00	0.01	1.6	0.000
5.967	0.000	1.65	0.00	0.01	1.6	0.000
5.983	0.000	1.65	0.00	0.01	1.6	0.000
6.000	0.000	1.65	0.00	0.01	1.6	0.000
6.017	0.000	1.65	0.00	0.01	1.6	0.000
6.033	0.000	1.65	0.00	0.01	1.6	0.000
6.050	0.000	1.65	0.00	0.01	1.7	0.000
6.067	0.000	1.65	0.00	0.01	1.7	0.000
6.083	0.000	1.65	0.00	0.01	1.7	0.000
6.100	0.000	1.66	0.00	0.01	1.7	0.000
6.117	0.000	1.66	0.00	0.01	1.7	0.000
6.133	0.000	1.66	0.00	0.01	1.7	0.000
6.150	0.000	1.66	0.00	0.01	1.7	0.000
6.167	0.000	1.66	0.00	0.01	1.7	0.000
6.183	0.000	1.66	0.00	0.01	1.7	0.000
6.200	0.000	1.66	0.00	0.01	1.7	0.000
6.217	0.000	1.66	0.00	0.01	1.7	0.000
6.233	0.000	1.66	0.00	0.01	1.7	0.000
6.250	0.000	1.67	0.00	0.01	1.7	0.000
6.267	0.000	1.67	0.00	0.01	1.7	0.000

6.283	0.000	1.67	0.00	0.01	1.7	0.000
6.300	0.000	1.67	0.00	0.01	1.7	0.000
6.317	0.000	1.67	0.00	0.01	1.7	0.000
6.333	0.000	1.67	0.00	0.01	1.7	0.000
6.350	0.000	1.67	0.00	0.01	1.7	0.000
6.367	0.000	1.68	0.00	0.01	1.7	0.000
6.383	0.000	1.68	0.00	0.01	1.7	0.000
6.400	0.000	1.68	0.00	0.01	1.7	0.000
6.417	0.000	1.68	0.00	0.01	1.7	0.000
6.433	0.000	1.68	0.00	0.01	1.7	0.000
6.450	0.000	1.68	0.00	0.01	1.7	0.000
6.467	0.000	1.68	0.00	0.01	1.7	0.000
6.483	0.000	1.68	0.00	0.01	1.7	0.000
6.500	0.000	1.68	0.00	0.01	1.7	0.000
6.517	0.000	1.69	0.00	0.01	1.7	0.000
6.533	0.000	1.69	0.00	0.01	1.7	0.000
6.550	0.000	1.69	0.00	0.01	1.7	0.000
6.567	0.000	1.69	0.00	0.01	1.7	0.000
6.583	0.000	1.69	0.00	0.01	1.7	0.000
6.600	0.000	1.69	0.00	0.01	1.7	0.000
6.617	0.000	1.70	0.00	0.01	1.7	0.000
6.633	0.000	1.70	0.00	0.01	1.7	0.000
6.650	0.000	1.70	0.00	0.01	1.7	0.000
6.667	0.000	1.70	0.00	0.01	1.7	0.000
6.683	0.000	1.70	0.00	0.01	1.7	0.000
6.700	0.000	1.70	0.00	0.01	1.7	0.000
6.717	0.000	1.70	0.00	0.01	1.7	0.000
6.733	0.000	1.70	0.00	0.01	1.7	0.000
6.750	0.000	1.70	0.00	0.01	1.7	0.000
6.767	0.000	1.70	0.00	0.01	1.7	0.000
6.783	0.000	1.71	0.00	0.01	1.7	0.000
6.800	0.000	1.71	0.00	0.01	1.7	0.000
6.817	0.000	1.71	0.00	0.01	1.7	0.000
6.833	0.000	1.71	0.00	0.01	1.7	0.000
6.850	0.000	1.71	0.00	0.01	1.7	0.000
6.867	0.000	1.72	0.00	0.01	1.7	0.000
6.883	0.000	1.72	0.00	0.01	1.7	0.000
6.900	0.000	1.72	0.00	0.01	1.7	0.000
6.917	0.000	1.72	0.00	0.01	1.7	0.000
6.933	0.000	1.72	0.00	0.01	1.7	0.000
6.950	0.000	1.72	0.00	0.01	1.7	0.000
6.967	0.000	1.72	0.00	0.01	1.7	0.000
6.983	0.000	1.72	0.00	0.01	1.7	0.000
7.000	0.000	1.72	0.00	0.01	1.7	0.000
7.017	0.000	1.73	0.00	0.01	1.7	0.000
7.033	0.000	1.73	0.00	0.01	1.7	0.000
7.050	0.000	1.73	0.00	0.01	1.7	0.000
7.067	0.000	1.73	0.00	0.01	1.7	0.000
7.083	0.000	1.73	0.00	0.01	1.7	0.000
7.100	0.000	1.73	0.00	0.01	1.7	0.000
7.117	0.000	1.74	0.00	0.01	1.7	0.000
7.133	0.000	1.74	0.00	0.01	1.7	0.000
7.150	0.000	1.74	0.00	0.01	1.7	0.000
7.167	0.000	1.74	0.00	0.01	1.7	0.000
7.183	0.000	1.74	0.00	0.01	1.7	0.000
7.200	0.000	1.74	0.00	0.01	1.7	0.000
7.217	0.000	1.74	0.00	0.01	1.7	0.000
7.233	0.000	1.74	0.00	0.01	1.7	0.000
7.250	0.000	1.74	0.00	0.01	1.7	0.000
7.267	0.000	1.75	0.00	0.01	1.7	0.000
7.283	0.000	1.75	0.00	0.01	1.7	0.000
7.300	0.000	1.75	0.00	0.01	1.7	0.000
7.317	0.000	1.75	0.00	0.01	1.8	0.000
7.333	0.000	1.75	0.00	0.01	1.8	0.000
7.350	0.000	1.76	0.00	0.01	1.8	0.000
7.367	0.000	1.76	0.00	0.01	1.8	0.000
7.383	0.000	1.76	0.00	0.01	1.8	0.000
7.400	0.000	1.76	0.00	0.01	1.8	0.000
7.417	0.000	1.76	0.00	0.01	1.8	0.000
7.433	0.000	1.76	0.00	0.01	1.8	0.000
7.450	0.000	1.76	0.00	0.01	1.8	0.000
7.467	0.000	1.76	0.00	0.01	1.8	0.000
7.483	0.000	1.77	0.00	0.01	1.8	0.000
7.500	0.000	1.77	0.00	0.01	1.8	0.000
7.517	0.000	1.77	0.00	0.01	1.8	0.000
7.533	0.000	1.77	0.00	0.01	1.8	0.000
7.550	0.000	1.77	0.00	0.01	1.8	0.000
7.567	0.000	1.77	0.00	0.01	1.8	0.000
7.583	0.000	1.78	0.00	0.01	1.8	0.000

7.600	0.000	1.78	0.00	0.01	1.8	0.000
7.617	0.000	1.78	0.00	0.01	1.8	0.000
7.633	0.000	1.78	0.00	0.01	1.8	0.000
7.650	0.000	1.78	0.00	0.01	1.8	0.000
7.667	0.000	1.78	0.00	0.01	1.8	0.000
7.683	0.000	1.79	0.00	0.01	1.8	0.000
7.700	0.000	1.79	0.00	0.01	1.8	0.000
7.717	0.000	1.79	0.00	0.01	1.8	0.000
7.733	0.000	1.79	0.00	0.01	1.8	0.000
7.750	0.000	1.79	0.00	0.01	1.8	0.000
7.767	0.000	1.79	0.00	0.01	1.8	0.000
7.783	0.000	1.79	0.00	0.01	1.8	0.000
7.800	0.000	1.79	0.00	0.01	1.8	0.000
7.817	0.000	1.80	0.00	0.01	1.8	0.000
7.833	0.000	1.80	0.00	0.01	1.8	0.000
7.850	0.000	1.80	0.00	0.01	1.8	0.000
7.867	0.000	1.80	0.00	0.01	1.8	0.000
7.883	0.000	1.81	0.00	0.01	1.8	0.000
7.900	0.000	1.81	0.00	0.01	1.8	0.000
7.917	0.000	1.81	0.00	0.01	1.8	0.000
7.933	0.000	1.81	0.00	0.01	1.8	0.000
7.950	0.000	1.81	0.00	0.01	1.8	0.000
7.967	0.000	1.81	0.00	0.01	1.8	0.000
7.983	0.000	1.81	0.00	0.01	1.8	0.000
8.000	0.000	1.81	0.00	0.01	1.8	0.000
8.017	0.000	1.81	0.00	0.01	1.8	0.000
8.033	0.000	1.82	0.00	0.01	1.8	0.000
8.050	0.000	1.82	0.00	0.01	1.8	0.000
8.067	0.000	1.82	0.00	0.01	1.8	0.000
8.083	0.000	1.82	0.00	0.01	1.8	0.000
8.100	0.000	1.83	0.00	0.01	1.8	0.000
8.117	0.000	1.83	0.00	0.01	1.8	0.000
8.133	0.000	1.83	0.00	0.01	1.8	0.000
8.150	0.000	1.83	0.00	0.01	1.8	0.000
8.167	0.000	1.83	0.00	0.01	1.8	0.000
8.183	0.000	1.83	0.00	0.01	1.8	0.000
8.200	0.000	1.83	0.00	0.01	1.8	0.000
8.217	0.000	1.84	0.00	0.01	1.8	0.000
8.233	0.000	1.84	0.00	0.01	1.8	0.000
8.250	0.000	1.84	0.00	0.01	1.8	0.000
8.267	0.000	1.84	0.00	0.01	1.8	0.000
8.283	0.000	1.84	0.00	0.01	1.8	0.000
8.300	0.000	1.84	0.00	0.01	1.8	0.000
8.317	0.000	1.85	0.00	0.01	1.8	0.000
8.333	0.000	1.85	0.00	0.01	1.8	0.000
8.350	0.000	1.85	0.00	0.01	1.9	0.000
8.367	0.000	1.85	0.00	0.01	1.9	0.000
8.383	0.000	1.86	0.00	0.01	1.9	0.000
8.400	0.000	1.86	0.00	0.01	1.9	0.000
8.417	0.000	1.86	0.00	0.01	1.9	0.000
8.433	0.000	1.86	0.00	0.01	1.9	0.000
8.450	0.000	1.86	0.00	0.01	1.9	0.000
8.467	0.000	1.86	0.00	0.01	1.9	0.000
8.483	0.000	1.86	0.00	0.01	1.9	0.000
8.500	0.000	1.86	0.00	0.01	1.9	0.000
8.517	0.000	1.87	0.00	0.01	1.9	0.000
8.533	0.000	1.87	0.00	0.01	1.9	0.000
8.550	0.000	1.87	0.00	0.01	1.9	0.000
8.567	0.000	1.87	0.00	0.01	1.9	0.000
8.583	0.000	1.88	0.00	0.01	1.9	0.000
8.600	0.000	1.88	0.00	0.01	1.9	0.000
8.617	0.000	1.88	0.00	0.01	1.9	0.000
8.633	0.000	1.88	0.00	0.01	1.9	0.000
8.650	0.000	1.88	0.00	0.01	1.9	0.000
8.667	0.000	1.88	0.00	0.01	1.9	0.000
8.683	0.000	1.89	0.00	0.01	1.9	0.000
8.700	0.000	1.89	0.00	0.01	1.9	0.000
8.717	0.000	1.89	0.00	0.01	1.9	0.000
8.733	0.000	1.89	0.00	0.01	1.9	0.000
8.750	0.000	1.89	0.00	0.01	1.9	0.000
8.767	0.000	1.89	0.00	0.01	1.9	0.000
8.783	0.000	1.90	0.00	0.01	1.9	0.000
8.800	0.000	1.90	0.00	0.01	1.9	0.000
8.817	0.000	1.90	0.00	0.01	1.9	0.000
8.833	0.000	1.90	0.00	0.01	1.9	0.000
8.850	0.000	1.91	0.00	0.01	1.9	0.000
8.867	0.000	1.91	0.00	0.01	1.9	0.000
8.883	0.000	1.91	0.00	0.01	1.9	0.000
8.900	0.000	1.91	0.00	0.01	1.9	0.000

8.917	0.000	1.91	0.00	0.01	1.9	0.000
8.933	0.000	1.91	0.00	0.01	1.9	0.000
8.950	0.000	1.92	0.00	0.01	1.9	0.000
8.967	0.000	1.92	0.00	0.01	1.9	0.000
8.983	0.000	1.92	0.00	0.01	1.9	0.000
9.000	0.000	1.92	0.00	0.01	1.9	0.000
9.017	0.000	1.92	0.00	0.01	1.9	0.000
9.033	0.000	1.92	0.00	0.01	1.9	0.000
9.050	0.000	1.93	0.00	0.01	1.9	0.000
9.067	0.000	1.93	0.00	0.01	1.9	0.000
9.083	0.000	1.93	0.00	0.01	1.9	0.000
9.100	0.000	1.93	0.00	0.01	1.9	0.000
9.117	0.000	1.94	0.00	0.01	1.9	0.000
9.133	0.000	1.94	0.00	0.01	1.9	0.000
9.150	0.000	1.94	0.00	0.01	1.9	0.000
9.167	0.000	1.94	0.00	0.01	1.9	0.000
9.183	0.000	1.94	0.00	0.01	1.9	0.000
9.200	0.000	1.95	0.00	0.01	1.9	0.000
9.217	0.000	1.95	0.00	0.01	1.9	0.000
9.233	0.000	1.95	0.00	0.01	1.9	0.000
9.250	0.000	1.95	0.00	0.01	1.9	0.000
9.267	0.000	1.95	0.00	0.01	2.0	0.000
9.283	0.000	1.95	0.00	0.01	2.0	0.000
9.300	0.000	1.96	0.00	0.01	2.0	0.000
9.317	0.000	1.96	0.00	0.01	2.0	0.000
9.333	0.000	1.96	0.00	0.01	2.0	0.000
9.350	0.000	1.97	0.00	0.01	2.0	0.000
9.367	0.000	1.97	0.00	0.01	2.0	0.000
9.383	0.000	1.97	0.00	0.01	2.0	0.000
9.400	0.000	1.97	0.00	0.01	2.0	0.000
9.417	0.000	1.97	0.00	0.01	2.0	0.000
9.433	0.000	1.98	0.00	0.01	2.0	0.000
9.450	0.000	1.98	0.00	0.01	2.0	0.000
9.467	0.000	1.98	0.00	0.01	2.0	0.000
9.483	0.000	1.98	0.00	0.01	2.0	0.000
9.500	0.000	1.98	0.00	0.01	2.0	0.000
9.517	0.000	1.98	0.00	0.01	2.0	0.000
9.533	0.000	1.99	0.00	0.01	2.0	0.000
9.550	0.000	1.99	0.00	0.01	2.0	0.000
9.567	0.000	1.99	0.00	0.01	2.0	0.000
9.583	0.000	2.00	0.00	0.01	2.0	0.000
9.600	0.000	2.00	0.00	0.01	2.0	0.000
9.617	0.000	2.00	0.00	0.01	2.0	0.000
9.633	0.000	2.00	0.00	0.01	2.0	0.000
9.650	0.000	2.01	0.00	0.01	2.0	0.000
9.667	0.000	2.01	0.00	0.01	2.0	0.000
9.683	0.000	2.01	0.00	0.01	2.0	0.000
9.700	0.000	2.01	0.00	0.01	2.0	0.000
9.717	0.000	2.01	0.00	0.01	2.0	0.000
9.733	0.000	2.01	0.00	0.01	2.0	0.000
9.750	0.000	2.01	0.00	0.01	2.0	0.000
9.767	0.000	2.02	0.00	0.01	2.0	0.000
9.783	0.000	2.02	0.00	0.01	2.0	0.000
9.800	0.000	2.02	0.00	0.01	2.0	0.000
9.817	0.000	2.03	0.00	0.01	2.0	0.000
9.833	0.000	2.03	0.00	0.01	2.0	0.000
9.850	0.000	2.03	0.00	0.01	2.0	0.000
9.867	0.000	2.04	0.00	0.01	2.0	0.000
9.883	0.000	2.04	0.00	0.01	2.0	0.000
9.900	0.000	2.04	0.00	0.01	2.0	0.000
9.917	0.000	2.04	0.00	0.01	2.0	0.000
9.933	0.000	2.04	0.00	0.01	2.0	0.000
9.950	0.000	2.05	0.00	0.01	2.0	0.000
9.967	0.000	2.05	0.00	0.01	2.0	0.000
9.983	0.000	2.05	0.00	0.01	2.0	0.000
10.000	0.000	2.05	0.00	0.01	2.1	0.000
10.017	0.000	2.05	0.00	0.01	2.1	0.000
10.033	0.000	2.06	0.00	0.01	2.1	0.000
10.050	0.000	2.06	0.00	0.01	2.1	0.000
10.067	0.000	2.06	0.00	0.01	2.1	0.000
10.083	0.000	2.07	0.00	0.01	2.1	0.000
10.100	0.000	2.07	0.00	0.01	2.1	0.000
10.117	0.000	2.07	0.00	0.01	2.1	0.000
10.133	0.000	2.08	0.00	0.01	2.1	0.000
10.150	0.000	2.08	0.00	0.01	2.1	0.000
10.167	0.000	2.08	0.00	0.01	2.1	0.000
10.183	0.000	2.08	0.00	0.01	2.1	0.000
10.200	0.000	2.08	0.00	0.01	2.1	0.000
10.217	0.000	2.08	0.00	0.01	2.1	0.000

10.233	0.000	2.09	0.00	0.01	2.1	0.000
10.250	0.000	2.09	0.00	0.01	2.1	0.000
10.267	0.000	2.09	0.00	0.01	2.1	0.000
10.283	0.000	2.09	0.00	0.01	2.1	0.000
10.300	0.000	2.10	0.00	0.01	2.1	0.000
10.317	0.000	2.10	0.00	0.01	2.1	0.000
10.333	0.000	2.10	0.00	0.01	2.1	0.000
10.350	0.000	2.11	0.00	0.01	2.1	0.000
10.367	0.000	2.11	0.00	0.01	2.1	0.000
10.383	0.000	2.11	0.00	0.01	2.1	0.000
10.400	0.000	2.12	0.00	0.01	2.1	0.000
10.417	0.000	2.12	0.00	0.01	2.1	0.000
10.433	0.000	2.12	0.00	0.01	2.1	0.000
10.450	0.000	2.12	0.00	0.01	2.1	0.000
10.467	0.000	2.12	0.00	0.01	2.1	0.000
10.483	0.000	2.13	0.00	0.01	2.1	0.000
10.500	0.000	2.13	0.00	0.01	2.1	0.000
10.517	0.000	2.13	0.00	0.01	2.1	0.000
10.533	0.000	2.13	0.00	0.01	2.1	0.000
10.550	0.000	2.14	0.00	0.01	2.1	0.000
10.567	0.000	2.14	0.00	0.01	2.1	0.000
10.583	0.000	2.15	0.00	0.01	2.1	0.000
10.600	0.000	2.15	0.00	0.01	2.1	0.000
10.617	0.000	2.15	0.00	0.01	2.2	0.000
10.633	0.000	2.16	0.00	0.01	2.2	0.000
10.650	0.000	2.16	0.00	0.01	2.2	0.000
10.667	0.000	2.16	0.00	0.01	2.2	0.000
10.683	0.000	2.16	0.00	0.01	2.2	0.000
10.700	0.000	2.16	0.00	0.01	2.2	0.000
10.717	0.000	2.17	0.00	0.01	2.2	0.000
10.733	0.000	2.17	0.00	0.01	2.2	0.000
10.750	0.000	2.17	0.00	0.01	2.2	0.000
10.767	0.000	2.17	0.00	0.01	2.2	0.000
10.783	0.000	2.18	0.00	0.01	2.2	0.000
10.800	0.000	2.18	0.00	0.01	2.2	0.000
10.817	0.000	2.19	0.00	0.01	2.2	0.000
10.833	0.000	2.19	0.00	0.01	2.2	0.000
10.850	0.000	2.19	0.00	0.01	2.2	0.000
10.867	0.000	2.20	0.00	0.01	2.2	0.000
10.883	0.000	2.20	0.00	0.01	2.2	0.000
10.900	0.000	2.20	0.00	0.01	2.2	0.000
10.917	0.000	2.21	0.00	0.01	2.2	0.000
10.933	0.000	2.21	0.00	0.01	2.2	0.000
10.950	0.000	2.21	0.00	0.01	2.2	0.000
10.967	0.000	2.21	0.00	0.01	2.2	0.000
10.983	0.000	2.21	0.00	0.01	2.2	0.000
11.000	0.000	2.22	0.00	0.01	2.2	0.000
11.017	0.000	2.22	0.00	0.01	2.2	0.000
11.033	0.000	2.22	0.00	0.01	2.2	0.000
11.050	0.000	2.23	0.00	0.01	2.2	0.000
11.067	0.000	2.23	0.00	0.01	2.2	0.000
11.083	0.000	2.24	0.00	0.01	2.2	0.000
11.100	0.000	2.24	0.00	0.01	2.2	0.000
11.117	0.000	2.24	0.00	0.01	2.2	0.000
11.133	0.000	2.25	0.00	0.01	2.2	0.000
11.150	0.000	2.25	0.00	0.01	2.3	0.000
11.167	0.000	2.25	0.00	0.01	2.3	0.000
11.183	0.000	2.26	0.00	0.01	2.3	0.000
11.200	0.000	2.26	0.00	0.01	2.3	0.000
11.217	0.000	2.26	0.00	0.01	2.3	0.000
11.233	0.000	2.26	0.00	0.01	2.3	0.000
11.250	0.000	2.26	0.00	0.01	2.3	0.000
11.267	0.000	2.27	0.00	0.01	2.3	0.000
11.283	0.000	2.27	0.00	0.01	2.3	0.000
11.300	0.000	2.28	0.00	0.01	2.3	0.000
11.317	0.000	2.28	0.00	0.01	2.3	0.000
11.333	0.000	2.29	0.00	0.01	2.3	0.000
11.350	0.000	2.29	0.00	0.01	2.3	0.000
11.367	0.000	2.30	0.00	0.01	2.3	0.000
11.383	0.000	2.30	0.00	0.01	2.3	0.000
11.400	0.000	2.30	0.00	0.01	2.3	0.000
11.417	0.000	2.30	0.00	0.01	2.3	0.000
11.433	0.000	2.31	0.00	0.01	2.3	0.000
11.450	0.000	2.31	0.00	0.01	2.3	0.000
11.467	0.000	2.31	0.00	0.01	2.3	0.000
11.483	0.000	2.31	0.00	0.01	2.3	0.000
11.500	0.000	2.32	0.00	0.01	2.3	0.000
11.517	0.000	2.32	0.00	0.01	2.3	0.000
11.533	0.000	2.33	0.00	0.01	2.3	0.000

11.550	0.000	2.33	0.00	0.01	2.3	0.000
11.567	0.000	2.34	0.00	0.01	2.3	0.000
11.583	0.000	2.34	0.00	0.01	2.3	0.000
11.600	0.000	2.35	0.00	0.01	2.3	0.000
11.617	0.000	2.35	0.00	0.01	2.3	0.000
11.633	0.000	2.36	0.00	0.01	2.4	0.000
11.650	0.000	2.36	0.00	0.01	2.4	0.000
11.667	0.000	2.36	0.00	0.01	2.4	0.000
11.683	0.000	2.36	0.00	0.01	2.4	0.000
11.700	0.000	2.37	0.00	0.01	2.4	0.000
11.717	0.000	2.37	0.00	0.01	2.4	0.000
11.733	0.000	2.37	0.00	0.01	2.4	0.000
11.750	0.000	2.37	0.00	0.01	2.4	0.000
11.767	0.000	2.38	0.00	0.01	2.4	0.000
11.783	0.000	2.38	0.00	0.01	2.4	0.000
11.800	0.000	2.39	0.00	0.01	2.4	0.000
11.817	0.000	2.39	0.00	0.01	2.4	0.000
11.833	0.000	2.40	0.00	0.01	2.4	0.000
11.850	0.000	2.40	0.00	0.01	2.4	0.000
11.867	0.000	2.41	0.00	0.01	2.4	0.000
11.883	0.000	2.42	0.00	0.01	2.4	0.000
11.900	0.000	2.42	0.00	0.01	2.4	0.000
11.917	0.000	2.42	0.00	0.01	2.4	0.000
11.933	0.000	2.42	0.00	0.01	2.4	0.000
11.950	0.000	2.43	0.00	0.01	2.4	0.000
11.967	0.000	2.43	0.00	0.01	2.4	0.000
11.983	0.000	2.43	0.00	0.01	2.4	0.000
12.000	0.000	2.44	0.00	0.01	2.4	0.000
12.017	0.000	2.45	0.00	0.01	2.4	0.000
12.033	0.000	2.46	0.00	0.01	2.5	0.000
12.050	0.000	2.48	0.00	0.01	2.5	0.000
12.067	0.000	2.50	0.00	0.01	2.5	0.000
12.083	0.000	2.52	0.00	0.01	2.5	0.000
12.100	0.000	2.53	0.00	0.01	2.5	0.000
12.117	0.000	2.55	0.00	0.01	2.6	0.000
12.133	0.000	2.57	0.00	0.01	2.6	0.000
12.150	0.000	2.57	0.00	0.01	2.6	0.000
12.167	0.000	2.58	0.00	0.01	2.6	0.000
12.183	0.000	2.58	0.00	0.01	2.6	0.000
12.200	0.000	2.58	0.00	0.01	2.6	0.000
12.217	0.000	2.59	0.00	0.01	2.6	0.000
12.233	0.000	2.59	0.00	0.01	2.6	0.000
12.250	0.000	2.59	0.00	0.01	2.6	0.000
12.267	0.000	2.60	0.00	0.01	2.6	0.000
12.283	0.000	2.60	0.00	0.01	2.6	0.000
12.300	0.000	2.61	0.00	0.01	2.6	0.000
12.317	0.000	2.62	0.00	0.01	2.6	0.000
12.333	0.000	2.62	0.00	0.01	2.6	0.000
12.350	0.000	2.63	0.00	0.01	2.6	0.000
12.367	0.000	2.63	0.00	0.01	2.6	0.000
12.383	0.000	2.64	0.00	0.01	2.6	0.000
12.400	0.000	2.64	0.00	0.01	2.6	0.000
12.417	0.000	2.65	0.00	0.01	2.6	0.000
12.433	0.000	2.65	0.00	0.01	2.7	0.000
12.450	0.000	2.65	0.00	0.01	2.7	0.000
12.467	0.000	2.66	0.00	0.01	2.7	0.000
12.483	0.000	2.66	0.00	0.01	2.7	0.000
12.500	0.000	2.66	0.00	0.01	2.7	0.000
12.517	0.000	2.67	0.00	0.01	2.7	0.000
12.533	0.000	2.68	0.00	0.01	2.7	0.000
12.550	0.000	2.68	0.00	0.01	2.7	0.000
12.567	0.000	2.69	0.00	0.01	2.7	0.000
12.583	0.000	2.70	0.00	0.01	2.7	0.000
12.600	0.000	2.70	0.00	0.01	2.7	0.000
12.617	0.000	2.71	0.00	0.01	2.7	0.000
12.633	0.000	2.72	0.00	0.01	2.7	0.000
12.650	0.000	2.72	0.00	0.01	2.7	0.000
12.667	0.000	2.73	0.00	0.01	2.7	0.000
12.683	0.000	2.73	0.00	0.01	2.7	0.000
12.700	0.000	2.73	0.00	0.01	2.7	0.000
12.717	0.000	2.74	0.00	0.01	2.7	0.000
12.733	0.000	2.74	0.00	0.01	2.7	0.000
12.750	0.000	2.74	0.00	0.01	2.7	0.000
12.767	0.000	2.75	0.00	0.01	2.7	0.000
12.783	0.000	2.76	0.00	0.01	2.8	0.000
12.800	0.000	2.77	0.00	0.01	2.8	0.000
12.817	0.000	2.77	0.00	0.01	2.8	0.000
12.833	0.000	2.78	0.00	0.01	2.8	0.000
12.850	0.000	2.79	0.00	0.01	2.8	0.000

12.867	0.000	2.80	0.00	0.01	2.8	0.000
12.883	0.000	2.80	0.00	0.01	2.8	0.000
12.900	0.000	2.81	0.00	0.01	2.8	0.000
12.917	0.000	2.81	0.00	0.01	2.8	0.000
12.933	0.000	2.82	0.00	0.01	2.8	0.000
12.950	0.000	2.82	0.00	0.01	2.8	0.000
12.967	0.000	2.83	0.00	0.01	2.8	0.000
12.983	0.000	2.83	0.00	0.01	2.8	0.000
13.000	0.000	2.83	0.00	0.01	2.8	0.000
13.017	0.000	2.84	0.00	0.01	2.8	0.000
13.033	0.000	2.85	0.00	0.01	2.8	0.000
13.050	0.000	2.86	0.00	0.01	2.9	0.000
13.067	0.000	2.87	0.00	0.01	2.9	0.000
13.083	0.000	2.87	0.00	0.01	2.9	0.000
13.100	0.000	2.88	0.00	0.01	2.9	0.000
13.117	0.000	2.89	0.00	0.01	2.9	0.000
13.133	0.000	2.90	0.00	0.01	2.9	0.000
13.150	0.000	2.91	0.00	0.01	2.9	0.000
13.167	0.000	2.91	0.00	0.01	2.9	0.000
13.183	0.000	2.91	0.00	0.01	2.9	0.000
13.200	0.000	2.92	0.00	0.01	2.9	0.000
13.217	0.000	2.92	0.00	0.01	2.9	0.000
13.233	0.000	2.93	0.00	0.01	2.9	0.000
13.250	0.000	2.93	0.00	0.01	2.9	0.000
13.267	0.000	2.94	0.00	0.01	2.9	0.000
13.283	0.000	2.95	0.00	0.01	2.9	0.000
13.300	0.000	2.96	0.00	0.01	3.0	0.000
13.317	0.000	2.97	0.00	0.01	3.0	0.000
13.333	0.000	2.98	0.00	0.01	3.0	0.000
13.350	0.000	2.99	0.00	0.01	3.0	0.000
13.367	0.000	3.00	0.00	0.01	3.0	0.000
13.383	0.000	3.01	0.00	0.01	3.0	0.000
13.400	0.000	3.01	0.00	0.01	3.0	0.000
13.417	0.000	3.02	0.00	0.01	3.0	0.000
13.433	0.000	3.02	0.00	0.01	3.0	0.000
13.450	0.000	3.03	0.00	0.01	3.0	0.000
13.467	0.000	3.04	0.00	0.01	3.0	0.000
13.483	0.000	3.04	0.00	0.01	3.0	0.000
13.500	0.000	3.05	0.00	0.01	3.0	0.000
13.517	0.000	3.05	0.00	0.01	3.1	0.000
13.533	0.000	3.07	0.00	0.01	3.1	0.000
13.550	0.000	3.08	0.00	0.01	3.1	0.000
13.567	0.000	3.09	0.00	0.01	3.1	0.000
13.583	0.000	3.10	0.00	0.01	3.1	0.000
13.600	0.000	3.11	0.00	0.01	3.1	0.000
13.617	0.000	3.12	0.00	0.01	3.1	0.000
13.633	0.000	3.13	0.00	0.01	3.1	0.000
13.650	0.000	3.14	0.00	0.01	3.1	0.000
13.667	0.000	3.14	0.00	0.01	3.1	0.000
13.683	0.000	3.15	0.00	0.01	3.2	0.000
13.700	0.000	3.16	0.00	0.01	3.2	0.000
13.717	0.000	3.16	0.00	0.01	3.2	0.000
13.733	0.000	3.17	0.00	0.01	3.2	0.000
13.750	0.000	3.17	0.00	0.01	3.2	0.000
13.767	0.000	3.18	0.00	0.01	3.2	0.000
13.783	0.000	3.20	0.00	0.01	3.2	0.000
13.800	0.000	3.21	0.00	0.01	3.2	0.000
13.817	0.000	3.22	0.00	0.01	3.2	0.000
13.833	0.000	3.24	0.00	0.01	3.2	0.000
13.850	0.000	3.25	0.00	0.01	3.2	0.000
13.867	0.000	3.26	0.00	0.01	3.3	0.000
13.883	0.000	3.27	0.00	0.01	3.3	0.000
13.900	0.000	3.28	0.00	0.01	3.3	0.000
13.917	0.000	3.29	0.00	0.01	3.3	0.000
13.933	0.000	3.30	0.00	0.01	3.3	0.000
13.950	0.000	3.30	0.00	0.01	3.3	0.000
13.967	0.000	3.31	0.00	0.01	3.3	0.000
13.983	0.000	3.32	0.00	0.01	3.3	0.000
14.000	0.000	3.32	0.00	0.01	3.3	0.000
14.017	0.000	3.31	0.00	0.01	3.3	0.000
14.033	0.000	3.28	0.00	0.01	3.3	0.000
14.050	0.000	3.26	0.00	0.01	3.3	0.000
14.067	0.000	3.23	0.00	0.01	3.2	0.000
14.083	0.000	3.20	0.00	0.01	3.2	0.000
14.100	0.000	3.17	0.00	0.01	3.2	0.000
14.117	0.000	3.14	0.00	0.01	3.1	0.000
14.133	0.000	3.11	0.00	0.01	3.1	0.000
14.150	0.000	3.12	0.00	0.01	3.1	0.000
14.167	0.000	3.13	0.00	0.01	3.1	0.000

14.183	0.000	3.14	0.00	0.01	3.1	0.000
14.200	0.000	3.14	0.00	0.01	3.1	0.000
14.217	0.000	3.15	0.00	0.01	3.2	0.000
14.233	0.000	3.16	0.00	0.01	3.2	0.000
14.250	0.000	3.17	0.00	0.01	3.2	0.000
14.267	0.000	3.18	0.00	0.01	3.2	0.000
14.283	0.000	3.20	0.00	0.01	3.2	0.000
14.300	0.000	3.22	0.00	0.01	3.2	0.000
14.317	0.000	3.24	0.00	0.01	3.2	0.000
14.333	0.000	3.26	0.00	0.01	3.3	0.000
14.350	0.000	3.28	0.00	0.01	3.3	0.000
14.367	0.000	3.30	0.00	0.01	3.3	0.000
14.383	0.000	3.32	0.00	0.01	3.3	0.000
14.400	0.000	3.33	0.00	0.01	3.3	0.000
14.417	0.000	3.34	0.00	0.01	3.3	0.000
14.433	0.000	3.35	0.00	0.01	3.3	0.000
14.450	0.000	3.36	0.00	0.01	3.4	0.000
14.467	0.000	3.37	0.00	0.01	3.4	0.000
14.483	0.000	3.38	0.00	0.01	3.4	0.000
14.500	0.000	3.39	0.00	0.01	3.4	0.000
14.517	0.000	3.41	0.00	0.01	3.4	0.000
14.533	0.000	3.43	0.00	0.01	3.4	0.000
14.550	0.000	3.46	0.00	0.01	3.5	0.000
14.567	0.000	3.48	0.00	0.01	3.5	0.000
14.583	0.000	3.50	0.00	0.01	3.5	0.000
14.600	0.000	3.53	0.00	0.02	3.5	0.000
14.617	0.000	3.55	0.00	0.02	3.5	0.000
14.633	0.000	3.57	0.00	0.02	3.6	0.000
14.650	0.000	3.59	0.00	0.02	3.6	0.000
14.667	0.000	3.60	0.00	0.02	3.6	0.000
14.683	0.000	3.61	0.00	0.02	3.6	0.000
14.700	0.000	3.63	0.00	0.02	3.6	0.000
14.717	0.000	3.64	0.00	0.02	3.6	0.000
14.733	0.000	3.66	0.00	0.02	3.7	0.000
14.750	0.000	3.67	0.00	0.02	3.7	0.000
14.767	0.000	3.69	0.00	0.02	3.7	0.000
14.783	0.000	3.72	0.00	0.02	3.7	0.000
14.800	0.000	3.75	0.00	0.02	3.7	0.000
14.817	0.000	3.78	0.00	0.02	3.8	0.000
14.833	0.000	3.81	0.00	0.02	3.8	0.000
14.850	0.000	3.85	0.00	0.02	3.8	0.000
14.867	0.000	3.88	0.00	0.02	3.9	0.000
14.883	0.000	3.91	0.00	0.02	3.9	0.000
14.900	0.000	3.92	0.00	0.02	3.9	0.001
14.917	0.000	3.94	0.00	0.02	3.9	0.001
14.933	0.000	3.96	0.00	0.02	4.0	0.001
14.950	0.000	3.98	0.00	0.02	4.0	0.001
14.967	0.000	4.00	0.00	0.02	4.0	0.001
14.983	0.000	4.01	0.00	0.02	4.0	0.001
15.000	0.000	4.03	0.00	0.02	4.0	0.001
15.017	0.000	4.06	0.00	0.02	4.1	0.001
15.033	0.000	4.11	0.00	0.02	4.1	0.001
15.050	0.000	4.16	0.00	0.02	4.2	0.001
15.067	0.000	4.21	0.00	0.02	4.2	0.001
15.083	0.000	4.25	0.00	0.02	4.2	0.001
15.100	0.000	4.30	0.00	0.02	4.3	0.001
15.117	0.000	4.35	0.00	0.02	4.3	0.001
15.133	0.000	4.39	0.00	0.02	4.4	0.001
15.150	0.000	4.42	0.00	0.02	4.4	0.001
15.167	0.000	4.45	0.00	0.02	4.5	0.001
15.183	0.000	4.48	0.00	0.02	4.5	0.001
15.200	0.000	4.51	0.00	0.02	4.5	0.001
15.217	0.000	4.54	0.00	0.02	4.5	0.001
15.233	0.000	4.57	0.00	0.02	4.6	0.001
15.250	0.000	4.60	0.00	0.02	4.6	0.001
15.267	0.000	4.65	0.00	0.02	4.6	0.001
15.283	0.000	4.72	0.00	0.02	4.7	0.001
15.300	0.000	4.80	0.00	0.02	4.8	0.001
15.317	0.000	4.87	0.00	0.02	4.9	0.001
15.333	0.000	4.94	0.00	0.02	4.9	0.001
15.350	0.000	5.02	0.00	0.02	5.0	0.001
15.367	0.000	5.09	0.00	0.02	5.1	0.001
15.383	0.000	5.14	0.00	0.02	5.1	0.001
15.400	0.000	5.04	0.00	0.02	5.1	0.001
15.417	0.000	4.92	0.00	0.02	4.9	0.001
15.433	0.000	4.79	0.00	0.02	4.8	0.001
15.450	0.000	4.67	0.00	0.02	4.7	0.001
15.467	0.000	4.55	0.00	0.02	4.6	0.001
15.483	0.000	4.43	0.00	0.02	4.4	0.001

15.500	0.000	4.31	0.00	0.02	4.3	0.001
15.517	0.000	4.31	0.00	0.02	4.3	0.001
15.533	0.000	4.44	0.00	0.02	4.4	0.001
15.550	0.000	4.57	0.00	0.02	4.6	0.001
15.567	0.000	4.69	0.00	0.02	4.7	0.001
15.583	0.000	4.82	0.00	0.02	4.8	0.001
15.600	0.000	4.95	0.00	0.02	4.9	0.001
15.617	0.000	5.08	0.00	0.02	5.1	0.001
15.633	0.000	5.21	0.00	0.02	5.2	0.001
15.650	0.000	5.31	0.00	0.02	5.3	0.001
15.667	0.000	5.40	0.00	0.02	5.4	0.001
15.683	0.000	5.50	0.00	0.02	5.5	0.001
15.700	0.000	5.60	0.00	0.02	5.6	0.001
15.717	0.000	5.69	0.00	0.02	5.7	0.001
15.733	0.000	5.79	0.00	0.02	5.8	0.001
15.750	0.000	5.89	0.00	0.03	5.9	0.001
15.767	0.000	6.10	0.00	0.03	6.1	0.001
15.783	0.000	6.44	0.00	0.03	6.4	0.001
15.800	0.000	6.77	0.00	0.03	6.7	0.001
15.817	0.000	7.10	0.00	0.03	7.1	0.001
15.833	0.000	7.44	0.00	0.03	7.4	0.001
15.850	0.000	7.77	0.00	0.03	7.7	0.001
15.867	0.000	8.11	0.00	0.03	8.1	0.001
15.883	0.000	8.45	0.00	0.04	8.4	0.001
15.900	0.000	8.89	0.00	0.04	8.8	0.001
15.917	0.000	9.34	0.00	0.04	9.3	0.001
15.933	0.000	9.79	0.00	0.04	9.7	0.001
15.950	0.000	10.24	0.00	0.04	10.2	0.001
15.967	0.000	10.69	0.00	0.05	10.6	0.001
15.983	0.000	11.14	0.00	0.05	11.1	0.001
16.000	0.000	11.58	0.00	0.05	11.5	0.001
16.017	0.000	13.55	0.00	0.06	13.3	0.002
16.033	0.000	17.03	0.00	0.08	16.7	0.002
16.050	0.000	20.50	0.00	0.09	20.2	0.003
16.067	0.000	23.98	0.00	0.11	22.7	0.005
16.083	0.000	27.46	0.00	0.16	23.6	0.010
16.100	0.000	30.94	0.00	0.21	23.7	0.020
16.117	0.000	34.41	0.00	0.25	23.8	0.035
16.133	0.000	37.89	0.00	0.30	23.8	0.054
16.150	0.000	33.74	0.00	0.32	23.9	0.068
16.167	0.000	29.59	0.00	0.33	23.9	0.075
16.183	0.000	25.44	0.00	0.34	23.9	0.077
16.200	0.000	21.29	0.00	0.33	23.9	0.074
16.217	0.000	17.15	0.00	0.32	23.9	0.065
16.233	0.000	13.00	0.00	0.29	23.9	0.050
16.250	0.000	8.85	0.00	0.24	23.8	0.029
16.267	0.000	6.63	0.00	0.12	23.7	0.006
16.283	0.000	6.35	0.00	0.00	11.8	0.000
16.300	0.000	6.07	0.00	0.04	5.1	0.001
16.317	0.000	5.79	0.00	0.01	6.5	0.000
16.333	0.000	5.51	0.00	0.03	5.1	0.001
16.350	0.000	5.23	0.00	0.02	5.6	0.000
16.367	0.000	4.95	0.00	0.02	4.8	0.001
16.383	0.000	4.71	0.00	0.02	4.9	0.001
16.400	0.000	4.69	0.00	0.02	4.6	0.001
16.417	0.000	4.72	0.00	0.02	4.8	0.001
16.433	0.000	4.75	0.00	0.02	4.7	0.001
16.450	0.000	4.77	0.00	0.02	4.8	0.001
16.467	0.000	4.80	0.00	0.02	4.8	0.001
16.483	0.000	4.83	0.00	0.02	4.8	0.001
16.500	0.000	4.85	0.00	0.02	4.8	0.001
16.517	0.000	4.82	0.00	0.02	4.8	0.001
16.533	0.000	4.73	0.00	0.02	4.7	0.001
16.550	0.000	4.64	0.00	0.02	4.7	0.001
16.567	0.000	4.56	0.00	0.02	4.6	0.001
16.583	0.000	4.47	0.00	0.02	4.5	0.001
16.600	0.000	4.38	0.00	0.02	4.4	0.001
16.617	0.000	4.29	0.00	0.02	4.3	0.001
16.633	0.000	4.21	0.00	0.02	4.2	0.001
16.650	0.000	4.15	0.00	0.02	4.2	0.001
16.667	0.000	4.09	0.00	0.02	4.1	0.001
16.683	0.000	4.04	0.00	0.02	4.0	0.001
16.700	0.000	3.98	0.00	0.02	4.0	0.001
16.717	0.000	3.92	0.00	0.02	3.9	0.000
16.733	0.000	3.87	0.00	0.02	3.9	0.000
16.750	0.000	3.81	0.00	0.02	3.8	0.000
16.767	0.000	3.77	0.00	0.02	3.8	0.000
16.783	0.000	3.72	0.00	0.02	3.7	0.000
16.800	0.000	3.68	0.00	0.02	3.7	0.000



16.817	0.000	3.64	0.00	0.02	3.6	0.000
16.833	0.000	3.60	0.00	0.02	3.6	0.000
16.850	0.000	3.56	0.00	0.02	3.6	0.000
16.867	0.000	3.52	0.00	0.01	3.5	0.000
16.883	0.000	3.48	0.00	0.01	3.5	0.000
16.900	0.000	3.45	0.00	0.01	3.5	0.000
16.917	0.000	3.42	0.00	0.01	3.4	0.000
16.933	0.000	3.39	0.00	0.01	3.4	0.000
16.950	0.000	3.35	0.00	0.01	3.4	0.000
16.967	0.000	3.32	0.00	0.01	3.3	0.000
16.983	0.000	3.29	0.00	0.01	3.3	0.000
17.000	0.000	3.26	0.00	0.01	3.3	0.000
17.017	0.000	3.25	0.00	0.01	3.3	0.000
17.033	0.000	3.27	0.00	0.01	3.3	0.000
17.050	0.000	3.29	0.00	0.01	3.3	0.000
17.067	0.000	3.31	0.00	0.01	3.3	0.000
17.083	0.000	3.33	0.00	0.01	3.3	0.000
17.100	0.000	3.35	0.00	0.01	3.3	0.000
17.117	0.000	3.36	0.00	0.01	3.4	0.000
17.133	0.000	3.38	0.00	0.01	3.4	0.000
17.150	0.000	3.36	0.00	0.01	3.4	0.000
17.167	0.000	3.34	0.00	0.01	3.3	0.000
17.183	0.000	3.32	0.00	0.01	3.3	0.000
17.200	0.000	3.30	0.00	0.01	3.3	0.000
17.217	0.000	3.28	0.00	0.01	3.3	0.000
17.233	0.000	3.26	0.00	0.01	3.3	0.000
17.250	0.000	3.24	0.00	0.01	3.2	0.000
17.267	0.000	3.22	0.00	0.01	3.2	0.000
17.283	0.000	3.20	0.00	0.01	3.2	0.000
17.300	0.000	3.18	0.00	0.01	3.2	0.000
17.317	0.000	3.16	0.00	0.01	3.2	0.000
17.333	0.000	3.14	0.00	0.01	3.1	0.000
17.350	0.000	3.13	0.00	0.01	3.1	0.000
17.367	0.000	3.11	0.00	0.01	3.1	0.000
17.383	0.000	3.09	0.00	0.01	3.1	0.000
17.400	0.000	3.07	0.00	0.01	3.1	0.000
17.417	0.000	3.06	0.00	0.01	3.1	0.000
17.433	0.000	3.04	0.00	0.01	3.0	0.000
17.450	0.000	3.03	0.00	0.01	3.0	0.000
17.467	0.000	3.01	0.00	0.01	3.0	0.000
17.483	0.000	3.00	0.00	0.01	3.0	0.000
17.500	0.000	2.98	0.00	0.01	3.0	0.000
17.517	0.000	2.96	0.00	0.01	3.0	0.000
17.533	0.000	2.95	0.00	0.01	3.0	0.000
17.550	0.000	2.94	0.00	0.01	2.9	0.000
17.567	0.000	2.92	0.00	0.01	2.9	0.000
17.583	0.000	2.91	0.00	0.01	2.9	0.000
17.600	0.000	2.90	0.00	0.01	2.9	0.000
17.617	0.000	2.88	0.00	0.01	2.9	0.000
17.633	0.000	2.87	0.00	0.01	2.9	0.000
17.650	0.000	2.86	0.00	0.01	2.9	0.000
17.667	0.000	2.84	0.00	0.01	2.8	0.000
17.683	0.000	2.83	0.00	0.01	2.8	0.000
17.700	0.000	2.82	0.00	0.01	2.8	0.000
17.717	0.000	2.81	0.00	0.01	2.8	0.000
17.733	0.000	2.79	0.00	0.01	2.8	0.000
17.750	0.000	2.78	0.00	0.01	2.8	0.000
17.767	0.000	2.77	0.00	0.01	2.8	0.000
17.783	0.000	2.76	0.00	0.01	2.8	0.000
17.800	0.000	2.75	0.00	0.01	2.7	0.000
17.817	0.000	2.74	0.00	0.01	2.7	0.000
17.833	0.000	2.73	0.00	0.01	2.7	0.000
17.850	0.000	2.71	0.00	0.01	2.7	0.000
17.867	0.000	2.70	0.00	0.01	2.7	0.000
17.883	0.000	2.69	0.00	0.01	2.7	0.000
17.900	0.000	2.68	0.00	0.01	2.7	0.000
17.917	0.000	2.67	0.00	0.01	2.7	0.000
17.933	0.000	2.66	0.00	0.01	2.7	0.000
17.950	0.000	2.65	0.00	0.01	2.7	0.000
17.967	0.000	2.64	0.00	0.01	2.6	0.000
17.983	0.000	2.63	0.00	0.01	2.6	0.000
18.000	0.000	2.62	0.00	0.01	2.6	0.000
18.017	0.000	2.61	0.00	0.01	2.6	0.000
18.033	0.000	2.59	0.00	0.01	2.6	0.000
18.050	0.000	2.56	0.00	0.01	2.6	0.000
18.067	0.000	2.54	0.00	0.01	2.5	0.000
18.083	0.000	2.52	0.00	0.01	2.5	0.000
18.100	0.000	2.50	0.00	0.01	2.5	0.000
18.117	0.000	2.48	0.00	0.01	2.5	0.000

18.133	0.000	2.46	0.00	0.01	2.5	0.000
18.150	0.000	2.45	0.00	0.01	2.5	0.000
18.167	0.000	2.44	0.00	0.01	2.4	0.000
18.183	0.000	2.43	0.00	0.01	2.4	0.000
18.200	0.000	2.42	0.00	0.01	2.4	0.000
18.217	0.000	2.42	0.00	0.01	2.4	0.000
18.233	0.000	2.41	0.00	0.01	2.4	0.000
18.250	0.000	2.40	0.00	0.01	2.4	0.000
18.267	0.000	2.39	0.00	0.01	2.4	0.000
18.283	0.000	2.38	0.00	0.01	2.4	0.000
18.300	0.000	2.38	0.00	0.01	2.4	0.000
18.317	0.000	2.37	0.00	0.01	2.4	0.000
18.333	0.000	2.36	0.00	0.01	2.4	0.000
18.350	0.000	2.35	0.00	0.01	2.4	0.000
18.367	0.000	2.34	0.00	0.01	2.3	0.000
18.383	0.000	2.34	0.00	0.01	2.3	0.000
18.400	0.000	2.33	0.00	0.01	2.3	0.000
18.417	0.000	2.32	0.00	0.01	2.3	0.000
18.433	0.000	2.31	0.00	0.01	2.3	0.000
18.450	0.000	2.31	0.00	0.01	2.3	0.000
18.467	0.000	2.30	0.00	0.01	2.3	0.000
18.483	0.000	2.29	0.00	0.01	2.3	0.000
18.500	0.000	2.29	0.00	0.01	2.3	0.000
18.517	0.000	2.28	0.00	0.01	2.3	0.000
18.533	0.000	2.27	0.00	0.01	2.3	0.000
18.550	0.000	2.27	0.00	0.01	2.3	0.000
18.567	0.000	2.26	0.00	0.01	2.3	0.000
18.583	0.000	2.25	0.00	0.01	2.3	0.000
18.600	0.000	2.25	0.00	0.01	2.2	0.000
18.617	0.000	2.24	0.00	0.01	2.2	0.000
18.633	0.000	2.23	0.00	0.01	2.2	0.000
18.650	0.000	2.23	0.00	0.01	2.2	0.000
18.667	0.000	2.22	0.00	0.01	2.2	0.000
18.683	0.000	2.21	0.00	0.01	2.2	0.000
18.700	0.000	2.21	0.00	0.01	2.2	0.000
18.717	0.000	2.20	0.00	0.01	2.2	0.000
18.733	0.000	2.20	0.00	0.01	2.2	0.000
18.750	0.000	2.19	0.00	0.01	2.2	0.000
18.767	0.000	2.18	0.00	0.01	2.2	0.000
18.783	0.000	2.18	0.00	0.01	2.2	0.000
18.800	0.000	2.17	0.00	0.01	2.2	0.000
18.817	0.000	2.17	0.00	0.01	2.2	0.000
18.833	0.000	2.16	0.00	0.01	2.2	0.000
18.850	0.000	2.15	0.00	0.01	2.2	0.000
18.867	0.000	2.15	0.00	0.01	2.1	0.000
18.883	0.000	2.14	0.00	0.01	2.1	0.000
18.900	0.000	2.14	0.00	0.01	2.1	0.000
18.917	0.000	2.13	0.00	0.01	2.1	0.000
18.933	0.000	2.13	0.00	0.01	2.1	0.000
18.950	0.000	2.12	0.00	0.01	2.1	0.000
18.967	0.000	2.12	0.00	0.01	2.1	0.000
18.983	0.000	2.11	0.00	0.01	2.1	0.000
19.000	0.000	2.10	0.00	0.01	2.1	0.000
19.017	0.000	2.10	0.00	0.01	2.1	0.000
19.033	0.000	2.09	0.00	0.01	2.1	0.000
19.050	0.000	2.09	0.00	0.01	2.1	0.000
19.067	0.000	2.08	0.00	0.01	2.1	0.000
19.083	0.000	2.08	0.00	0.01	2.1	0.000
19.100	0.000	2.07	0.00	0.01	2.1	0.000
19.117	0.000	2.07	0.00	0.01	2.1	0.000
19.133	0.000	2.06	0.00	0.01	2.1	0.000
19.150	0.000	2.06	0.00	0.01	2.1	0.000
19.167	0.000	2.05	0.00	0.01	2.1	0.000
19.183	0.000	2.05	0.00	0.01	2.0	0.000
19.200	0.000	2.04	0.00	0.01	2.0	0.000
19.217	0.000	2.04	0.00	0.01	2.0	0.000
19.233	0.000	2.03	0.00	0.01	2.0	0.000
19.250	0.000	2.03	0.00	0.01	2.0	0.000
19.267	0.000	2.02	0.00	0.01	2.0	0.000
19.283	0.000	2.02	0.00	0.01	2.0	0.000
19.300	0.000	2.02	0.00	0.01	2.0	0.000
19.317	0.000	2.01	0.00	0.01	2.0	0.000
19.333	0.000	2.01	0.00	0.01	2.0	0.000
19.350	0.000	2.00	0.00	0.01	2.0	0.000
19.367	0.000	2.00	0.00	0.01	2.0	0.000
19.383	0.000	1.99	0.00	0.01	2.0	0.000
19.400	0.000	1.99	0.00	0.01	2.0	0.000
19.417	0.000	1.98	0.00	0.01	2.0	0.000
19.433	0.000	1.98	0.00	0.01	2.0	0.000

19.450	0.000	1.98	0.00	0.01	2.0	0.000
19.467	0.000	1.97	0.00	0.01	2.0	0.000
19.483	0.000	1.97	0.00	0.01	2.0	0.000
19.500	0.000	1.96	0.00	0.01	2.0	0.000
19.517	0.000	1.96	0.00	0.01	2.0	0.000
19.533	0.000	1.95	0.00	0.01	2.0	0.000
19.550	0.000	1.95	0.00	0.01	2.0	0.000
19.567	0.000	1.95	0.00	0.01	1.9	0.000
19.583	0.000	1.94	0.00	0.01	1.9	0.000
19.600	0.000	1.94	0.00	0.01	1.9	0.000
19.617	0.000	1.93	0.00	0.01	1.9	0.000
19.633	0.000	1.93	0.00	0.01	1.9	0.000
19.650	0.000	1.93	0.00	0.01	1.9	0.000
19.667	0.000	1.92	0.00	0.01	1.9	0.000
19.683	0.000	1.92	0.00	0.01	1.9	0.000
19.700	0.000	1.91	0.00	0.01	1.9	0.000
19.717	0.000	1.91	0.00	0.01	1.9	0.000
19.733	0.000	1.91	0.00	0.01	1.9	0.000
19.750	0.000	1.90	0.00	0.01	1.9	0.000
19.767	0.000	1.90	0.00	0.01	1.9	0.000
19.783	0.000	1.90	0.00	0.01	1.9	0.000
19.800	0.000	1.89	0.00	0.01	1.9	0.000
19.817	0.000	1.89	0.00	0.01	1.9	0.000
19.833	0.000	1.88	0.00	0.01	1.9	0.000
19.850	0.000	1.88	0.00	0.01	1.9	0.000
19.867	0.000	1.88	0.00	0.01	1.9	0.000
19.883	0.000	1.87	0.00	0.01	1.9	0.000
19.900	0.000	1.87	0.00	0.01	1.9	0.000
19.917	0.000	1.87	0.00	0.01	1.9	0.000
19.933	0.000	1.86	0.00	0.01	1.9	0.000
19.950	0.000	1.86	0.00	0.01	1.9	0.000
19.967	0.000	1.86	0.00	0.01	1.9	0.000
19.983	0.000	1.85	0.00	0.01	1.9	0.000
20.000	0.000	1.85	0.00	0.01	1.8	0.000
20.017	0.000	1.85	0.00	0.01	1.8	0.000
20.033	0.000	1.84	0.00	0.01	1.8	0.000
20.050	0.000	1.84	0.00	0.01	1.8	0.000
20.067	0.000	1.84	0.00	0.01	1.8	0.000
20.083	0.000	1.83	0.00	0.01	1.8	0.000
20.100	0.000	1.83	0.00	0.01	1.8	0.000
20.117	0.000	1.82	0.00	0.01	1.8	0.000
20.133	0.000	1.82	0.00	0.01	1.8	0.000
20.150	0.000	1.82	0.00	0.01	1.8	0.000
20.167	0.000	1.82	0.00	0.01	1.8	0.000
20.183	0.000	1.81	0.00	0.01	1.8	0.000
20.200	0.000	1.81	0.00	0.01	1.8	0.000
20.217	0.000	1.81	0.00	0.01	1.8	0.000
20.233	0.000	1.80	0.00	0.01	1.8	0.000
20.250	0.000	1.80	0.00	0.01	1.8	0.000
20.267	0.000	1.80	0.00	0.01	1.8	0.000
20.283	0.000	1.79	0.00	0.01	1.8	0.000
20.300	0.000	1.79	0.00	0.01	1.8	0.000
20.317	0.000	1.79	0.00	0.01	1.8	0.000
20.333	0.000	1.78	0.00	0.01	1.8	0.000
20.350	0.000	1.78	0.00	0.01	1.8	0.000
20.367	0.000	1.78	0.00	0.01	1.8	0.000
20.383	0.000	1.77	0.00	0.01	1.8	0.000
20.400	0.000	1.77	0.00	0.01	1.8	0.000
20.417	0.000	1.77	0.00	0.01	1.8	0.000
20.433	0.000	1.77	0.00	0.01	1.8	0.000
20.450	0.000	1.76	0.00	0.01	1.8	0.000
20.467	0.000	1.76	0.00	0.01	1.8	0.000
20.483	0.000	1.76	0.00	0.01	1.8	0.000
20.500	0.000	1.75	0.00	0.01	1.8	0.000
20.517	0.000	1.75	0.00	0.01	1.8	0.000
20.533	0.000	1.75	0.00	0.01	1.7	0.000
20.550	0.000	1.75	0.00	0.01	1.7	0.000
20.567	0.000	1.74	0.00	0.01	1.7	0.000
20.583	0.000	1.74	0.00	0.01	1.7	0.000
20.600	0.000	1.74	0.00	0.01	1.7	0.000
20.617	0.000	1.73	0.00	0.01	1.7	0.000
20.633	0.000	1.73	0.00	0.01	1.7	0.000
20.650	0.000	1.73	0.00	0.01	1.7	0.000
20.667	0.000	1.73	0.00	0.01	1.7	0.000
20.683	0.000	1.72	0.00	0.01	1.7	0.000
20.700	0.000	1.72	0.00	0.01	1.7	0.000
20.717	0.000	1.72	0.00	0.01	1.7	0.000
20.733	0.000	1.71	0.00	0.01	1.7	0.000
20.750	0.000	1.71	0.00	0.01	1.7	0.000

20.767	0.000	1.71	0.00	0.01	1.7	0.000
20.783	0.000	1.71	0.00	0.01	1.7	0.000
20.800	0.000	1.70	0.00	0.01	1.7	0.000
20.817	0.000	1.70	0.00	0.01	1.7	0.000
20.833	0.000	1.70	0.00	0.01	1.7	0.000
20.850	0.000	1.70	0.00	0.01	1.7	0.000
20.867	0.000	1.69	0.00	0.01	1.7	0.000
20.883	0.000	1.69	0.00	0.01	1.7	0.000
20.900	0.000	1.69	0.00	0.01	1.7	0.000
20.917	0.000	1.69	0.00	0.01	1.7	0.000
20.933	0.000	1.68	0.00	0.01	1.7	0.000
20.950	0.000	1.68	0.00	0.01	1.7	0.000
20.967	0.000	1.68	0.00	0.01	1.7	0.000
20.983	0.000	1.68	0.00	0.01	1.7	0.000
21.000	0.000	1.67	0.00	0.01	1.7	0.000
21.017	0.000	1.67	0.00	0.01	1.7	0.000
21.033	0.000	1.67	0.00	0.01	1.7	0.000
21.050	0.000	1.67	0.00	0.01	1.7	0.000
21.067	0.000	1.66	0.00	0.01	1.7	0.000
21.083	0.000	1.66	0.00	0.01	1.7	0.000
21.100	0.000	1.66	0.00	0.01	1.7	0.000
21.117	0.000	1.66	0.00	0.01	1.7	0.000
21.133	0.000	1.65	0.00	0.01	1.7	0.000
21.150	0.000	1.65	0.00	0.01	1.7	0.000
21.167	0.000	1.65	0.00	0.01	1.6	0.000
21.183	0.000	1.65	0.00	0.01	1.6	0.000
21.200	0.000	1.64	0.00	0.01	1.6	0.000
21.217	0.000	1.64	0.00	0.01	1.6	0.000
21.233	0.000	1.64	0.00	0.01	1.6	0.000
21.250	0.000	1.64	0.00	0.01	1.6	0.000
21.267	0.000	1.63	0.00	0.01	1.6	0.000
21.283	0.000	1.63	0.00	0.01	1.6	0.000
21.300	0.000	1.63	0.00	0.01	1.6	0.000
21.317	0.000	1.63	0.00	0.01	1.6	0.000
21.333	0.000	1.63	0.00	0.01	1.6	0.000
21.350	0.000	1.62	0.00	0.01	1.6	0.000
21.367	0.000	1.62	0.00	0.01	1.6	0.000
21.383	0.000	1.62	0.00	0.01	1.6	0.000
21.400	0.000	1.62	0.00	0.01	1.6	0.000
21.417	0.000	1.61	0.00	0.01	1.6	0.000
21.433	0.000	1.61	0.00	0.01	1.6	0.000
21.450	0.000	1.61	0.00	0.01	1.6	0.000
21.467	0.000	1.61	0.00	0.01	1.6	0.000
21.483	0.000	1.61	0.00	0.01	1.6	0.000
21.500	0.000	1.60	0.00	0.01	1.6	0.000
21.517	0.000	1.60	0.00	0.01	1.6	0.000
21.533	0.000	1.60	0.00	0.01	1.6	0.000
21.550	0.000	1.60	0.00	0.01	1.6	0.000
21.567	0.000	1.60	0.00	0.01	1.6	0.000
21.583	0.000	1.59	0.00	0.01	1.6	0.000
21.600	0.000	1.59	0.00	0.01	1.6	0.000
21.617	0.000	1.59	0.00	0.01	1.6	0.000
21.633	0.000	1.59	0.00	0.01	1.6	0.000
21.650	0.000	1.58	0.00	0.01	1.6	0.000
21.667	0.000	1.58	0.00	0.01	1.6	0.000
21.683	0.000	1.58	0.00	0.01	1.6	0.000
21.700	0.000	1.58	0.00	0.01	1.6	0.000
21.717	0.000	1.58	0.00	0.01	1.6	0.000
21.733	0.000	1.57	0.00	0.01	1.6	0.000
21.750	0.000	1.57	0.00	0.01	1.6	0.000
21.767	0.000	1.57	0.00	0.01	1.6	0.000
21.783	0.000	1.57	0.00	0.01	1.6	0.000
21.800	0.000	1.57	0.00	0.01	1.6	0.000
21.817	0.000	1.56	0.00	0.01	1.6	0.000
21.833	0.000	1.56	0.00	0.01	1.6	0.000
21.850	0.000	1.56	0.00	0.01	1.6	0.000
21.867	0.000	1.56	0.00	0.01	1.6	0.000
21.883	0.000	1.56	0.00	0.01	1.6	0.000
21.900	0.000	1.55	0.00	0.01	1.6	0.000
21.917	0.000	1.55	0.00	0.01	1.6	0.000
21.933	0.000	1.55	0.00	0.01	1.6	0.000
21.950	0.000	1.55	0.00	0.01	1.5	0.000
21.967	0.000	1.55	0.00	0.01	1.5	0.000
21.983	0.000	1.54	0.00	0.01	1.5	0.000
22.000	0.000	1.54	0.00	0.01	1.5	0.000
22.017	0.000	1.54	0.00	0.01	1.5	0.000
22.033	0.000	1.54	0.00	0.01	1.5	0.000
22.050	0.000	1.54	0.00	0.01	1.5	0.000
22.067	0.000	1.54	0.00	0.01	1.5	0.000

22.083	0.000	1.53	0.00	0.01	1.5	0.000
22.100	0.000	1.53	0.00	0.01	1.5	0.000
22.117	0.000	1.53	0.00	0.01	1.5	0.000
22.133	0.000	1.53	0.00	0.01	1.5	0.000
22.150	0.000	1.53	0.00	0.01	1.5	0.000
22.167	0.000	1.52	0.00	0.01	1.5	0.000
22.183	0.000	1.52	0.00	0.01	1.5	0.000
22.200	0.000	1.52	0.00	0.01	1.5	0.000
22.216	0.000	1.52	0.00	0.01	1.5	0.000
22.233	0.000	1.52	0.00	0.01	1.5	0.000
22.250	0.000	1.52	0.00	0.01	1.5	0.000
22.266	0.000	1.51	0.00	0.01	1.5	0.000
22.283	0.000	1.51	0.00	0.01	1.5	0.000
22.300	0.000	1.51	0.00	0.01	1.5	0.000
22.316	0.000	1.51	0.00	0.01	1.5	0.000
22.333	0.000	1.51	0.00	0.01	1.5	0.000
22.350	0.000	1.50	0.00	0.01	1.5	0.000
22.366	0.000	1.50	0.00	0.01	1.5	0.000
22.383	0.000	1.50	0.00	0.01	1.5	0.000
22.400	0.000	1.50	0.00	0.01	1.5	0.000
22.416	0.000	1.50	0.00	0.01	1.5	0.000
22.433	0.000	1.50	0.00	0.01	1.5	0.000
22.450	0.000	1.49	0.00	0.01	1.5	0.000
22.466	0.000	1.49	0.00	0.01	1.5	0.000
22.483	0.000	1.49	0.00	0.01	1.5	0.000
22.500	0.000	1.49	0.00	0.01	1.5	0.000
22.516	0.000	1.49	0.00	0.01	1.5	0.000
22.533	0.000	1.49	0.00	0.01	1.5	0.000
22.550	0.000	1.48	0.00	0.01	1.5	0.000
22.566	0.000	1.48	0.00	0.01	1.5	0.000
22.583	0.000	1.48	0.00	0.01	1.5	0.000
22.600	0.000	1.48	0.00	0.01	1.5	0.000
22.616	0.000	1.48	0.00	0.01	1.5	0.000
22.633	0.000	1.48	0.00	0.01	1.5	0.000
22.650	0.000	1.47	0.00	0.01	1.5	0.000
22.666	0.000	1.47	0.00	0.01	1.5	0.000
22.683	0.000	1.47	0.00	0.01	1.5	0.000
22.700	0.000	1.47	0.00	0.01	1.5	0.000
22.716	0.000	1.47	0.00	0.01	1.5	0.000
22.733	0.000	1.47	0.00	0.01	1.5	0.000
22.750	0.000	1.46	0.00	0.01	1.5	0.000
22.766	0.000	1.46	0.00	0.01	1.5	0.000
22.783	0.000	1.46	0.00	0.01	1.5	0.000
22.800	0.000	1.46	0.00	0.01	1.5	0.000
22.816	0.000	1.46	0.00	0.01	1.5	0.000
22.833	0.000	1.46	0.00	0.01	1.5	0.000
22.850	0.000	1.45	0.00	0.01	1.5	0.000
22.866	0.000	1.45	0.00	0.01	1.5	0.000
22.883	0.000	1.45	0.00	0.01	1.5	0.000
22.900	0.000	1.45	0.00	0.01	1.5	0.000
22.916	0.000	1.45	0.00	0.01	1.4	0.000
22.933	0.000	1.45	0.00	0.01	1.4	0.000
22.950	0.000	1.45	0.00	0.01	1.4	0.000
22.966	0.000	1.44	0.00	0.01	1.4	0.000
22.983	0.000	1.44	0.00	0.01	1.4	0.000
23.000	0.000	1.44	0.00	0.01	1.4	0.000
23.016	0.000	1.44	0.00	0.01	1.4	0.000
23.033	0.000	1.44	0.00	0.01	1.4	0.000
23.050	0.000	1.44	0.00	0.01	1.4	0.000
23.066	0.000	1.43	0.00	0.01	1.4	0.000
23.083	0.000	1.43	0.00	0.01	1.4	0.000
23.100	0.000	1.43	0.00	0.01	1.4	0.000
23.116	0.000	1.43	0.00	0.01	1.4	0.000
23.133	0.000	1.43	0.00	0.01	1.4	0.000
23.150	0.000	1.43	0.00	0.01	1.4	0.000
23.166	0.000	1.43	0.00	0.01	1.4	0.000
23.183	0.000	1.42	0.00	0.01	1.4	0.000
23.200	0.000	1.42	0.00	0.01	1.4	0.000
23.216	0.000	1.42	0.00	0.01	1.4	0.000
23.233	0.000	1.42	0.00	0.01	1.4	0.000
23.250	0.000	1.42	0.00	0.01	1.4	0.000
23.266	0.000	1.42	0.00	0.01	1.4	0.000
23.283	0.000	1.42	0.00	0.01	1.4	0.000
23.300	0.000	1.41	0.00	0.01	1.4	0.000
23.316	0.000	1.41	0.00	0.01	1.4	0.000
23.333	0.000	1.41	0.00	0.01	1.4	0.000
23.350	0.000	1.41	0.00	0.01	1.4	0.000
23.366	0.000	1.41	0.00	0.01	1.4	0.000
23.383	0.000	1.41	0.00	0.01	1.4	0.000

23.400	0.000	1.41	0.00	0.01	1.4	0.000
23.416	0.000	1.40	0.00	0.01	1.4	0.000
23.433	0.000	1.40	0.00	0.01	1.4	0.000
23.450	0.000	1.40	0.00	0.01	1.4	0.000
23.466	0.000	1.40	0.00	0.01	1.4	0.000
23.483	0.000	1.40	0.00	0.01	1.4	0.000
23.500	0.000	1.40	0.00	0.01	1.4	0.000
23.516	0.000	1.40	0.00	0.01	1.4	0.000
23.533	0.000	1.39	0.00	0.01	1.4	0.000
23.550	0.000	1.39	0.00	0.01	1.4	0.000
23.566	0.000	1.39	0.00	0.01	1.4	0.000
23.583	0.000	1.39	0.00	0.01	1.4	0.000
23.600	0.000	1.39	0.00	0.01	1.4	0.000
23.616	0.000	1.39	0.00	0.01	1.4	0.000
23.633	0.000	1.39	0.00	0.01	1.4	0.000
23.650	0.000	1.39	0.00	0.01	1.4	0.000
23.666	0.000	1.38	0.00	0.01	1.4	0.000
23.683	0.000	1.38	0.00	0.01	1.4	0.000
23.700	0.000	1.38	0.00	0.01	1.4	0.000
23.716	0.000	1.38	0.00	0.01	1.4	0.000
23.733	0.000	1.38	0.00	0.01	1.4	0.000
23.750	0.000	1.38	0.00	0.01	1.4	0.000
23.766	0.000	1.38	0.00	0.01	1.4	0.000
23.783	0.000	1.37	0.00	0.01	1.4	0.000
23.800	0.000	1.37	0.00	0.01	1.4	0.000
23.816	0.000	1.37	0.00	0.01	1.4	0.000
23.833	0.000	1.37	0.00	0.01	1.4	0.000
23.850	0.000	1.37	0.00	0.01	1.4	0.000
23.866	0.000	1.37	0.00	0.01	1.4	0.000
23.883	0.000	1.37	0.00	0.01	1.4	0.000
23.900	0.000	1.37	0.00	0.01	1.4	0.000
23.916	0.000	1.36	0.00	0.01	1.4	0.000
23.933	0.000	1.36	0.00	0.01	1.4	0.000
23.950	0.000	1.36	0.00	0.01	1.4	0.000
23.966	0.000	1.36	0.00	0.01	1.4	0.000
23.983	0.000	1.36	0.00	0.01	1.4	0.000
24.000	0.000	1.36	0.00	0.01	1.4	0.000
24.016	0.000	1.27	0.00	0.01	1.3	0.000
24.033	0.000	1.09	0.00	0.00	1.1	0.000
24.050	0.000	0.91	0.00	0.00	0.9	0.000
24.066	0.000	0.72	0.00	0.00	0.7	0.000
24.083	0.000	0.54	0.00	0.00	0.6	0.000
24.100	0.000	0.36	0.00	0.00	0.4	0.000
24.116	0.000	0.18	0.00	0.00	0.2	0.000
24.133	0.000	0.00	0.00	0.00	0.1	0.000
24.150	0.000	0.00	0.00	0.00	0.0	0.000
24.166	0.000	0.00	0.00	0.00	0.0	0.000
24.183	0.000	0.00	0.00	0.00	0.0	0.000
24.200	0.000	0.00	0.00	0.00	0.0	0.000
24.216	0.000	0.00	0.00	0.00	0.0	0.000
24.233	0.000	0.00	0.00	0.00	0.0	0.000
24.250	0.000	0.00	0.00	0.00	0.0	0.000
24.266	0.000	0.00	0.00	0.00	0.0	0.000
24.283	0.000	0.00	0.00	0.00	0.0	0.000
24.300	0.000	0.00	0.00	0.00	0.0	0.000
24.316	0.000	0.00	0.00	0.00	0.0	0.000
24.333	0.000	0.00	0.00	0.00	0.0	0.000
24.350	0.000	0.00	0.00	0.00	0.0	0.000
24.366	0.000	0.00	0.00	0.00	0.0	0.000
24.383	0.000	0.00	0.00	0.00	0.0	0.000
24.400	0.000	0.00	0.00	0.00	0.0	0.000
24.416	0.000	0.00	0.00	0.00	0.0	0.000
24.433	0.000	0.00	0.00	0.00	0.0	0.000
24.450	0.000	0.00	0.00	0.00	0.0	0.000
24.466	0.000	0.00	0.00	0.00	0.0	0.000
24.483	0.000	0.00	0.00	0.00	0.0	0.000
24.500	0.000	0.00	0.00	0.00	0.0	0.000
24.516	0.000	0.00	0.00	0.00	0.0	0.000
24.533	0.000	0.00	0.00	0.00	0.0	0.000
24.550	0.000	0.00	0.00	0.00	0.0	0.000
24.566	0.000	0.00	0.00	0.00	0.0	0.000
24.583	0.000	0.00	0.00	0.00	0.0	0.000
24.600	0.000	0.00	0.00	0.00	0.0	0.000
24.616	0.000	0.00	0.00	0.00	0.0	0.000
24.633	0.000	0.00	0.00	0.00	0.0	0.000
24.650	0.000	0.00	0.00	0.00	0.0	0.000
24.666	0.000	0.00	0.00	0.00	0.0	0.000
24.683	0.000	0.00	0.00	0.00	0.0	0.000
24.700	0.000	0.00	0.00	0.00	0.0	0.000

24.716	0.000	0.00	0.00	0.00	0.0	0.000
24.733	0.000	0.00	0.00	0.00	0.0	0.000
24.750	0.000	0.00	0.00	0.00	0.0	0.000
24.766	0.000	0.00	0.00	0.00	0.0	0.000
24.783	0.000	0.00	0.00	0.00	0.0	0.000
24.800	0.000	0.00	0.00	0.00	0.0	0.000
24.816	0.000	0.00	0.00	0.00	0.0	0.000
24.833	0.000	0.00	0.00	0.00	0.0	0.000
24.850	0.000	0.00	0.00	0.00	0.0	0.000
24.866	0.000	0.00	0.00	0.00	0.0	0.000
24.883	0.000	0.00	0.00	0.00	0.0	0.000
24.900	0.000	0.00	0.00	0.00	0.0	0.000
24.916	0.000	0.00	0.00	0.00	0.0	0.000
24.933	0.000	0.00	0.00	0.00	0.0	0.000
24.950	0.000	0.00	0.00	0.00	0.0	0.000
24.966	0.000	0.00	0.00	0.00	0.0	0.000
24.983	0.000	0.00	0.00	0.00	0.0	0.000
25.000	0.000	0.00	0.00	0.00	0.0	0.000
25.016	0.000	0.00	0.00	0.00	0.0	0.000
25.033	0.000	0.00	0.00	0.00	0.0	0.000
25.050	0.000	0.00	0.00	0.00	0.0	0.000
25.066	0.000	0.00	0.00	0.00	0.0	0.000
25.083	0.000	0.00	0.00	0.00	0.0	0.000
25.100	0.000	0.00	0.00	0.00	0.0	0.000
25.116	0.000	0.00	0.00	0.00	0.0	0.000
25.133	0.000	0.00	0.00	0.00	0.0	0.000
25.150	0.000	0.00	0.00	0.00	0.0	0.000
25.166	0.000	0.00	0.00	0.00	0.0	0.000
25.183	0.000	0.00	0.00	0.00	0.0	0.000
25.200	0.000	0.00	0.00	0.00	0.0	0.000
25.216	0.000	0.00	0.00	0.00	0.0	0.000
25.233	0.000	0.00	0.00	0.00	0.0	0.000
25.250	0.000	0.00	0.00	0.00	0.0	0.000
25.266	0.000	0.00	0.00	0.00	0.0	0.000
25.283	0.000	0.00	0.00	0.00	0.0	0.000
25.300	0.000	0.00	0.00	0.00	0.0	0.000
25.316	0.000	0.00	0.00	0.00	0.0	0.000
25.333	0.000	0.00	0.00	0.00	0.0	0.000
25.350	0.000	0.00	0.00	0.00	0.0	0.000
25.366	0.000	0.00	0.00	0.00	0.0	0.000
25.383	0.000	0.00	0.00	0.00	0.0	0.000
25.400	0.000	0.00	0.00	0.00	0.0	0.000
25.416	0.000	0.00	0.00	0.00	0.0	0.000
25.433	0.000	0.00	0.00	0.00	0.0	0.000
25.450	0.000	0.00	0.00	0.00	0.0	0.000
25.466	0.000	0.00	0.00	0.00	0.0	0.000
25.483	0.000	0.00	0.00	0.00	0.0	0.000
25.500	0.000	0.00	0.00	0.00	0.0	0.000
25.516	0.000	0.00	0.00	0.00	0.0	0.000
25.533	0.000	0.00	0.00	0.00	0.0	0.000
25.550	0.000	0.00	0.00	0.00	0.0	0.000
25.566	0.000	0.00	0.00	0.00	0.0	0.000
25.583	0.000	0.00	0.00	0.00	0.0	0.000
25.600	0.000	0.00	0.00	0.00	0.0	0.000
25.616	0.000	0.00	0.00	0.00	0.0	0.000
25.633	0.000	0.00	0.00	0.00	0.0	0.000
25.650	0.000	0.00	0.00	0.00	0.0	0.000
25.666	0.000	0.00	0.00	0.00	0.0	0.000
25.683	0.000	0.00	0.00	0.00	0.0	0.000
25.700	0.000	0.00	0.00	0.00	0.0	0.000
25.716	0.000	0.00	0.00	0.00	0.0	0.000
25.733	0.000	0.00	0.00	0.00	0.0	0.000
25.750	0.000	0.00	0.00	0.00	0.0	0.000
25.766	0.000	0.00	0.00	0.00	0.0	0.000
25.783	0.000	0.00	0.00	0.00	0.0	0.000
25.800	0.000	0.00	0.00	0.00	0.0	0.000
25.816	0.000	0.00	0.00	0.00	0.0	0.000
25.833	0.000	0.00	0.00	0.00	0.0	0.000
25.850	0.000	0.00	0.00	0.00	0.0	0.000
25.866	0.000	0.00	0.00	0.00	0.0	0.000
25.883	0.000	0.00	0.00	0.00	0.0	0.000
25.900	0.000	0.00	0.00	0.00	0.0	0.000
25.916	0.000	0.00	0.00	0.00	0.0	0.000
25.933	0.000	0.00	0.00	0.00	0.0	0.000
25.950	0.000	0.00	0.00	0.00	0.0	0.000
25.966	0.000	0.00	0.00	0.00	0.0	0.000
25.983	0.000	0.00	0.00	0.00	0.0	0.000
26.000	0.000	0.00	0.00	0.00	0.0	0.000
26.016	0.000	0.00	0.00	0.00	0.0	0.000

26.033	0.000	0.00	0.00	0.00	0.0	0.000
26.050	0.000	0.00	0.00	0.00	0.0	0.000
26.066	0.000	0.00	0.00	0.00	0.0	0.000
26.083	0.000	0.00	0.00	0.00	0.0	0.000
26.100	0.000	0.00	0.00	0.00	0.0	0.000
26.116	0.000	0.00	0.00	0.00	0.0	0.000
26.133	0.000	0.00	0.00	0.00	0.0	0.000
26.150	0.000	0.00	0.00	0.00	0.0	0.000
26.166	0.000	0.00	0.00	0.00	0.0	0.000
26.183	0.000	0.00	0.00	0.00	0.0	0.000
26.200	0.000	0.00	0.00	0.00	0.0	0.000
26.216	0.000	0.00	0.00	0.00	0.0	0.000
26.233	0.000	0.00	0.00	0.00	0.0	0.000
26.250	0.000	0.00	0.00	0.00	0.0	0.000
26.266	0.000	0.00	0.00	0.00	0.0	0.000
26.283	0.000	0.00	0.00	0.00	0.0	0.000
26.300	0.000	0.00	0.00	0.00	0.0	0.000
26.316	0.000	0.00	0.00	0.00	0.0	0.000
26.333	0.000	0.00	0.00	0.00	0.0	0.000
26.350	0.000	0.00	0.00	0.00	0.0	0.000
26.366	0.000	0.00	0.00	0.00	0.0	0.000
26.383	0.000	0.00	0.00	0.00	0.0	0.000
26.400	0.000	0.00	0.00	0.00	0.0	0.000
26.416	0.000	0.00	0.00	0.00	0.0	0.000
26.433	0.000	0.00	0.00	0.00	0.0	0.000
26.450	0.000	0.00	0.00	0.00	0.0	0.000
26.466	0.000	0.00	0.00	0.00	0.0	0.000
26.483	0.000	0.00	0.00	0.00	0.0	0.000
26.500	0.000	0.00	0.00	0.00	0.0	0.000
26.516	0.000	0.00	0.00	0.00	0.0	0.000
26.533	0.000	0.00	0.00	0.00	0.0	0.000
26.550	0.000	0.00	0.00	0.00	0.0	0.000
26.566	0.000	0.00	0.00	0.00	0.0	0.000
26.583	0.000	0.00	0.00	0.00	0.0	0.000
26.600	0.000	0.00	0.00	0.00	0.0	0.000
26.616	0.000	0.00	0.00	0.00	0.0	0.000
26.633	0.000	0.00	0.00	0.00	0.0	0.000
26.650	0.000	0.00	0.00	0.00	0.0	0.000
26.666	0.000	0.00	0.00	0.00	0.0	0.000
26.683	0.000	0.00	0.00	0.00	0.0	0.000
26.700	0.000	0.00	0.00	0.00	0.0	0.000
26.716	0.000	0.00	0.00	0.00	0.0	0.000
26.733	0.000	0.00	0.00	0.00	0.0	0.000
26.750	0.000	0.00	0.00	0.00	0.0	0.000
26.766	0.000	0.00	0.00	0.00	0.0	0.000
26.783	0.000	0.00	0.00	0.00	0.0	0.000
26.800	0.000	0.00	0.00	0.00	0.0	0.000
26.816	0.000	0.00	0.00	0.00	0.0	0.000
26.833	0.000	0.00	0.00	0.00	0.0	0.000
26.850	0.000	0.00	0.00	0.00	0.0	0.000
26.866	0.000	0.00	0.00	0.00	0.0	0.000
26.883	0.000	0.00	0.00	0.00	0.0	0.000
26.900	0.000	0.00	0.00	0.00	0.0	0.000
26.916	0.000	0.00	0.00	0.00	0.0	0.000
26.933	0.000	0.00	0.00	0.00	0.0	0.000
26.950	0.000	0.00	0.00	0.00	0.0	0.000
26.966	0.000	0.00	0.00	0.00	0.0	0.000
26.983	0.000	0.00	0.00	0.00	0.0	0.000
27.000	0.000	0.00	0.00	0.00	0.0	0.000
27.016	0.000	0.00	0.00	0.00	0.0	0.000
27.033	0.000	0.00	0.00	0.00	0.0	0.000
27.050	0.000	0.00	0.00	0.00	0.0	0.000
27.066	0.000	0.00	0.00	0.00	0.0	0.000
27.083	0.000	0.00	0.00	0.00	0.0	0.000
27.100	0.000	0.00	0.00	0.00	0.0	0.000
27.116	0.000	0.00	0.00	0.00	0.0	0.000
27.133	0.000	0.00	0.00	0.00	0.0	0.000
27.150	0.000	0.00	0.00	0.00	0.0	0.000
27.166	0.000	0.00	0.00	0.00	0.0	0.000
27.183	0.000	0.00	0.00	0.00	0.0	0.000
27.200	0.000	0.00	0.00	0.00	0.0	0.000
27.216	0.000	0.00	0.00	0.00	0.0	0.000
27.233	0.000	0.00	0.00	0.00	0.0	0.000
27.250	0.000	0.00	0.00	0.00	0.0	0.000
27.266	0.000	0.00	0.00	0.00	0.0	0.000
27.283	0.000	0.00	0.00	0.00	0.0	0.000
27.300	0.000	0.00	0.00	0.00	0.0	0.000
27.316	0.000	0.00	0.00	0.00	0.0	0.000
27.333	0.000	0.00	0.00	0.00	0.0	0.000

27.350	0.000	0.00	0.00	0.00	0.0	0.000
27.366	0.000	0.00	0.00	0.00	0.0	0.000
27.383	0.000	0.00	0.00	0.00	0.0	0.000
27.400	0.000	0.00	0.00	0.00	0.0	0.000
27.416	0.000	0.00	0.00	0.00	0.0	0.000
27.433	0.000	0.00	0.00	0.00	0.0	0.000
27.450	0.000	0.00	0.00	0.00	0.0	0.000
27.466	0.000	0.00	0.00	0.00	0.0	0.000
27.483	0.000	0.00	0.00	0.00	0.0	0.000
27.500	0.000	0.00	0.00	0.00	0.0	0.000
27.516	0.000	0.00	0.00	0.00	0.0	0.000
27.533	0.000	0.00	0.00	0.00	0.0	0.000
27.550	0.000	0.00	0.00	0.00	0.0	0.000
27.566	0.000	0.00	0.00	0.00	0.0	0.000
27.583	0.000	0.00	0.00	0.00	0.0	0.000
27.600	0.000	0.00	0.00	0.00	0.0	0.000
27.616	0.000	0.00	0.00	0.00	0.0	0.000
27.633	0.000	0.00	0.00	0.00	0.0	0.000
27.650	0.000	0.00	0.00	0.00	0.0	0.000
27.666	0.000	0.00	0.00	0.00	0.0	0.000
27.683	0.000	0.00	0.00	0.00	0.0	0.000
27.700	0.000	0.00	0.00	0.00	0.0	0.000
27.716	0.000	0.00	0.00	0.00	0.0	0.000
27.733	0.000	0.00	0.00	0.00	0.0	0.000
27.750	0.000	0.00	0.00	0.00	0.0	0.000
27.766	0.000	0.00	0.00	0.00	0.0	0.000
27.783	0.000	0.00	0.00	0.00	0.0	0.000
27.800	0.000	0.00	0.00	0.00	0.0	0.000
27.816	0.000	0.00	0.00	0.00	0.0	0.000
27.833	0.000	0.00	0.00	0.00	0.0	0.000
27.850	0.000	0.00	0.00	0.00	0.0	0.000
27.866	0.000	0.00	0.00	0.00	0.0	0.000
27.883	0.000	0.00	0.00	0.00	0.0	0.000
27.900	0.000	0.00	0.00	0.00	0.0	0.000
27.916	0.000	0.00	0.00	0.00	0.0	0.000
27.933	0.000	0.00	0.00	0.00	0.0	0.000
27.950	0.000	0.00	0.00	0.00	0.0	0.000
27.966	0.000	0.00	0.00	0.00	0.0	0.000
27.983	0.000	0.00	0.00	0.00	0.0	0.000
28.000	0.000	0.00	0.00	0.00	0.0	0.000
28.016	0.000	0.00	0.00	0.00	0.0	0.000
28.033	0.000	0.00	0.00	0.00	0.0	0.000
28.050	0.000	0.00	0.00	0.00	0.0	0.000
28.066	0.000	0.00	0.00	0.00	0.0	0.000
28.083	0.000	0.00	0.00	0.00	0.0	0.000
28.100	0.000	0.00	0.00	0.00	0.0	0.000
28.116	0.000	0.00	0.00	0.00	0.0	0.000
28.133	0.000	0.00	0.00	0.00	0.0	0.000
28.150	0.000	0.00	0.00	0.00	0.0	0.000
28.166	0.000	0.00	0.00	0.00	0.0	0.000
28.183	0.000	0.00	0.00	0.00	0.0	0.000
28.200	0.000	0.00	0.00	0.00	0.0	0.000
28.216	0.000	0.00	0.00	0.00	0.0	0.000
28.233	0.000	0.00	0.00	0.00	0.0	0.000
28.250	0.000	0.00	0.00	0.00	0.0	0.000
28.266	0.000	0.00	0.00	0.00	0.0	0.000
28.283	0.000	0.00	0.00	0.00	0.0	0.000
28.300	0.000	0.00	0.00	0.00	0.0	0.000
28.316	0.000	0.00	0.00	0.00	0.0	0.000
28.333	0.000	0.00	0.00	0.00	0.0	0.000
28.350	0.000	0.00	0.00	0.00	0.0	0.000
28.366	0.000	0.00	0.00	0.00	0.0	0.000
28.383	0.000	0.00	0.00	0.00	0.0	0.000
28.400	0.000	0.00	0.00	0.00	0.0	0.000
28.416	0.000	0.00	0.00	0.00	0.0	0.000
28.433	0.000	0.00	0.00	0.00	0.0	0.000
28.450	0.000	0.00	0.00	0.00	0.0	0.000
28.466	0.000	0.00	0.00	0.00	0.0	0.000
28.483	0.000	0.00	0.00	0.00	0.0	0.000
28.500	0.000	0.00	0.00	0.00	0.0	0.000
28.516	0.000	0.00	0.00	0.00	0.0	0.000
28.533	0.000	0.00	0.00	0.00	0.0	0.000
28.550	0.000	0.00	0.00	0.00	0.0	0.000
28.566	0.000	0.00	0.00	0.00	0.0	0.000
28.583	0.000	0.00	0.00	0.00	0.0	0.000
28.600	0.000	0.00	0.00	0.00	0.0	0.000
28.616	0.000	0.00	0.00	0.00	0.0	0.000
28.633	0.000	0.00	0.00	0.00	0.0	0.000
28.650	0.000	0.00	0.00	0.00	0.0	0.000

28.666	0.000	0.00	0.00	0.00	0.0	0.000
28.683	0.000	0.00	0.00	0.00	0.0	0.000
28.700	0.000	0.00	0.00	0.00	0.0	0.000
28.716	0.000	0.00	0.00	0.00	0.0	0.000
28.733	0.000	0.00	0.00	0.00	0.0	0.000
28.750	0.000	0.00	0.00	0.00	0.0	0.000
28.766	0.000	0.00	0.00	0.00	0.0	0.000
28.783	0.000	0.00	0.00	0.00	0.0	0.000
28.800	0.000	0.00	0.00	0.00	0.0	0.000
28.816	0.000	0.00	0.00	0.00	0.0	0.000
28.833	0.000	0.00	0.00	0.00	0.0	0.000
28.850	0.000	0.00	0.00	0.00	0.0	0.000
28.866	0.000	0.00	0.00	0.00	0.0	0.000
28.883	0.000	0.00	0.00	0.00	0.0	0.000
28.900	0.000	0.00	0.00	0.00	0.0	0.000
28.916	0.000	0.00	0.00	0.00	0.0	0.000
28.933	0.000	0.00	0.00	0.00	0.0	0.000
28.950	0.000	0.00	0.00	0.00	0.0	0.000
28.966	0.000	0.00	0.00	0.00	0.0	0.000
28.983	0.000	0.00	0.00	0.00	0.0	0.000
29.000	0.000	0.00	0.00	0.00	0.0	0.000
29.016	0.000	0.00	0.00	0.00	0.0	0.000
29.033	0.000	0.00	0.00	0.00	0.0	0.000
29.050	0.000	0.00	0.00	0.00	0.0	0.000
29.066	0.000	0.00	0.00	0.00	0.0	0.000
29.083	0.000	0.00	0.00	0.00	0.0	0.000
29.100	0.000	0.00	0.00	0.00	0.0	0.000
29.116	0.000	0.00	0.00	0.00	0.0	0.000
29.133	0.000	0.00	0.00	0.00	0.0	0.000
29.150	0.000	0.00	0.00	0.00	0.0	0.000
29.166	0.000	0.00	0.00	0.00	0.0	0.000
29.183	0.000	0.00	0.00	0.00	0.0	0.000
29.200	0.000	0.00	0.00	0.00	0.0	0.000
29.216	0.000	0.00	0.00	0.00	0.0	0.000
29.233	0.000	0.00	0.00	0.00	0.0	0.000
29.250	0.000	0.00	0.00	0.00	0.0	0.000
29.266	0.000	0.00	0.00	0.00	0.0	0.000
29.283	0.000	0.00	0.00	0.00	0.0	0.000
29.300	0.000	0.00	0.00	0.00	0.0	0.000
29.316	0.000	0.00	0.00	0.00	0.0	0.000
29.333	0.000	0.00	0.00	0.00	0.0	0.000
29.350	0.000	0.00	0.00	0.00	0.0	0.000
29.366	0.000	0.00	0.00	0.00	0.0	0.000
29.383	0.000	0.00	0.00	0.00	0.0	0.000
29.400	0.000	0.00	0.00	0.00	0.0	0.000
29.416	0.000	0.00	0.00	0.00	0.0	0.000
29.433	0.000	0.00	0.00	0.00	0.0	0.000
29.450	0.000	0.00	0.00	0.00	0.0	0.000
29.466	0.000	0.00	0.00	0.00	0.0	0.000
29.483	0.000	0.00	0.00	0.00	0.0	0.000
29.500	0.000	0.00	0.00	0.00	0.0	0.000
29.516	0.000	0.00	0.00	0.00	0.0	0.000
29.533	0.000	0.00	0.00	0.00	0.0	0.000
29.550	0.000	0.00	0.00	0.00	0.0	0.000
29.566	0.000	0.00	0.00	0.00	0.0	0.000
29.583	0.000	0.00	0.00	0.00	0.0	0.000
29.600	0.000	0.00	0.00	0.00	0.0	0.000
29.616	0.000	0.00	0.00	0.00	0.0	0.000
29.633	0.000	0.00	0.00	0.00	0.0	0.000
29.650	0.000	0.00	0.00	0.00	0.0	0.000
29.666	0.000	0.00	0.00	0.00	0.0	0.000
29.683	0.000	0.00	0.00	0.00	0.0	0.000
29.700	0.000	0.00	0.00	0.00	0.0	0.000
29.716	0.000	0.00	0.00	0.00	0.0	0.000
29.733	0.000	0.00	0.00	0.00	0.0	0.000
29.750	0.000	0.00	0.00	0.00	0.0	0.000
29.766	0.000	0.00	0.00	0.00	0.0	0.000
29.783	0.000	0.00	0.00	0.00	0.0	0.000
29.800	0.000	0.00	0.00	0.00	0.0	0.000
29.816	0.000	0.00	0.00	0.00	0.0	0.000
29.833	0.000	0.00	0.00	0.00	0.0	0.000
29.850	0.000	0.00	0.00	0.00	0.0	0.000
29.866	0.000	0.00	0.00	0.00	0.0	0.000
29.883	0.000	0.00	0.00	0.00	0.0	0.000
29.900	0.000	0.00	0.00	0.00	0.0	0.000
29.916	0.000	0.00	0.00	0.00	0.0	0.000
29.933	0.000	0.00	0.00	0.00	0.0	0.000
29.950	0.000	0.00	0.00	0.00	0.0	0.000
29.966	0.000	0.00	0.00	0.00	0.0	0.000

29.983	0.000	0.00	0.00	0.00	0.0	0.000
30.000	0.000	0.00	0.00	0.00	0.0	0.000
30.016	0.000	0.00	0.00	0.00	0.0	0.000
30.033	0.000	0.00	0.00	0.00	0.0	0.000
30.050	0.000	0.00	0.00	0.00	0.0	0.000
30.066	0.000	0.00	0.00	0.00	0.0	0.000
30.083	0.000	0.00	0.00	0.00	0.0	0.000
30.100	0.000	0.00	0.00	0.00	0.0	0.000
30.116	0.000	0.00	0.00	0.00	0.0	0.000
30.133	0.000	0.00	0.00	0.00	0.0	0.000
30.150	0.000	0.00	0.00	0.00	0.0	0.000
30.166	0.000	0.00	0.00	0.00	0.0	0.000
30.183	0.000	0.00	0.00	0.00	0.0	0.000
30.200	0.000	0.00	0.00	0.00	0.0	0.000
30.216	0.000	0.00	0.00	0.00	0.0	0.000
30.233	0.000	0.00	0.00	0.00	0.0	0.000
30.250	0.000	0.00	0.00	0.00	0.0	0.000
30.266	0.000	0.00	0.00	0.00	0.0	0.000
30.283	0.000	0.00	0.00	0.00	0.0	0.000
30.300	0.000	0.00	0.00	0.00	0.0	0.000
30.316	0.000	0.00	0.00	0.00	0.0	0.000
30.333	0.000	0.00	0.00	0.00	0.0	0.000
30.350	0.000	0.00	0.00	0.00	0.0	0.000
30.366	0.000	0.00	0.00	0.00	0.0	0.000
30.383	0.000	0.00	0.00	0.00	0.0	0.000
30.400	0.000	0.00	0.00	0.00	0.0	0.000
30.416	0.000	0.00	0.00	0.00	0.0	0.000
30.433	0.000	0.00	0.00	0.00	0.0	0.000
30.450	0.000	0.00	0.00	0.00	0.0	0.000
30.466	0.000	0.00	0.00	0.00	0.0	0.000
30.483	0.000	0.00	0.00	0.00	0.0	0.000
30.500	0.000	0.00	0.00	0.00	0.0	0.000
30.516	0.000	0.00	0.00	0.00	0.0	0.000
30.533	0.000	0.00	0.00	0.00	0.0	0.000
30.550	0.000	0.00	0.00	0.00	0.0	0.000
30.566	0.000	0.00	0.00	0.00	0.0	0.000
30.583	0.000	0.00	0.00	0.00	0.0	0.000
30.600	0.000	0.00	0.00	0.00	0.0	0.000
30.616	0.000	0.00	0.00	0.00	0.0	0.000
30.633	0.000	0.00	0.00	0.00	0.0	0.000
30.650	0.000	0.00	0.00	0.00	0.0	0.000
30.666	0.000	0.00	0.00	0.00	0.0	0.000
30.683	0.000	0.00	0.00	0.00	0.0	0.000
30.700	0.000	0.00	0.00	0.00	0.0	0.000
30.716	0.000	0.00	0.00	0.00	0.0	0.000
30.733	0.000	0.00	0.00	0.00	0.0	0.000
30.750	0.000	0.00	0.00	0.00	0.0	0.000
30.766	0.000	0.00	0.00	0.00	0.0	0.000
30.783	0.000	0.00	0.00	0.00	0.0	0.000
30.800	0.000	0.00	0.00	0.00	0.0	0.000
30.816	0.000	0.00	0.00	0.00	0.0	0.000
30.833	0.000	0.00	0.00	0.00	0.0	0.000
30.850	0.000	0.00	0.00	0.00	0.0	0.000
30.866	0.000	0.00	0.00	0.00	0.0	0.000
30.883	0.000	0.00	0.00	0.00	0.0	0.000
30.900	0.000	0.00	0.00	0.00	0.0	0.000
30.916	0.000	0.00	0.00	0.00	0.0	0.000
30.933	0.000	0.00	0.00	0.00	0.0	0.000
30.950	0.000	0.00	0.00	0.00	0.0	0.000
30.966	0.000	0.00	0.00	0.00	0.0	0.000
30.983	0.000	0.00	0.00	0.00	0.0	0.000
31.000	0.000	0.00	0.00	0.00	0.0	0.000
31.016	0.000	0.00	0.00	0.00	0.0	0.000
31.033	0.000	0.00	0.00	0.00	0.0	0.000
31.050	0.000	0.00	0.00	0.00	0.0	0.000
31.066	0.000	0.00	0.00	0.00	0.0	0.000
31.083	0.000	0.00	0.00	0.00	0.0	0.000
31.100	0.000	0.00	0.00	0.00	0.0	0.000
31.116	0.000	0.00	0.00	0.00	0.0	0.000
31.133	0.000	0.00	0.00	0.00	0.0	0.000
31.150	0.000	0.00	0.00	0.00	0.0	0.000
31.166	0.000	0.00	0.00	0.00	0.0	0.000
31.183	0.000	0.00	0.00	0.00	0.0	0.000
31.200	0.000	0.00	0.00	0.00	0.0	0.000
31.216	0.000	0.00	0.00	0.00	0.0	0.000
31.233	0.000	0.00	0.00	0.00	0.0	0.000
31.250	0.000	0.00	0.00	0.00	0.0	0.000
31.266	0.000	0.00	0.00	0.00	0.0	0.000
31.283	0.000	0.00	0.00	0.00	0.0	0.000

31.300	0.000	0.00	0.00	0.00	0.0	0.000
31.316	0.000	0.00	0.00	0.00	0.0	0.000
31.333	0.000	0.00	0.00	0.00	0.0	0.000
31.350	0.000	0.00	0.00	0.00	0.0	0.000
31.366	0.000	0.00	0.00	0.00	0.0	0.000
31.383	0.000	0.00	0.00	0.00	0.0	0.000
31.400	0.000	0.00	0.00	0.00	0.0	0.000
31.416	0.000	0.00	0.00	0.00	0.0	0.000
31.433	0.000	0.00	0.00	0.00	0.0	0.000
31.450	0.000	0.00	0.00	0.00	0.0	0.000
31.466	0.000	0.00	0.00	0.00	0.0	0.000
31.483	0.000	0.00	0.00	0.00	0.0	0.000
31.500	0.000	0.00	0.00	0.00	0.0	0.000
31.516	0.000	0.00	0.00	0.00	0.0	0.000
31.533	0.000	0.00	0.00	0.00	0.0	0.000
31.550	0.000	0.00	0.00	0.00	0.0	0.000
31.566	0.000	0.00	0.00	0.00	0.0	0.000
31.583	0.000	0.00	0.00	0.00	0.0	0.000
31.600	0.000	0.00	0.00	0.00	0.0	0.000
31.616	0.000	0.00	0.00	0.00	0.0	0.000
31.633	0.000	0.00	0.00	0.00	0.0	0.000
31.650	0.000	0.00	0.00	0.00	0.0	0.000
31.666	0.000	0.00	0.00	0.00	0.0	0.000
31.683	0.000	0.00	0.00	0.00	0.0	0.000
31.700	0.000	0.00	0.00	0.00	0.0	0.000
31.716	0.000	0.00	0.00	0.00	0.0	0.000
31.733	0.000	0.00	0.00	0.00	0.0	0.000
31.750	0.000	0.00	0.00	0.00	0.0	0.000
31.766	0.000	0.00	0.00	0.00	0.0	0.000
31.783	0.000	0.00	0.00	0.00	0.0	0.000
31.800	0.000	0.00	0.00	0.00	0.0	0.000
31.816	0.000	0.00	0.00	0.00	0.0	0.000
31.833	0.000	0.00	0.00	0.00	0.0	0.000
31.850	0.000	0.00	0.00	0.00	0.0	0.000
31.866	0.000	0.00	0.00	0.00	0.0	0.000
31.883	0.000	0.00	0.00	0.00	0.0	0.000
31.900	0.000	0.00	0.00	0.00	0.0	0.000
31.916	0.000	0.00	0.00	0.00	0.0	0.000
31.933	0.000	0.00	0.00	0.00	0.0	0.000
31.950	0.000	0.00	0.00	0.00	0.0	0.000
31.966	0.000	0.00	0.00	0.00	0.0	0.000
31.983	0.000	0.00	0.00	0.00	0.0	0.000
32.000	0.000	0.00	0.00	0.00	0.0	0.000
32.016	0.000	0.00	0.00	0.00	0.0	0.000
32.033	0.000	0.00	0.00	0.00	0.0	0.000
32.050	0.000	0.00	0.00	0.00	0.0	0.000
32.066	0.000	0.00	0.00	0.00	0.0	0.000
32.083	0.000	0.00	0.00	0.00	0.0	0.000
32.100	0.000	0.00	0.00	0.00	0.0	0.000
32.116	0.000	0.00	0.00	0.00	0.0	0.000
32.133	0.000	0.00	0.00	0.00	0.0	0.000
32.150	0.000	0.00	0.00	0.00	0.0	0.000
32.166	0.000	0.00	0.00	0.00	0.0	0.000
32.183	0.000	0.00	0.00	0.00	0.0	0.000
32.200	0.000	0.00	0.00	0.00	0.0	0.000
32.216	0.000	0.00	0.00	0.00	0.0	0.000
32.233	0.000	0.00	0.00	0.00	0.0	0.000
32.250	0.000	0.00	0.00	0.00	0.0	0.000
32.266	0.000	0.00	0.00	0.00	0.0	0.000
32.283	0.000	0.00	0.00	0.00	0.0	0.000
32.300	0.000	0.00	0.00	0.00	0.0	0.000
32.316	0.000	0.00	0.00	0.00	0.0	0.000
32.333	0.000	0.00	0.00	0.00	0.0	0.000
32.350	0.000	0.00	0.00	0.00	0.0	0.000
32.366	0.000	0.00	0.00	0.00	0.0	0.000
32.383	0.000	0.00	0.00	0.00	0.0	0.000
32.400	0.000	0.00	0.00	0.00	0.0	0.000
32.416	0.000	0.00	0.00	0.00	0.0	0.000
32.433	0.000	0.00	0.00	0.00	0.0	0.000
32.450	0.000	0.00	0.00	0.00	0.0	0.000
32.466	0.000	0.00	0.00	0.00	0.0	0.000
32.483	0.000	0.00	0.00	0.00	0.0	0.000
32.500	0.000	0.00	0.00	0.00	0.0	0.000
32.516	0.000	0.00	0.00	0.00	0.0	0.000
32.533	0.000	0.00	0.00	0.00	0.0	0.000
32.550	0.000	0.00	0.00	0.00	0.0	0.000
32.566	0.000	0.00	0.00	0.00	0.0	0.000
32.583	0.000	0.00	0.00	0.00	0.0	0.000
32.600	0.000	0.00	0.00	0.00	0.0	0.000

32.616	0.000	0.00	0.00	0.00	0.0	0.000
32.633	0.000	0.00	0.00	0.00	0.0	0.000
32.650	0.000	0.00	0.00	0.00	0.0	0.000
32.666	0.000	0.00	0.00	0.00	0.0	0.000
32.683	0.000	0.00	0.00	0.00	0.0	0.000
32.700	0.000	0.00	0.00	0.00	0.0	0.000
32.716	0.000	0.00	0.00	0.00	0.0	0.000
32.733	0.000	0.00	0.00	0.00	0.0	0.000
32.750	0.000	0.00	0.00	0.00	0.0	0.000
32.766	0.000	0.00	0.00	0.00	0.0	0.000
32.783	0.000	0.00	0.00	0.00	0.0	0.000
32.800	0.000	0.00	0.00	0.00	0.0	0.000
32.816	0.000	0.00	0.00	0.00	0.0	0.000
32.833	0.000	0.00	0.00	0.00	0.0	0.000
32.850	0.000	0.00	0.00	0.00	0.0	0.000
32.866	0.000	0.00	0.00	0.00	0.0	0.000
32.883	0.000	0.00	0.00	0.00	0.0	0.000
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32.983	0.000	0.00	0.00	0.00	0.0	0.000
33.000	0.000	0.00	0.00	0.00	0.0	0.000
33.016	0.000	0.00	0.00	0.00	0.0	0.000
33.033	0.000	0.00	0.00	0.00	0.0	0.000
33.050	0.000	0.00	0.00	0.00	0.0	0.000
33.066	0.000	0.00	0.00	0.00	0.0	0.000
33.083	0.000	0.00	0.00	0.00	0.0	0.000
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33.133	0.000	0.00	0.00	0.00	0.0	0.000
33.150	0.000	0.00	0.00	0.00	0.0	0.000
33.166	0.000	0.00	0.00	0.00	0.0	0.000
33.183	0.000	0.00	0.00	0.00	0.0	0.000
33.200	0.000	0.00	0.00	0.00	0.0	0.000
33.216	0.000	0.00	0.00	0.00	0.0	0.000
33.233	0.000	0.00	0.00	0.00	0.0	0.000
33.250	0.000	0.00	0.00	0.00	0.0	0.000
33.266	0.000	0.00	0.00	0.00	0.0	0.000
33.283	0.000	0.00	0.00	0.00	0.0	0.000
33.300	0.000	0.00	0.00	0.00	0.0	0.000
33.316	0.000	0.00	0.00	0.00	0.0	0.000
33.333	0.000	0.00	0.00	0.00	0.0	0.000
33.350	0.000	0.00	0.00	0.00	0.0	0.000
33.366	0.000	0.00	0.00	0.00	0.0	0.000
33.383	0.000	0.00	0.00	0.00	0.0	0.000
33.400	0.000	0.00	0.00	0.00	0.0	0.000
33.416	0.000	0.00	0.00	0.00	0.0	0.000
33.433	0.000	0.00	0.00	0.00	0.0	0.000
33.450	0.000	0.00	0.00	0.00	0.0	0.000
33.466	0.000	0.00	0.00	0.00	0.0	0.000
33.483	0.000	0.00	0.00	0.00	0.0	0.000
33.500	0.000	0.00	0.00	0.00	0.0	0.000
33.516	0.000	0.00	0.00	0.00	0.0	0.000
33.533	0.000	0.00	0.00	0.00	0.0	0.000
33.550	0.000	0.00	0.00	0.00	0.0	0.000
33.566	0.000	0.00	0.00	0.00	0.0	0.000
33.583	0.000	0.00	0.00	0.00	0.0	0.000
33.600	0.000	0.00	0.00	0.00	0.0	0.000
33.616	0.000	0.00	0.00	0.00	0.0	0.000
33.633	0.000	0.00	0.00	0.00	0.0	0.000
33.650	0.000	0.00	0.00	0.00	0.0	0.000
33.666	0.000	0.00	0.00	0.00	0.0	0.000
33.683	0.000	0.00	0.00	0.00	0.0	0.000
33.700	0.000	0.00	0.00	0.00	0.0	0.000
33.716	0.000	0.00	0.00	0.00	0.0	0.000
33.733	0.000	0.00	0.00	0.00	0.0	0.000
33.750	0.000	0.00	0.00	0.00	0.0	0.000
33.766	0.000	0.00	0.00	0.00	0.0	0.000
33.783	0.000	0.00	0.00	0.00	0.0	0.000
33.800	0.000	0.00	0.00	0.00	0.0	0.000
33.816	0.000	0.00	0.00	0.00	0.0	0.000
33.833	0.000	0.00	0.00	0.00	0.0	0.000
33.850	0.000	0.00	0.00	0.00	0.0	0.000
33.866	0.000	0.00	0.00	0.00	0.0	0.000
33.883	0.000	0.00	0.00	0.00	0.0	0.000
33.900	0.000	0.00	0.00	0.00	0.0	0.000
33.916	0.000	0.00	0.00	0.00	0.0	0.000

33.933	0.000	0.00	0.00	0.00	0.0	0.000
33.950	0.000	0.00	0.00	0.00	0.0	0.000
33.966	0.000	0.00	0.00	0.00	0.0	0.000
33.983	0.000	0.00	0.00	0.00	0.0	0.000
34.000	0.000	0.00	0.00	0.00	0.0	0.000
34.016	0.000	0.00	0.00	0.00	0.0	0.000
34.033	0.000	0.00	0.00	0.00	0.0	0.000
34.050	0.000	0.00	0.00	0.00	0.0	0.000
34.066	0.000	0.00	0.00	0.00	0.0	0.000
34.083	0.000	0.00	0.00	0.00	0.0	0.000
34.100	0.000	0.00	0.00	0.00	0.0	0.000
34.116	0.000	0.00	0.00	0.00	0.0	0.000
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34.150	0.000	0.00	0.00	0.00	0.0	0.000
34.166	0.000	0.00	0.00	0.00	0.0	0.000
34.183	0.000	0.00	0.00	0.00	0.0	0.000
34.200	0.000	0.00	0.00	0.00	0.0	0.000
34.216	0.000	0.00	0.00	0.00	0.0	0.000
34.233	0.000	0.00	0.00	0.00	0.0	0.000
34.250	0.000	0.00	0.00	0.00	0.0	0.000
34.266	0.000	0.00	0.00	0.00	0.0	0.000
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34.300	0.000	0.00	0.00	0.00	0.0	0.000
34.316	0.000	0.00	0.00	0.00	0.0	0.000
34.333	0.000	0.00	0.00	0.00	0.0	0.000
34.350	0.000	0.00	0.00	0.00	0.0	0.000
34.366	0.000	0.00	0.00	0.00	0.0	0.000
34.383	0.000	0.00	0.00	0.00	0.0	0.000
34.400	0.000	0.00	0.00	0.00	0.0	0.000
34.416	0.000	0.00	0.00	0.00	0.0	0.000
34.433	0.000	0.00	0.00	0.00	0.0	0.000
34.450	0.000	0.00	0.00	0.00	0.0	0.000
34.466	0.000	0.00	0.00	0.00	0.0	0.000
34.483	0.000	0.00	0.00	0.00	0.0	0.000
34.500	0.000	0.00	0.00	0.00	0.0	0.000
34.516	0.000	0.00	0.00	0.00	0.0	0.000
34.533	0.000	0.00	0.00	0.00	0.0	0.000
34.550	0.000	0.00	0.00	0.00	0.0	0.000
34.566	0.000	0.00	0.00	0.00	0.0	0.000
34.583	0.000	0.00	0.00	0.00	0.0	0.000
34.600	0.000	0.00	0.00	0.00	0.0	0.000
34.616	0.000	0.00	0.00	0.00	0.0	0.000
34.633	0.000	0.00	0.00	0.00	0.0	0.000
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34.666	0.000	0.00	0.00	0.00	0.0	0.000
34.683	0.000	0.00	0.00	0.00	0.0	0.000
34.700	0.000	0.00	0.00	0.00	0.0	0.000
34.716	0.000	0.00	0.00	0.00	0.0	0.000
34.733	0.000	0.00	0.00	0.00	0.0	0.000
34.750	0.000	0.00	0.00	0.00	0.0	0.000
34.766	0.000	0.00	0.00	0.00	0.0	0.000
34.783	0.000	0.00	0.00	0.00	0.0	0.000
34.800	0.000	0.00	0.00	0.00	0.0	0.000
34.816	0.000	0.00	0.00	0.00	0.0	0.000
34.833	0.000	0.00	0.00	0.00	0.0	0.000
34.850	0.000	0.00	0.00	0.00	0.0	0.000
34.866	0.000	0.00	0.00	0.00	0.0	0.000
34.883	0.000	0.00	0.00	0.00	0.0	0.000
34.900	0.000	0.00	0.00	0.00	0.0	0.000
34.916	0.000	0.00	0.00	0.00	0.0	0.000
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34.950	0.000	0.00	0.00	0.00	0.0	0.000
34.966	0.000	0.00	0.00	0.00	0.0	0.000
34.983	0.000	0.00	0.00	0.00	0.0	0.000
35.000	0.000	0.00	0.00	0.00	0.0	0.000
35.016	0.000	0.00	0.00	0.00	0.0	0.000
35.033	0.000	0.00	0.00	0.00	0.0	0.000
35.050	0.000	0.00	0.00	0.00	0.0	0.000
35.066	0.000	0.00	0.00	0.00	0.0	0.000
35.083	0.000	0.00	0.00	0.00	0.0	0.000
35.100	0.000	0.00	0.00	0.00	0.0	0.000
35.116	0.000	0.00	0.00	0.00	0.0	0.000
35.133	0.000	0.00	0.00	0.00	0.0	0.000
35.150	0.000	0.00	0.00	0.00	0.0	0.000
35.166	0.000	0.00	0.00	0.00	0.0	0.000
35.183	0.000	0.00	0.00	0.00	0.0	0.000
35.200	0.000	0.00	0.00	0.00	0.0	0.000
35.216	0.000	0.00	0.00	0.00	0.0	0.000
35.233	0.000	0.00	0.00	0.00	0.0	0.000

35.250	0.000	0.00	0.00	0.00	0.0	0.000
35.266	0.000	0.00	0.00	0.00	0.0	0.000
35.283	0.000	0.00	0.00	0.00	0.0	0.000
35.300	0.000	0.00	0.00	0.00	0.0	0.000
35.316	0.000	0.00	0.00	0.00	0.0	0.000
35.333	0.000	0.00	0.00	0.00	0.0	0.000
35.350	0.000	0.00	0.00	0.00	0.0	0.000
35.366	0.000	0.00	0.00	0.00	0.0	0.000
35.383	0.000	0.00	0.00	0.00	0.0	0.000
35.400	0.000	0.00	0.00	0.00	0.0	0.000
35.416	0.000	0.00	0.00	0.00	0.0	0.000
35.433	0.000	0.00	0.00	0.00	0.0	0.000
35.450	0.000	0.00	0.00	0.00	0.0	0.000
35.466	0.000	0.00	0.00	0.00	0.0	0.000
35.483	0.000	0.00	0.00	0.00	0.0	0.000
35.500	0.000	0.00	0.00	0.00	0.0	0.000
35.516	0.000	0.00	0.00	0.00	0.0	0.000
35.533	0.000	0.00	0.00	0.00	0.0	0.000
35.550	0.000	0.00	0.00	0.00	0.0	0.000
35.566	0.000	0.00	0.00	0.00	0.0	0.000
35.583	0.000	0.00	0.00	0.00	0.0	0.000
35.600	0.000	0.00	0.00	0.00	0.0	0.000
35.616	0.000	0.00	0.00	0.00	0.0	0.000
35.633	0.000	0.00	0.00	0.00	0.0	0.000
35.650	0.000	0.00	0.00	0.00	0.0	0.000
35.666	0.000	0.00	0.00	0.00	0.0	0.000
35.683	0.000	0.00	0.00	0.00	0.0	0.000
35.700	0.000	0.00	0.00	0.00	0.0	0.000
35.716	0.000	0.00	0.00	0.00	0.0	0.000
35.733	0.000	0.00	0.00	0.00	0.0	0.000
35.750	0.000	0.00	0.00	0.00	0.0	0.000
35.766	0.000	0.00	0.00	0.00	0.0	0.000
35.783	0.000	0.00	0.00	0.00	0.0	0.000
35.800	0.000	0.00	0.00	0.00	0.0	0.000
35.816	0.000	0.00	0.00	0.00	0.0	0.000
35.833	0.000	0.00	0.00	0.00	0.0	0.000
35.850	0.000	0.00	0.00	0.00	0.0	0.000
35.866	0.000	0.00	0.00	0.00	0.0	0.000
35.883	0.000	0.00	0.00	0.00	0.0	0.000
35.900	0.000	0.00	0.00	0.00	0.0	0.000
35.916	0.000	0.00	0.00	0.00	0.0	0.000
35.933	0.000	0.00	0.00	0.00	0.0	0.000
35.950	0.000	0.00	0.00	0.00	0.0	0.000
35.966	0.000	0.00	0.00	0.00	0.0	0.000
35.983	0.000	0.00	0.00	0.00	0.0	0.000
36.000	0.000	0.00	0.00	0.00	0.0	0.000

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 4.817 AF
BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 4.819 AF
LOSS VOLUME = 0.000 AF

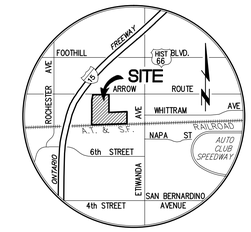
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END OF FLOODSCx ROUTING ANALYSIS

APPENDIX D

HYDROLOGY MAPS





VICINITY MAP
N.T.S.

0 50 100 200 300
SCALE: 1"=100'

CITY OF RANCHO CUCAMONGA
PUBLIC WORKS DEPARTMENT

HYDROLOGY MAP
EXISTING CONDITION

ARROW ROUTE AND JUNEBERRY DRIVE
RANCHO CUCAMONGA

4021/1 OF 1 SHEET

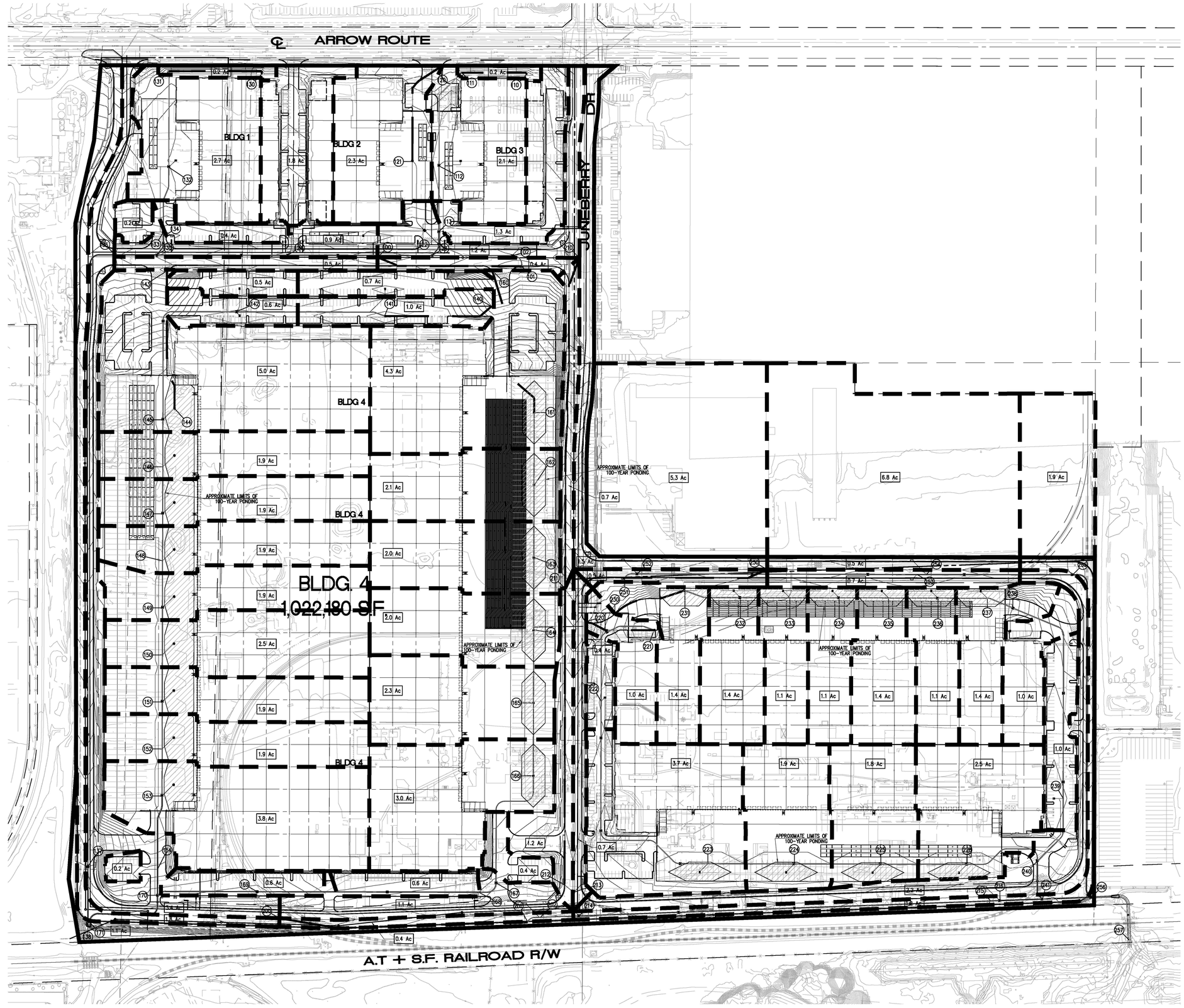
PREPARED FOR:
BLACK CREEK GROUP
4675 MACARTHUR COURT, SUITE 625
NEWPORT BEACH, CA 92660
PHONE: (949) 892-4900
CONTACT: CHRIS SANFORD
chris.sanford@blackcreekgroup.com

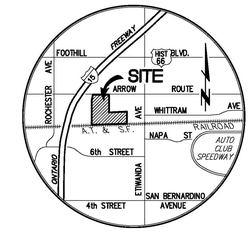
PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Last Update:5/17/23
O:\4000-4099\4021\4021HYD-EX.dwg

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____
Public Works Director _____ R.C.E. XXXXX

Sheet 1 of 1 Sheets





VICINITY MAP
N.T.S.

LEGEND

- PROJECT BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- 4.10 AC. — SUBAREA AREA
- 100 — NODE NUMBER
- APPROXIMATE LIMITS OF 100-YEAR PONDING

0 50 100 200 300
SCALE: 1"=100'

Last Update: 11/9/23
D:\4000-4099\4021\4021HYD.dwg

CITY OF ONTARIO
PUBLIC WORKS DEPARTMENT

PROPOSED CONDITION HYDROLOGY MAP

ARROW ROUTE AND JUNEBERRY DRIVE
RANCHO CUCAMONGA

4021/ 1 OF 1 SHEET

PREPARED FOR:
BLACK CREEK GROUP
4675 MACARTHUR COURT, SUITE 625
NEWPORT BEACH, CA 92660
PHONE: (949) 892-4900
CONTACT: CHRIS SANFORD
chris.sanford@blackcreekgroup.com

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14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____
Approved by _____ Date _____
Public Works Director R.C.E. XXXXX
Sheet 1 of 1 Sheets

Appendix B

Preliminary Water Quality Management Plan
for Arrow Route and Juneberry Drive Industrial Development

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

Preliminary
Water Quality Management Plan
(PWQMP)

For:

Arrow Route and Juneberry Drive
Rancho Cucamonga, CA 91739
WQMPXXXX-XXXXX

APN: 0229-121-33, -34, -35 & 0229-131-19

Prepared for:
BTC III Arrow Route CC LP
4675 MacArthur Court, Suite 625
Newport Beach, CA 92660
Phone: (949) 892-4900
Contact: Chris Sanford

Prepared by:
Thienes Engineering, Inc.
14349 Firestone Boulevard
La Mirada, CA 90638
Phone: (714) 521-4811
Contact: Luis Prado (luisp@thieneseng.com)
Job No. 4021

Approval Date: _____
Implementation Date: _____

1st Submittal: May 18, 2023
2nd Submittal: _____
3rd Submittal: _____

Project Owner's Certification

This Water Quality Management Plan (WQMP) has been prepared for ***BTC III Arrow Route CC LP*** by ***Thienes Engineering, Inc***. The WQMP is intended to comply with the requirements of the ***City of Rancho Cucamonga*** and the NPDES Areawide Stormwater Program requiring the preparation of a WQMP.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the San Bernardino County's Municipal Storm Water Management Program and the intent of the NPDES Permit for San Bernardino County and the incorporated cities of San Bernardino County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors in interest and the city/county shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the approved WQMP shall be available on the subject site in perpetuity.

"I certify under a penalty of law that the provisions (implementation, operation, maintenance, and fund) of the WQMP have been accepted and that the plan will be transferred to future successors."

Project Data			
Permit/Application Number(s):	WQMPXXXX-XXXXX	**Grading Permit Number(s):**	PGRXXXX-XXXXX
Tract/Parcel Map Number(s):		**Building Permit Number(s):**	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN: 0229-121-33, -34, -35 & 0229-131-19

Owner's Signature			
Owner Name: BTC III Arrow Route CC LP			
Title	Chris Sanford, Senior Vice President		
Company	BTC III Arrow Route CC LP		
Address	4675 MacArthur Court, Suite 625, Newport Beach, CA 92660		
Email	chris.sanford@aresmgmt.com		
Telephone #	(949) 892-4900		
Signature		**Date**	

Preparer's Certification

Project Data			
Permit/Application Number(s):	WQMPXXXX-XXXXX	**Grading Permit Number(s):**	PGRXXXX-XXXXX
Tract/Parcel Map Number(s):		**Building Permit Number(s):**	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN: 0229-121-33, -34, -35 & 0229-131-19

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan were prepared under my oversight and meet the requirements of Regional Water Quality Control Board Order No. R8-2010-0036."

Engineer: Reinhard Stenzel		**PE Stamp Below:**
Title	Director of Engineering	
Company	Thienes Engineering, Inc.	
Address	14349 Firestone Boulevard, La Mirada, CA 90638	
Email	reinhard@thieneseng.com	
Telephone #	(714) 521-4811	
Signature		
Date	5/18/2023	



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Section 1 Discretionary Permit(s)

Form 1-1 Project Information

Project Name	Arrow Route and Juneberry Drive				
Project Owner Contact Name:	Chris Sanford				
Mailing Address:	4675 MacArthur Court, Suite 625 Newport Beach, CA 92660	**E-mail Address:**	chris.sanford@aresmgmt.com	**Telephone:**	(949) 892-4900
Permit/Application Number(s):	PGRXXXX-XXXXX WQMPXXXX-XXXXX		**Tract/Parcel Map Number(s):**		
Additional Information/ Comments:	n/a				
Description of Project:	The project site encompasses approximately 95.59 acres, where 80.65 acres includes onsite improvements, and 14.94 acres includes new public roads or small offsite improvements. Proposed improvements to the onsite include construction of five warehouse type buildings. Truck yards are located on the westerly sides of Buildings 1 and 3, easterly side of Building 2, westerly and easterly sides of Building 4 and northerly and southerly sides of Building 5. The remainder of the onsite will be paved drive aisles, vehicle parking, and landscaping along the site's perimeter and adjacent to the buildings. Proposed improvements to the offsite include the construction of new public streets. Two public storm drain systems will be proposed to collect onsite and offsite runoff. The westerly public storm drain will discharge offsite at the southwest corner of the site while the easterly public storm drain will discharge offsite at the southeast corner of the site. The westerly public storm drain will collect onsite runoff from Buildings 1-4, and offsite runoff from the new public streets located west of Buildings 1 and 4, north of Building 4 (between Buildings 1-3 and Building 4), from a portion of the new public street south of Building 4 and from a portion of Yellow Wood Road. The easterly public storm drain will collect onsite runoff from Building 5 and offsite runoff from the new public streets located west of Building 4 (a portion of Yellow Wood Road), south of Buildings 4 and 5 and from the new public streets located north and east of Building 5. Runoff from Buildings 1-3 will drain to catch basins located in the truck yards and vehicle parking areas. Runoff will then be conveyed southerly via three private storm drain systems and connect to the proposed public storm drain located in the new public street between Buildings 1-3 and Building 4. The public storm drain will convey runoff westerly, then southerly towards the southwest corner of the project site where runoff will outlet via a proposed headwall and continue draining southerly across the railroad tracks via existing CMP pipes. Runoff from Building 4 will drain to catch basins located in the truck yards and in the vehicle parking areas. Runoff will then be conveyed towards the southwest corner of the site via a private storm drain system and connect to the proposed public storm drain located in the new public street that's west of Building 4. Runoff from Building 5 will drain to catch basins located in the truck yards and in the vehicle parking areas. Runoff will then be conveyed towards the southeast corner of the site via a private storm drain system and connect to the proposed public storm drain located in the new public street that's south of Building 5. Runoff will then connect to an existing storm drain located south of the existing railroad tracks. Per the Subsurface Investigation Report prepared by Roux: Environmental Consulting and Management dated April 7, 2023, slag (an operational byproduct containing metals) was found in soils at the southwest portion of the site. Additionally, total petroleum hydrocarbon (TPH) and volatile organic compounds (VOCs) were detected at the southeast portion of the site. Under these conditions, infiltration dependent BMPs are not proposed at these locations. Refer to Attachment K for an excerpt of the Subsurface Investigation Report. Prior to discharging offsite, runoff from the site (with the exception of DA 5 DMA B) will be				

	directed to underground retention facilities for infiltration. The underground retention facility treating DA 4 DMA A was placed further north along the west side of the Building 4 to avoid the affected southwest area. The BMPs treating DA 5 DMA B will consist of solid underground CMPs (for detention) and proprietary biofiltration units. Drain inserts at each catch basin will serve as pretreatment. Approximately 3.19 acres of landscaping (and some driveways) along the perimeters of the project site will sheet flow offsite without being routed to the LID BMPs. However, although these areas are considered self-treating, they are included in the design capture volume (DCV) calculations. Lastly, the project site will utilize the maximum extent practicable (MEP) principle in order to treat disturbed Public Right-of-Way (ROW) impervious areas onsite. This area is approximately 14.94 acres and is included along with the onsite DCV.
Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.	Pending

Section 2 Project Description

2.1 Project Information

This section of the WQMP should provide the information listed below. The information provided for Conceptual/ Preliminary WQMP should give sufficient detail to identify the major proposed site design and LID BMPs and other anticipated water quality features that impact site planning. Final Project WQMP must specifically identify all BMP incorporated into the final site design and provide other detailed information as described herein.

The purpose of this information is to help determine the applicable development category, pollutants of concern, watershed description, and long term maintenance responsibilities for the project, and any applicable water quality credits. This information will be used in conjunction with the information in Section 3, Site Description, to establish the performance criteria and to select the LID BMP or other BMP for the project or other alternative programs that the project will participate in, which are described in Section 4.

Form 2.1-1 Description of Proposed Project

[1] Development Category (Select all that apply):

☒ Significant re-development involving the addition or replacement of 5,000 ft² or more of impervious surface on an already developed site	☐ New development involving the creation of 10,000 ft² or more of impervious surface collectively over entire site	☐ Automotive repair shops with standard industrial classification (SIC) codes 5013, 5014, 5541, 7532- 7534, 7536-7539	☐ Restaurants (with SIC code 5812) where the land area of development is 5,000 ft² or more
☐ Hillside developments of 5,000 ft² or more which are located on areas with known erosive soil conditions or where the natural slope is 25 percent or more	☐ Developments of 2,500 ft² of impervious surface or more adjacent to (within 200 ft) or discharging directly into environmentally sensitive areas or waterbodies listed on the CWA Section 303(d) list of impaired waters.	☒ Parking lots of 5,000 ft² or more exposed to storm water	☐ Retail gasoline outlets that are either 5,000 ft² or more, or have a projected average daily traffic of 100 or more vehicles per day

☐ Non-Priority / Non-Category Project

May require source control LID BMPs and other LIP requirements. Please consult with local jurisdiction on specific requirements.

[2] Project Area (ft²):	4,163,900 sq-ft 95.59 acres*	**[3] Number of Dwelling Units:**	n/a	**[4] SIC Code:**	4225

[5] Is Project going to be phased? ☐Yes ☒No

If yes, ensure that the WQMP evaluates each phase as a distinct DA, requiring LID BMPs to address runoff at time of completion.

[6] Does Project include roads? ☒Yes ☐No

If yes, ensure that applicable requirements for transportation projects are addressed (see Appendix A of TGD for WQMP)

* This includes approximately 14.94 acres of offsite improvements (new public streets).

2.2 Property Ownership/Management

Describe the ownership/management of all portions of the project and site. State whether any infrastructure will transfer to public agencies (City, County, Caltrans, etc.) after project completion. State if a homeowners or property owners association will be formed and be responsible for the long-term maintenance of project stormwater facilities. Describe any lot-level stormwater features that will be the responsibility of individual property owners.

Form 2.2-1 Property Ownership/Management

Describe property ownership/management responsible for long-term maintenance of WQMP stormwater facilities:

BTC III Arrow Route CC LP
4675 MacArthur Court, Suite 625
Newport Beach, CA 92660
Phone: (949) 892-4900
Contact: Chris Sanford

No infrastructure will be transferred to a public agency after project completion.
A property owner's association (POA) will be formed for long-term maintenance of project stormwater facilities.

2.3 Potential Stormwater Pollutants

Determine and describe expected stormwater pollutants of concern based on land uses and site activities (refer to Table 3-3 in the TGD for WQMP).

Form 2.3-1 Pollutants of Concern

Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	Including petroleum hydrocarbons. Bacterial indicators are routinely detected in pavement runoff.
Nutrients - Phosphorous	E ☒	N ☐	Expected pollutant if landscaping exists on-site.
Nutrients - Nitrogen	E ☒	N ☐	Expected pollutant if landscaping exists on-site.
Noxious Aquatic Plants	E ☒	N ☐	Expected pollutant if landscaping exists on-site.
Sediment / TSS / pH	E ☒	N ☐	Expected pollutant if landscaping exists on-site.
Metals	E ☒	N ☐	Expected pollutant if parking lots exist on-site.
Oil and Grease	E ☒	N ☐	Expected pollutant if parking lots exist on-site.
Trash & Debris	E ☒	N ☐	Expected pollutant if landscaping and parking lots exists on-site.
Pesticides / Herbicides	E ☒	N ☐	Expected pollutant if landscaping exists on-site.
Organic Compounds	E ☒	N ☐	Expected pollutant if landscaping exists on-site. Including solvents. Bacterial indicators are routinely detected in pavement runoff.
Oxygen Demanding Compounds	E ☐	N ☐	Expected pollutant if landscaping exists on-site.
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

The expected POCs for the project site are ***Pathogens, Nutrients, and Metals***.

2.4 Water Quality Credits

A water quality credit program is applicable for certain types of development projects if it is not feasible to meet the requirements for on-site LID. Proponents for eligible projects, as described below, can apply for water quality credits that would reduce project obligations for selecting and sizing other treatment BMP or participating in other alternative compliance programs. Refer to Section 6.2 in the TGD for WQMP to determine if water quality credits are applicable for the project.

Form 2.4-1 Water Quality Credits

[1] **Project Types that Qualify for Water Quality Credits:** *Select all that apply*			
☐ Redevelopment projects that reduce the overall impervious footprint of the project site. [Credit = % impervious reduced]	Higher density development projects ☐ Vertical density [20%] ☐ 7 units/ acre [5%]	☐ Mixed use development, (combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that demonstrate environmental benefits not realized through single use projects) [20%]	☐ Brownfield redevelopment (redevelop real property complicated by presence or potential of hazardous contaminants) [25%]
☐ Redevelopment projects in established historic district, historic preservation area, or similar significant core city center areas [10%]	☐ Transit-oriented developments (mixed use residential or commercial area designed to maximize access to public transportation) [20%]	☐ In-fill projects (conversion of empty lots & other underused spaces < 5 acres, substantially surrounded by urban land uses, into more beneficially used spaces, such as residential or commercial areas) [10%]	☐ Live-Work developments (variety of developments designed to support residential and vocational needs) [20%]
[2] **Total Credit %:** n/a *(Total all credit percentages up to a maximum allowable credit of 50 percent)*			
Description of Water Quality Credit Eligibility (if applicable)	n/a		

The proposed project will ***not*** utilize any water quality credits.

Section 3 Site and Watershed Description

Describe the project site conditions that will facilitate the selection of BMP through an analysis of the physical conditions and limitations of the site and its receiving waters. Identify distinct drainage areas (DA) that collect flow from a portion of the site and describe how runoff from each DA (and sub-watershed DMAs) is conveyed to the site outlet(s). Refer to Section 3.2 in the TGD for WQMP. Complete form 3.2 for each DA on the project site.

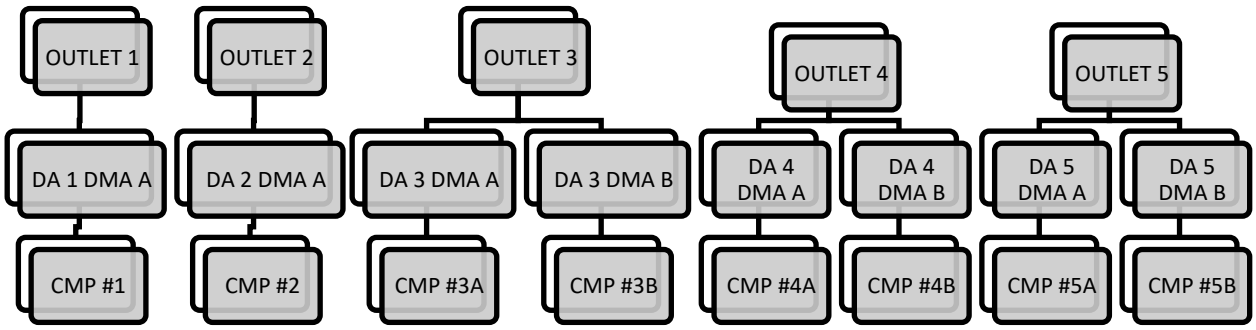
Form 3-1 Site Location and Hydrologic Features

Site coordinates *Take GPS measurement at approximate center of site*	**Latitude:** 34.095065	**Longitude:** -117.53340	**Thomas Bros Map page:** Page 603

[1] San Bernardino County climatic region: ☒Valley ☐Mountain ☐Desert

[2] Does the site have more than one drainage area (DA): ☒Yes ☐No

If no, proceed to Form 3-2. If yes, then use this form to show a conceptual schematic describing DMAs and hydrologic feature connecting DMAs to the site outlet(s). An example is provided below that can be modified for proposed project or a drawing clearly showing DMA and flow routing may be attached.



Conveyance	*Briefly describe on-site drainage features to convey runoff that is not retained within a DMA*
DA 1 DMA A flows to Outlet 1	Prior to runoff discharging to the proposed onsite storm drain, the low flows from DA 1 DMA A will be directed to an underground retention system for infiltration (CMP #1).
DA 2 DMA A flows to Outlet 2	Prior to runoff discharging to the proposed onsite storm drain, the low flows from DA 2 DMA A will be directed to an underground retention system for infiltration (CMP #2).
DA 3 DMA A flows to Outlet 3	Prior to runoff discharging to the proposed onsite storm drain, the low flows from DA 3 DMA A will be directed to an underground retention system for infiltration (CMP #3A).
DA 3 DMA B flows to Outlet 3	Prior to runoff discharging to the proposed onsite storm drain, the low flows from DA 3 DMA B will be directed to an underground retention system for infiltration (CMP #3B).
DA 4 DMA A flows to Outlet 4	Prior to runoff discharging to the proposed onsite storm drain, the low flows from DA 4 DMA A will be directed to an underground retention system for infiltration (CMP #4A). DA 4 DMA A includes ROW improvements from the new public streets.
DA 4 DMA B flows to Outlet 4	Prior to runoff discharging to the proposed onsite storm drain, the low flows from DA 4 DMA B will be directed to an underground retention system for infiltration (CMP #4B).
DA 5 DMA A flows to Outlet 5	Prior to runoff discharging to the proposed onsite storm drain, the low flows from DA 5 DMA A will be directed to an underground retention system for infiltration (CMP #5A). DA 5 DMA A includes ROW improvements from the new public streets.

DA 5 DMA B flows to Outlet 5	Prior to runoff discharging to the proposed onsite storm drain, the low flows from DA 5 DMA B will be directed to an underground detention system (CMP #5B) and proprietary biofiltration system.

Form 3-2 Existing Hydrologic Characteristics for Drainage Area (DA)

For each drainage area's sub-watershed DMA, provide the following characteristics	Hydrology Nodes (100-102)	Hydrology Nodes (200-204)	Hydrology Nodes (210-212)	Hydrology Nodes (220-226)	Hydrology Nodes (300-303)	Hydrology Nodes (310-314)
[1] **DMA drainage area (ft^2)**	512,701 (11.77 ac)	383,764 (8.81 ac)	835,481 (19.18 ac)	420,354 (9.65 ac)	1,219,680 (28.00 ac)	1,441,836 (33.10 ac)
[2] **Existing site impervious area (ft^2)**	465,192	335,093	567,348	335,091	293,192	186,785
[3] **Antecedent moisture condition** *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	AMC II	AMC II	AMC II	AMC II	AMC II	AMC II
[4] **Hydrologic soil group** *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	HSG A	HSG A	HSG A	HSG A	HSG A	HSG A
[5] **Longest flowpath length (ft)**	1,505	2,629	1,616	1,662	3,314	2,325
[6] **Longest flowpath slope (ft/ft)**	0.0051	0.0131	0.0111	0.0105	0.0110	0.0106
[7] **Current land cover type(s)** *Select from Fig C-3 of Hydrology Manual*	Commercial	Commercial	Commercial	Commercial	Commercial	Commercial
[8] **Pre-developed pervious area condition:** *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% See Attachment A for photos of site to support rating*	Poor	Poor	Poor	Poor	Poor	Poor

The drainage areas above include an additional 14.92 acres of offsite run-on.

Form 3-3 Watershed Description

Receiving Waters *Refer to Watershed Mapping Tool - http://sbcounty.permitrack.com/WAP* *See 'Drainage Facilities" link at this website*	Day Creek Cucamonga Creek, Reach 1 Mill Creek (Prado Area) Chino Creek, Reach 1A Santa Ana River, Reach 3 Santa Ana River, Reach 2 Santa Ana River, Reach 1 Pacific Ocean
Applicable TMDLs *Refer to Local Implementation Plan*	Day Creek: None Cucamonga Creek, Reach 1: Indicator Bacteria Mill Creek (Prado Area): Indicator Bacteria Chino Creek, Reach 1A: Indicator Bacteria Santa Ana River, Reach 3: Indicator Bacteria Santa Ana River, Reach 2: None Santa Ana River, Reach 1: None Pacific Ocean: None
303(d) listed impairments *Refer to Local Implementation Plan and Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP and State Water Resources Control Board website – http://www.waterboards.ca.gov/santaana/water_iss ues/programs/tmdl/index.shtml*	Day Creek: None Cucamonga Creek, Reach 1: Cadmium, Copper, Lead, and Zinc Mill Creek (Prado Area): Indicator Bacteria, Nutrients and Total Suspended Solids (TSS) Chino Creek, Reach 1A: Indicator Bacteria, and Nutrients Santa Ana River, Reach 3: Copper, Indicator Bacteria and Lead Santa Ana River, Reach 2: None Santa Ana River, Reach 1: None Pacific Ocean: None
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	n/a
Unlined Downstream Water Bodies *Refer to Watershed Mapping Tool – http://sbcounty.permitrack.com/WAP*	Santa Ana River
Hydrologic Conditions of Concern	☐ Yes *Complete Hydrologic Conditions of Concern (HCOC) Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-10 in submittal* ☒ No
Watershed–based BMP included in a RWQCB approved WAP	☐ Yes *Attach verification of regional BMP evaluation criteria in WAP* • *More Effective than On-site LID* • *Remaining Capacity for Project DCV* • *Upstream of any Water of the US* • *Operational at Project Completion* • *Long-Term Maintenance Plan* ☒ No

Section 4 Best Management Practices (BMP)

4.1 Source Control BMP

4.1.1 Pollution Prevention

Non-structural and structural source control BMP are required to be incorporated into all new development and significant redevelopment projects. Form 4.1-1 and 4.1-2 are used to describe specific source control BMPs used in the WQMP or to explain why a certain BMP is not applicable. Table 7-3 of the TGD for WQMP provides a list of applicable source control BMP for projects with specific types of potential pollutant sources or activities. The source control BMP in this table must be implemented for projects with these specific types of potential pollutant sources or activities.

The preparers of this WQMP have reviewed the source control BMP requirements for new development and significant redevelopment projects. The preparers have also reviewed the specific BMP required for project as specified in Forms 4.1-1 and 4.1-2. All applicable non-structural and structural source control BMP shall be implemented in the project.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N1	Education of Property Owners, Tenants and Occupants on Stormwater BMPs	☒	☐	Property owner will familiarize him/herself with the educational materials in Attachment "E" and the contents of the WQMP.
N2	Activity Restrictions	☒	☐	The owner shall develop ongoing activity restrictions that include those that have the potential to create adverse impacts on water quality. Activities include, but are not limited to: handling and disposal of contaminants, fertilizer and pesticide application restrictions, litter control and pick-up, and vehicle or equipment repair as well as any other activities that may potentially contribute to water pollution. Refer to Attachment J.
N3	Landscape Management BMPs	☒	☐	Irrigation must be consistent with City's Water Conservation Ordinance. Fertilizer and pesticide usage will be consistent with County Management Guidelines for Use of Fertilizers and Pesticides.
N4	BMP Maintenance	☒	☐	BMP maintenance, implementation schedules, and responsible parties are included with each specific BMP narrative.
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	No hazardous wastes onsite.
N6	Local Water Quality Ordinances	☒	☐	Owner/tenant will comply with Local Water Ordinances.
N7	Spill Contingency Plan	☒	☐	Owner/tenant will have a spill contingency plan, a separate document, based on specific site needs.
N8	Underground Storage Tank Compliance	☐	☒	No USTs onsite.
N9	Hazardous Materials Disclosure Compliance	☐	☒	No hazardous materials onsite.
N10	Uniform Fire Code Implementation	☒	☐	If applicable, owner will comply with Article 80 of the California Fire Code enforced by the fire protection agency. The facility operators will be educated annually regarding requirements for handling, storage and proper disposal of hazardous substances.
N11	Litter/Debris Control Program	☒	☐	Contract with their landscape maintenance firm to provide this service during regularly schedule maintenance. They are required to implement trash management and litter control procedures in the common areas aimed at reducing pollution of drainage water.
N12	Employee Training	☒	☐	The owner will ensure that tenants are also familiar with onsite BMPs and necessary maintenance required of the tenants. Owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. The WQMP requires annual employee training and new hires within 2 months.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N13	Housekeeping of Loading Docks	☒	☐	Keep all fluids indoors. Clean up spills immediately and keep spills from entering storm drain system. No direct discharges into the storm drain system. Area shall be inspected weekly for proper containment and practices with spills cleaned up immediately and disposed of properly.
N14	Catch Basin Inspection Program	☒	☐	Monthly inspection by property owner's designee. Inspection consists of immediate repair of any deterioration of the structures and maintenance of drain inserts before and after major rain events. Drain insert maintenance shall be per manufacturer's guidelines.
N15	Vacuum Sweeping of Private Streets and Parking Lots	☒	☐	All landscape maintenance contractors will be required to sweep up all landscape cuttings, mowings and fertilizer materials off paved areas weekly and dispose of properly. Parking areas and drive ways will be swept monthly by sweeping contractor.
N16	Other Non-structural Measures for Public Agency Projects	☐	☒	Not a public agency project.
N17	Comply with all other applicable NDPES permits	☒	☐	Will comply with Construction General Permit and Industrial General Permit (may apply for No Exposure Certification/NEC).

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage (CASQA New Development BMP Handbook SD-13)	☒	☐	"No Dumping – Drains to Waterway" stencils will be applied. Legibility of stencil will be maintained on a yearly basis.
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☐	☒	No outdoor material storage areas onsite.
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☒	☐	Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash. A trash enclosure detail is provided within the Site and Drainage Map.
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	☒	☐	Irrigation systems shall include reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines. Timers will be used to avoid over watering and watering cycles and duration shall be adjusted seasonally by the landscape maintenance contractor. The landscaping areas will be grouped with plants that have similar water requirements. Native or drought tolerant species shall also be used where appropriate to reduce excess irrigation runoff and promote surface filtration.
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☐	☒	Stormwater runoff from all areas will drain into the proposed infiltration facilities for treatment.
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☐	☒	No channels to protect.
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	No applicable.
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	No maintenance bays onsite.
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	No vehicle wash areas onsite.
S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	No outdoor processing areas onsite.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	No equipment wash areas onsite.
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	No fueling areas onsite.
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☐	☒	No hillsides onsite.
S14	Wash water control for food preparation areas	☐	☒	No food preparation onsite.
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	No community cars wash racks onsite.

4.1.2 Preventive LID Site Design Practices

Site design practices associated with new LID requirements in the MS4 Permit should be considered in the earliest phases of a project. Preventative site design practices can result in smaller DCV for LID BMP and hydromodification control BMP by reducing runoff generation. Describe site design and drainage plan including:

- A narrative of site design practices utilized or rationale for not using practices
- A narrative of how site plan incorporates preventive site design practices
- Include an attached Site Plan layout which shows how preventative site design practices are included in WQMP

Refer to Section 5.2 of the TGD for WQMP for more details.

Form 4.1-3 Preventive LID Site Design Practices Checklist

Site Design Practices *If yes, explain how preventative site design practice is addressed in project site plan. If no, other LID BMPs must be selected to meet targets.*
Minimize impervious areas: ☐ Yes ☒ No Explanation: Not applicable, development consists of a light industrial facility. Most areas will be paved; however, disturbed areas will be fully stabilized with landscaping and overflow runoff collected by the underground infiltration/detention chambers and biofiltration system for treatment.
Maximize natural infiltration capacity: ☒ Yes ☐ No Explanation: The proposed underground chambers will maximize natural infiltration into the subsoil below the chambers.
Preserve existing drainage patterns and time of concentration: ☒ Yes ☐ No Explanation: Post-development drainage patterns will mimic pre-development conditions. Stormwater will be retained/detained in underground facilities and mimic the time of concentration compared to existing condition.
Disconnect impervious areas: ☒ Yes ☐ No Explanation: The underground infiltration/detention chambers and biofiltration system will disconnect impervious areas before discharging offsite.
Protect existing vegetation and sensitive areas: ☐ Yes ☒ No Explanation: Not applicable, there is no existing vegetation onsite (see Attachment A for recent site photos). The site is being developed into a light industrial facility. There are no sensitive areas to protect. Landscape will be provided throughout the site.
Re-vegetate disturbed areas: ☐ Yes ☒ No Explanation: Not applicable, development consists of a light industrial facility. Most of the disturbed areas will be paved; however, disturbed areas will be landscaped with drought tolerant plants and overflow runoff collected by the underground infiltration/detention chambers and biofiltration system for treatment.
Minimize unnecessary compaction in stormwater retention/infiltration basin/trench areas: ☒ Yes ☐ No Explanation: Heavy construction vehicles will be prohibited from performing unnecessary soil compaction at the locations of the infiltration chambers.
Utilize vegetated drainage swales in place of underground piping or imperviously lined swales: ☐ Yes ☒ No Explanation: Underground piping and imperviously lined swales are located at truck loading areas that could not be substituted with vegetated swales. All Imperviously lined swales will be taken to the underground infiltration/detention chambers and biofiltration system for treatment.
Stake off areas that will be used for landscaping to minimize compaction during construction : ☒ Yes ☐ No Explanation: Landscaped areas (not located in the compacted building zone area) will be staked to minimize unnecessary compaction during construction. Material storage areas and stockpiles will be located on areas being developed into a parking lot. Access routes for heavy equipment will be located around infiltration locations.

4.2 Project Performance Criteria

The purpose of this section of the Project WQMP is to establish targets for post development hydrology based on performance criteria specified in the MS4 Permit. These targets include runoff volume for water quality control (referred to as LID design capture volume), and runoff volume, time of concentration, and peak runoff for protection of any downstream waterbody segments with a HCOC. ***If the project has more than one outlet for stormwater runoff, then complete additional versions of these forms for each DA / outlet.***

Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), the San Bernardino County Stormwater Program requires use of the P6 method (MS4 Permit Section XI.D.6a.ii) – Form 4.2-1
- For HCOC pre- and post-development hydrologic calculation, the San Bernardino County Stormwater Program requires the use of the Rational Method (San Bernardino County Hydrology Manual Section D). Forms 4.2-2 through Form 4.2-5 calculate hydrologic variables including runoff volume, time of concentration, and peak runoff from the project site pre- and post-development using the Hydrology Manual Rational Method approach. For projects greater than 640 acres (1.0 mi2), the Rational Method and these forms should not be used. For such projects, the Unit Hydrograph Method (San Bernardino County Hydrology Manual Section E) shall be applied for hydrologic calculations for HCOC performance criteria.

Refer to Section 4 in the TGD for WQMP for detailed guidance and instructions.

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 1 DMA A)

[1] **Project area (ft^2):** 169,884 (DA 1 DMA A – 3.90 ac)	[2] **Imperviousness after applying preventative site design practices (Imp%):** 95%	[3] **Runoff Coefficient (R_c):** 0.807 $R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$
[4] **Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in):** 0.534 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
[5] **Compute P6, Mean 6-hr Precipitation (inches):** 0.791 *P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
[6] **Drawdown Rate** *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
[7] **Compute design capture volume, DCV (ft^3):** 17,732 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 2 DMA A)

[1] **Project area (ft^2):** 79,715 (DA 2 DMA A – 1.83 ac)	[2] **Imperviousness after applying preventative site design practices (Imp%):** 95%	[3] **Runoff Coefficient (R_c):** 0.807 $R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$
[4] **Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in):** 0.534 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
[5] **Compute P6, Mean 6-hr Precipitation (inches):** 0.791 *P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
[6] **Drawdown Rate** *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
[7] **Compute design capture volume, DCV (ft^3):** 8,320 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 3 DMA A)

[1] **Project area (ft²):** 123,710 (DA 3 DMA A – 2.84 ac)	[2] **Imperviousness after applying preventative site design practices (Imp%):** 95%	[3] **Runoff Coefficient (R_c):** 0.807 $R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$

[4] **Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in):** 0.534
http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

[5] **Compute P6, Mean 6-hr Precipitation (inches):** 0.791

*P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1*

(Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)

[6] **Drawdown Rate** *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*	24-hrs ☐ 48-hrs ☒

[7] **Compute design capture volume, DCV (ft³):** 12,913

*DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)*

Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 3 DMA B)

[1] **Project area (ft²):** 158,994 (DA 3 DMA B – 3.65 ac)	[2] **Imperviousness after applying preventative site design practices (Imp%):** 95%	[3] **Runoff Coefficient (R_c):** 0.807 $R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$

[4] **Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in):** 0.534
http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

[5] **Compute P6, Mean 6-hr Precipitation (inches):** 0.791

*P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1*

(Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)

[6] **Drawdown Rate** *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*	24-hrs ☐ 48-hrs ☒

[7] **Compute design capture volume, DCV (ft³):** 16,595

*DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)*

Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 4 DMA A)

[1] Project area (ft^2): 1,230,134 (DA 4 DMA A – 28.24 ac)	**[2] Imperviousness after applying preventative site design practices (Imp%):** 95%	**[3] Runoff Coefficient (R_c):** 0.807 *$R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$*
[4] Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.534 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
[5] Compute P6, Mean 6-hr Precipitation (inches): 0.791 *P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1* *(Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
[6] Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
[7] Compute design capture volume, DCV (ft^3): 128,399 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		
[1] Project area (ft^2): 327,571 (DA 4 DMA A - ROW – 7.52 ac)	**[2] Imperviousness after applying preventative site design practices (Imp%):** 100%	**[3] Runoff Coefficient (R_c):** 0.892 *$R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$*
[4] Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.534 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
[5] Compute P6, Mean 6-hr Precipitation (inches): 0.791 *P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1* *(Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
[6] Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
[7] Compute design capture volume, DCV (ft^3): 37,794 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 4 DMA B)

[1] **Project area (ft^2):** 738,778 (DA 4 DMA B – 16.96 ac)	[2] **Imperviousness after applying preventative site design practices (Imp%):** 95%	[3] **Runoff Coefficient (R_c):** 0.807 $R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$

[4] **Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in):** 0.534
http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

[5] **Compute P6, Mean 6-hr Precipitation (inches):** 0.791
*P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1*
(Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)

[6] **Drawdown Rate** *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*	24-hrs ☐ 48-hrs ☒

[7] **Compute design capture volume, DCV (ft^3):** 77,112
*DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)*
Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 5 DMA A)

[1] **Project area (ft^2):** 447,361 (DA 5 DMA A – 10.27 ac)	[2] **Imperviousness after applying preventative site design practices (Imp%):** 95%	[3] **Runoff Coefficient (R_c):** 0.807 $R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$

[4] **Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in):** 0.534
http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

[5] **Compute P6, Mean 6-hr Precipitation (inches):** 0.791
*P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1*
(Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)

[6] **Drawdown Rate** *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*	24-hrs ☐ 48-hrs ☒

[7] **Compute design capture volume, DCV (ft^3):** 46,695
*DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)*
Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2

[1] **Project area (ft^2):** 323,215 (DA 5 DMA A - ROW – 7.42 ac)	[2] **Imperviousness after applying preventative site design practices (Imp%):** 100%	[3] **Runoff Coefficient (R_c):** 0.892 $R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$

[4] **Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in):** 0.534
http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

[5] **Compute P6, Mean 6-hr Precipitation (inches):** 0.791
*P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1*
(Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)

[6] Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*	24-hrs ☐ 48-hrs ☒
[7] Compute design capture volume, DCV (ft^3): 37,291 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*	

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 5 DMA B)

[1] Project area (ft^2): 564,538 (DA 5 DMA B – 12.96 ac)	**[2] Imperviousness after applying preventative site design practices (Imp%):** 95%	**[3] Runoff Coefficient (R_c):** 0.807 $R_C = 0.858(Imp\%)^3 - 0.78(Imp\%)^2 + 0.774(Imp\%) + 0.04$
[4] Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in): 0.534 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
[5] Compute P6, Mean 6-hr Precipitation (inches): 0.791 *P6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1* *(Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
[6] Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
[7] Compute design capture volume, DCV (ft^3): 58,925 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-2 Summary of HCOC Assessment

Does project have the potential to cause or contribute to an HCOC in a downstream channel: ☐ Yes ☒ No

Go to: http://sbcounty.permitrack.com/WAP/

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below (Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	[1] n/a *Form 4.2-3 Item 12*	[2] n/a *Form 4.2-4 Item 13*	[3] n/a *Form 4.2-5 Item 10*
Post-developed	[4] n/a *Form 4.2-3 Item 13*	[5] n/a *Form 4.2-4 Item 14*	[6] n/a *Form 4.2-5 Item 14*
Difference	[7] n/a *Item 4 – Item 1*	[8] n/a *Item 5 – Item 2*	[9] n/a *Item 6 – Item 3*
Difference (as % of pre-developed)	[10] n/a *Item 7 / Item 1*	[11] n/a *Item 8 / Item 2*	[12] n/a *Item 9 / Item 3*

Form 4.2-3 HCOC Assessment for Runoff Volume (DA 1)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2a Hydrologic Soil Group (HSG)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	0	0	0	0	0	0	0	0
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	0	0	0	0	0	0	0	0
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2b Hydrologic Soil Group (HSG)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	0	0	0	0	0	0	0	0
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	0	0	0	0	0	0	0	0

5 Pre-Developed area-weighted CN: 0	**7** Pre-developed soil storage capacity, S (in): 0 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 0 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 0	**8** Post-developed soil storage capacity, S (in): 0 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 0 *I_a = 0.2 * Item 8*

11 Precipitation for 2 yr, 24 hr storm (in): 0
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 0
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 0
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet HCOC Requirement, (ft^3): 0
*V_{HCOC} = (Item 13 * 0.95) – Item 12*

Form 4.2-4 HCOC Assessment for Time of Concentration (DA 1)

Compute time of concentration for pre and post developed conditions for each DA

(For projects using the Hydrology Manual complete the form below)

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	0	0	0	0	0	0	0	0
2 Change in elevation (ft)	0	0	0	0	0	0	0	0
3 Slope (ft/ft) *S_o = Item 2 / Item 1*	0	0	0	0	0	0	0	0
4 Land cover	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	0	0	0	0	0	0	0	0
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0	0	0	0	0	0	0	0
7 Cross-sectional area of channel (ft^2)	0	0	0	0	0	0	0	0
8 Wetted perimeter of channel (ft)	0	0	0	0	0	0	0	0
9 Manning's roughness of channel (n)	0	0	0	0	0	0	0	0
10 Channel flow velocity (ft/sec) *V_{fps} = (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	0	0	0	0	0	0	0	0
11 Travel time to outlet (min) *T_t = Item 6 / (Item 10 * 60)*	0	0	0	0	0	0	0	0
12 Total time of concentration (min) *T_c = Item 5 + Item 11*	0	0	0	0	0	0	0	0
13 Pre-developed time of concentration (min): 0 *Minimum of Item 12 pre-developed DMA*								
14 Post-developed time of concentration (min): 0 *Minimum of Item 12 post-developed DMA*								
15 Additional time of concentration needed to meet HCOC requirement (min): 0 *$T_{C\text{-}HCOC}$ = (Item 13 * 0.95) – Item 14*								

Form 4.2-5 HCOC Assessment for Peak Runoff (DA 1)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.6 LOG Form 4.2-4 Item 5 /60)*		0	0	0	0	0	0
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0	0	0	0	0	0
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0	0	0	0	0	0
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*		0	0	0	0	0	0
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0	0	0	0	0	0
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*		0	0	0	0	0	0
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: 0 *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for DMA B: 0 *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: 0 *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*
10 Peak runoff from pre-developed condition confluence analysis (cfs): 0 *Maximum of Item 8, 9, and 10 (including additional forms as needed)*		
11 Post-developed Q_p at T_c for DMA A: 0 *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for DMA B: 0 *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: 0 *Same as Item 10 for post-developed values*
14 Peak runoff from post-developed condition confluence analysis (cfs): 0 *Maximum of Item 11, 12, and 13 (including additional forms as needed)*		
15 Peak runoff reduction needed to meet HCOC Requirement (cfs): 0 *$Q_{p\text{-}HCOC}$ = (Item 14 * 0.95) – Item 10*		

4.3 Project Conformance Analysis

Complete the following forms for each project site DA to document that the proposed LID BMPs conform to the project DCV developed to meet performance criteria specified in the MS4 Permit (WQMP Template Section 4.2). For the LID DCV, the forms are ordered according to hierarchy of BMP selection as required by the MS4 Permit (see Section 5.3.1 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design and Hydrologic Source Controls (Form 4.3-2)
- Retention and Infiltration (Form 4.3-3)
- Harvested and Use (Form 4.3-4) or
- Biotreatment (Form 4.3-5).

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.

The first step in the analysis, using Section 5.3.2.1 of the TGD for WQMP, is to complete Forms 4.3-1 and 4.3-3) to determine if retention and infiltration BMPs are infeasible for the project. For each feasibility criterion in Form 4.3-1, if the answer is "Yes," provide all study findings that includes relevant calculations, maps, data sources, etc. used to make the determination of infeasibility.

Next, complete Forms 4.3-2 and 4.3-4 to determine the feasibility of applicable HSC and harvest and use BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.

If no site constraints exist that would limit the type of BMP to be implemented in a DA, evaluate the use of combinations of LID BMPs, including all applicable HSC BMPs to maximize on-site retention of the DCV. If no combination of BMP can mitigate the entire DCV, implement the single BMP type, or combination of BMP types, that maximizes on-site retention of the DCV within the minimum effective area.

If the combination of LID HSC, retention and infiltration, and harvest and use BMPs are unable to mitigate the entire DCV, then biotreatment BMPs may be implemented by the project proponent. If biotreatment BMPs are used, then they must be sized to provide sufficient capacity for effective treatment of the remainder of the volume-based performance criteria that cannot be achieved with LID BMPs (TGD for WQMP Section 5.4.4.2). Under no circumstances shall any portion of the DCV be released from the site without effective mitigation and/or treatment.

Form 4.3-1 Infiltration BMP Feasibility (Entire Site)

Feasibility Criterion – Complete evaluation for each DA on the Project Site	
1 Would infiltration BMP pose significant risk for groundwater related concerns? *Refer to Section 5.3.2.1 of the TGD for WQMP*	☐ Yes ☒ No
If Yes, Provide basis: (attach)	
2 Would installation of infiltration BMP significantly increase the risk of geotechnical hazards (Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert): • The location is less than 50 feet away from slopes steeper than 15 percent • The location is less than eight feet from building foundations or an alternative setback. • A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.	☐ Yes ☒ No
If Yes, Provide basis: (attach)	
3 Would infiltration of runoff on a Project site violate downstream water rights?	☐ Yes ☒ No
If Yes, Provide basis: (attach)	
4 Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils?	☐ Yes ☒ No
If Yes, Provide basis: (attach)	
5 Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)?	☐ Yes ☒ No
If Yes, Provide basis: (attach)	
6 Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? *See Section 3.5 of the TGD for WQMP and WAP*	☐ Yes ☒ No
If Yes, Provide basis: (attach)	
7 Any answer from Item 1 through Item 3 is "Yes": *If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 8 below.*	☐ Yes ☒ No
8 Any answer from Item 4 through Item 6 is "Yes": *If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.* *If no, then proceed to Item 9, below.*	☐ Yes ☒ No
9 All answers to Item 1 through Item 6 are "No": *Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.* *Proceed to Form 4.3-2, Hydrologic Source Control BMP.*	☒ Yes ☐ No

4.3.1 Site Design Hydrologic Source Control BMP

Section XI.E. of the Permit emphasizes the use of LID preventative measures; and the use of LID HSC BMPs reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable HSC shall be provided except where they are mutually exclusive with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of HSC, if a project cannot feasibly meet BMP sizing requirements or cannot fully address HCOCs, feasibility of all applicable HSC must be part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-2 to identify and calculate estimated retention volume from implementing site design HSC BMP. Refer to Section 5.4.1 in the TGD for more detailed guidance.

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: ☐ Yes ☒ No *If yes, complete Items 2-5; If no, proceed to Item 6*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)	0	0	0
3 Ratio of pervious area receiving runoff to impervious area	0	0	0
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*	0	0	0
5 Sum of retention volume achieved from impervious area dispersion (ft^3): 0 *$V_{retention}$ =Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): ☐ Yes ☒ No *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)	0	0	0
8 Ponding depth (ft)	0	0	0
9 Surface area of amended soil/gravel (ft^2)	0	0	0
10 Average depth of amended soil/gravel (ft)	0	0	0
11 Average porosity of amended soil/gravel	0	0	0
12 Retention volume achieved from on-lot infiltration (ft^3) *$V_{retention}$ = (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*	0	0	0
13 Runoff volume retention from on-lot infiltration (ft^3): 0 *$V_{retention}$ =Sum of Item 12 for all BMPs*			
14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): ☐ Yes ☒ No *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Rooftop area planned for ET BMP (ft^2)	0	0	0
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*	0	0	0
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*	0	0	0
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*	0	0	0
19 Retention Volume (ft^3) *$V_{retention}$ = Item 17 * (Item 18 / 24)*	0	0	0
20 Runoff volume retention from evapotranspiration BMPs (ft^3): 0 *$V_{retention}$ =Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: ☐ Yes ☒ No *If yes, complete Items 22-25. If no, proceed to Item 26*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA)			
22 Number of Street Trees	0	0	0
23 Average canopy cover over impervious area (ft^2)	0	0	0
24 Runoff volume retention from street trees (ft^3) *$V_{retention}$ = Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*	0	0	0
25 Runoff volume retention from street tree BMPs (ft^3): 0 *$V_{retention}$ = Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrel/cisterns: ☐ Yes ☒ No *If yes, complete Items 27-29; If no, proceed to Item 30*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
27 Number of rain barrels/cisterns	0	0	0
28 Runoff volume retention from rain barrels/cisterns (ft^3) *$V_{retention}$ = Item 27 * 3*	0	0	0
29 Runoff volume retention from residential rain barrels/Cisterns (ft^3): 0 *$V_{retention}$ =Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: 0 *Sum of Items 5, 13, 20, 25 and 29*			

4.3.2 Infiltration BMPs

Use Form 4.3-3 to compute on-site retention of runoff from proposed retention and infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction. Appendix D of the TGD for WQMP provides guidance on estimating an appropriate safety factor to use in Form 4.3-3.

If site constraints limit the use of BMPs to a single type and implementation of retention and infiltration BMPs mitigate no more than 40% of the DCV, then they are considered infeasible and the Project Proponent may evaluate the effectiveness of BMPs lower in the LID hierarchy of use (Section 5.5.1 of the TGD for WQMP)

If implementation of infiltrations BMPs is feasible as determined using Form 4.3-1, then LID infiltration BMPs shall be implemented to the MEP (section 4.1 of the TGD for WQMP).

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1 DMA A)

[1] Remaining LID DCV not met by site design HSC BMP (ft^3): 17,732
V = Form 4.2-1 Item 7 - Form 4.3-2 Item 30

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP)*	**DA 1 DMA A**	**n/a**	**n/a**
[2] Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	4.80	n/a	n/a
[3] Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.25	n/a	n/a
[4] Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	2.13	n/a	n/a
[5] Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	n/a	n/a
[6] Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	8.40' (100.8")	n/a	n/a
[7] Ponding Depth (ft) *d_{BMP} = Minimum of (1/12 * Item 4 * Item 5) or Item 6*	8.40' (100.8")	n/a	n/a
[8] Infiltrating surface area, SA (ft^2) *The lesser of the area needed for BMP infiltration of full DCV or minimum space requirements from Table 5-7 of the TGD for WQMP*	2,751	n/a	n/a
[9] Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	n/a	n/a	n/a
[10] Amended soil porosity	n/a	n/a	n/a
[11] Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.5' (6")	n/a	n/a
[12] Gravel porosity	0.40	n/a	n/a
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	n/a	n/a	n/a
[14] Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 retention * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	n/a	n/a	n/a
[15] Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	17,775 (see Attach. B for detailed calculations)	n/a	n/a

[16] Total Retention Volume from LID Infiltration BMPs (ft^3): 17,775
(Sum of Items 14 and 15 for all infiltration BMP included in plan)

[17] Fraction of DCV achieved with infiltration BMP: 100%
Retention% = Item 16 / Form 4.2-1 Item 7

[18] Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs?
☒ Yes ☐ No
If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 2 DMA A)

[1] Remaining LID DCV not met by site design HSC BMP (ft^3): 8,320
V = Form 4.2-1 Item 7 - Form 4.3-2 Item 30

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP)*	**DA 2 DMA A**	**n/a**	**n/a**
[2] Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	4.20	n/a	n/a
[3] Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.00	n/a	n/a
[4] Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	2.10	n/a	n/a
[5] Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	n/a	n/a
[6] Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	8.40' (100.8")	n/a	n/a
[7] Ponding Depth (ft) *d_{BMP} = Minimum of (1/12 * Item 4 * Item 5) or Item 6*	8.40' (100.8")	n/a	n/a
[8] Infiltrating surface area, SA (ft^2) *The lesser of the area needed for BMP infiltration of full DCV or minimum space requirements from Table 5-7 of the TGD for WQMP*	1,270	n/a	n/a
[9] Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	n/a	n/a	n/a
[10] Amended soil porosity	n/a	n/a	n/a
[11] Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.5' (6")	n/a	n/a
[12] Gravel porosity	0.40	n/a	n/a
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	n/a	n/a	n/a
[14] Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 retention * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	n/a	n/a	n/a
[15] Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	8,342 (see Attach. B for detailed calculations)	n/a	n/a

[16] Total Retention Volume from LID Infiltration BMPs (ft^3): 8,342
(Sum of Items 14 and 15 for all infiltration BMP included in plan)

[17] Fraction of DCV achieved with infiltration BMP: 100%
Retention% = Item 16 / Form 4.2-1 Item 7

[18] Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs?
☒ Yes ☐ No
If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 3 DMA A)

[1] Remaining LID DCV not met by site design HSC BMP (ft^3): 12,913
V = Form 4.2-1 Item 7 - Form 4.3-2 Item 30

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP)*	**DA 3 DMA A**	**n/a**	**n/a**
[2] Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	4.80	n/a	n/a
[3] Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.25	n/a	n/a
[4] Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	2.13	n/a	n/a
[5] Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	n/a	n/a
[6] Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	8.40' (100.8")	n/a	n/a
[7] Ponding Depth (ft) *d_{BMP} = Minimum of (1/12 * Item 4 * Item 5) or Item 6*	8.40' (100.8")	n/a	n/a
[8] Infiltrating surface area, SA (ft^2) *The lesser of the area needed for BMP infiltration of full DCV or minimum space requirements from Table 5-7 of the TGD for WQMP*	2,016	n/a	n/a
[9] Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	n/a	n/a	n/a
[10] Amended soil porosity	n/a	n/a	n/a
[11] Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.5' (6")	n/a	n/a
[12] Gravel porosity	0.40	n/a	n/a
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	n/a	n/a	n/a
[14] Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 retention * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	n/a	n/a	n/a
[15] Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	13,018 (see Attach. B for detailed calculations)	n/a	n/a

[16] Total Retention Volume from LID Infiltration BMPs (ft^3): 13,018
(Sum of Items 14 and 15 for all infiltration BMP included in plan)

[17] Fraction of DCV achieved with infiltration BMP: 100%
Retention% = Item 16 / Form 4.2-1 Item 7

[18] Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs?
☒ Yes ☐ No
If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 3 DMA B)

[1] Remaining LID DCV not met by site design HSC BMP (ft^3): 16,595
V = Form 4.2-1 Item 7 - Form 4.3-2 Item 30

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP)*	**DA 3 DMA B**	**n/a**	**n/a**
[2] Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	4.80	n/a	n/a
[3] Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.25	n/a	n/a
[4] Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	2.13	n/a	n/a
[5] Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	n/a	n/a
[6] Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	8.40' (100.8")	n/a	n/a
[7] Ponding Depth (ft) *d_{BMP} = Minimum of (1/12 * Item 4 * Item 5) or Item 6*	8.40' (100.8")	n/a	n/a
[8] Infiltrating surface area, SA (ft^2) *The lesser of the area needed for BMP infiltration of full DCV or minimum space requirements from Table 5-7 of the TGD for WQMP*	2,583	n/a	n/a
[9] Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	n/a	n/a	n/a
[10] Amended soil porosity	n/a	n/a	n/a
[11] Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.5' (6")	n/a	n/a
[12] Gravel porosity	0.40	n/a	n/a
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	n/a	n/a	n/a
[14] Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 retention * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	n/a	n/a	n/a
[15] Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	16,688 (see Attach. B for detailed calculations)	n/a	n/a

[16] Total Retention Volume from LID Infiltration BMPs (ft^3): 16,688
(Sum of Items 14 and 15 for all infiltration BMP included in plan)

[17] Fraction of DCV achieved with infiltration BMP: 100%
Retention% = Item 16 / Form 4.2-1 Item 7

[18] Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs?
☒ Yes ☐ No
If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 4 DMA A)

[1] Remaining LID DCV not met by site design HSC BMP (ft^3): 166,193
V = Form 4.2-1 Item 7 - Form 4.3-2 Item 30

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP)*	**DA 3 DMA B**	**n/a**	**n/a**
[2] Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	5.25	n/a	n/a
[3] Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.50	n/a	n/a
[4] Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	2.10	n/a	n/a
[5] Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	n/a	n/a
[6] Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	8.40' (100.8")	n/a	n/a
[7] Ponding Depth (ft) *d_{BMP} = Minimum of (1/12 * Item 4 * Item 5) or Item 6*	8.40' (100.8")	n/a	n/a
[8] Infiltrating surface area, SA (ft^2) *The lesser of the area needed for BMP infiltration of full DCV or minimum space requirements from Table 5-7 of the TGD for WQMP*	26,065	n/a	n/a
[9] Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	n/a	n/a	n/a
[10] Amended soil porosity	n/a	n/a	n/a
[11] Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.5' (6")	n/a	n/a
[12] Gravel porosity	0.40	n/a	n/a
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	n/a	n/a	n/a
[14] Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 retention * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	n/a	n/a	n/a
[15] Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	166,488 (see Attach. B for detailed calculations)	n/a	n/a

[16] Total Retention Volume from LID Infiltration BMPs (ft^3): 166,488
(Sum of Items 14 and 15 for all infiltration BMP included in plan)

[17] Fraction of DCV achieved with infiltration BMP: 100%
Retention% = Item 16 / Form 4.2-1 Item 7

[18] Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs?
☒ Yes ☐ No
If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 4 DMA B)

[1] Remaining LID DCV not met by site design HSC BMP (ft^3): 77,112
V = Form 4.2-1 Item 7 - Form 4.3-2 Item 30

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP)*	**DA 4 DMA B**	**n/a**	**n/a**
[2] Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	1.00	n/a	n/a
[3] Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.50	n/a	n/a
[4] Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	0.40	n/a	n/a
[5] Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	n/a	n/a
[6] Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	1.60' (19.2")	n/a	n/a
[7] Ponding Depth (ft) *d_{BMP} = Minimum of (1/12 * Item 4 * Item 5) or Item 6*	1.60' (19.2")	n/a	n/a
[8] Infiltrating surface area, SA (ft^2) *The lesser of the area needed for BMP infiltration of full DCV or minimum space requirements from Table 5-7 of the TGD for WQMP*	62,580	n/a	n/a
[9] Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	n/a	n/a	n/a
[10] Amended soil porosity	n/a	n/a	n/a
[11] Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	1.0' (12")	n/a	n/a
[12] Gravel porosity	0.40	n/a	n/a
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	n/a	n/a	n/a
[14] Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 retention * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	n/a	n/a	n/a
[15] Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	77,160 (see Attach. B for detailed calculations)	n/a	n/a

[16] Total Retention Volume from LID Infiltration BMPs (ft^3): 77,160
(Sum of Items 14 and 15 for all infiltration BMP included in plan)

[17] Fraction of DCV achieved with infiltration BMP: 100%
Retention% = Item 16 / Form 4.2-1 Item 7

[18] Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs?
☒ Yes ☐ No
If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 5 DMA A)

[1] Remaining LID DCV not met by site design HSC BMP (ft^3): 83,986
V = Form 4.2-1 Item 7 - Form 4.3-2 Item 30

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP)*	**DA 5 DMA A**	**n/a**	**n/a**
[2] Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	2.50	n/a	n/a
[3] Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.50	n/a	n/a
[4] Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	1.00	n/a	n/a
[5] Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	n/a	n/a
[6] Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	3.90' (46.8")	n/a	n/a
[7] Ponding Depth (ft) *d_{BMP} = Minimum of (1/12 * Item 4 * Item 5) or Item 6*	3.90' (46.8")	n/a	n/a
[8] Infiltrating surface area, SA (ft^2) *The lesser of the area needed for BMP infiltration of full DCV or minimum space requirements from Table 5-7 of the TGD for WQMP*	29,068	n/a	n/a
[9] Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	n/a	n/a	n/a
[10] Amended soil porosity	n/a	n/a	n/a
[11] Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	0.5' (6")	n/a	n/a
[12] Gravel porosity	0.40	n/a	n/a
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	n/a	n/a	n/a
[14] Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 retention * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	n/a	n/a	n/a
[15] Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	84,086 (see Attach. B for detailed calculations)	n/a	n/a

[16] Total Retention Volume from LID Infiltration BMPs (ft^3): 84,086
(Sum of Items 14 and 15 for all infiltration BMP included in plan)

[17] Fraction of DCV achieved with infiltration BMP: 100%
Retention% = Item 16 / Form 4.2-1 Item 7

[18] Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs?
☒ Yes ☐ No
If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 5 DMA B)

[1] Remaining LID DCV not met by site design HSC BMP (ft^3): 58,925
V = Form 4.2-1 Item 7 - Form 4.3-2 Item 30

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP)*	**n/a**	**n/a**	**n/a**
[2] Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	n/a	n/a	n/a
[3] Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	n/a	n/a	n/a
[4] Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	n/a	n/a	n/a
[5] Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	n/a	n/a	n/a
[6] Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	n/a	n/a	n/a
[7] Ponding Depth (ft) *d_{BMP} = Minimum of (1/12 * Item 4 * Item 5) or Item 6*	n/a	n/a	n/a
[8] Infiltrating surface area, SA (ft^2) *The lesser of the area needed for BMP infiltration of full DCV or minimum space requirements from Table 5-7 of the TGD for WQMP*	n/a	n/a	n/a
[9] Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	n/a	n/a	n/a
[10] Amended soil porosity	n/a	n/a	n/a
[11] Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	n/a	n/a	n/a
[12] Gravel porosity	n/a	n/a	n/a
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	n/a	n/a	n/a
[14] Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 retention * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	n/a	n/a	n/a
[15] Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	n/a	n/a	n/a

[16] Total Retention Volume from LID Infiltration BMPs (ft^3): 0
(Sum of Items 14 and 15 for all infiltration BMP included in plan)

[17] Fraction of DCV achieved with infiltration BMP: 0%
Retention% = Item 16 / Form 4.2-1 Item 7

[18] Is full LID DCV retained on-site with combination of hydrologic source control and LID retention and infiltration BMPs?
☒ Yes ☐ No
If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

4.3.3 Harvest and Use BMP

Harvest and use BMP may be considered if the full LID DCV cannot be met by maximizing infiltration BMPs. Use Form 4.3-4 to compute on-site retention of runoff from proposed harvest and use BMPs.

Volume retention estimates for harvest and use BMPs are sensitive to the on-site demand for captured stormwater. Since irrigation water demand is low in the wet season, when most rainfall events occur in San Bernardino County, the volume of water that can be used within a specified drawdown period is relatively low. The bottom portion of Form 4.3-4 facilitates the necessary computations to show infeasibility if a minimum incremental benefit of 40 percent of the LID DCV would not be achievable with MEP implementation of on-site harvest and use of stormwater (Section 5.5.4 of the TGD for WQMP).

Form 4.3-4 Harvest and Use BMPs

[1] **Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3):** V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16			
BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP)*	**BMP Type and DA**	**BMP Type and DA**	**BMP Type and DA**
[2] **Describe cistern or runoff detention facility**			
[3] **Storage volume for proposed detention type (ft^3)** *Volume of cistern*			
[4] **Landscaped area planned for use of harvested stormwater (ft^2)**			
[5] **Average wet season daily irrigation demand (in/day)** *Use local values, typical ~ 0.1 in/day*			
[6] **Daily water demand (ft^3/day)** *Item 4 * (Item 5 / 12)*			
[7] **Drawdown time (hrs)** *Copy Item 6 from Form 4.2-1*			
[8] **Retention Volume (ft^3)** *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*			
[9] **Total Retention Volume (ft^3) from Harvest and Use BMP:** *Sum of Item 8 for all harvest and use BMP included in plan*			
[10] **Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest and use BMPs?** ☐ Yes ☐ No *If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.*			

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration, and harvest and use BMPs. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project (see Table 5-5 of the TGD for WQMP).

Use Form 4.3-5 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV. Biotreatment computations are included as follows:

- Use Form 4.3-6 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-7 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-8 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 5 DMA B)

<table>
<tr><td colspan="2">[1] Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft³): 58,925
Form 4.2-1 Item 7 – Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9</td><td>List pollutants of concern
Copy from Form 2.3-1
Pathogens
Metals
Nitrogen</td></tr>
<tr><td rowspan="2">[2] Biotreatment BMP Selected
(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)</td><td>Volume-based biotreatment
Use Forms 4.3-6 and 4.3-7 to compute treated volume</td><td>Flow-based biotreatment
Use Form 4.3-8 to compute treated volume</td></tr>
<tr><td>☐ Bioretention with underdrain
☐ Planter box with underdrain
☐ Constructed wetlands
☐ Wet extended detention
☐ Dry extended detention
☒ Proprietary biotreatment (volume)</td><td>☐ Vegetated swale
☐ Vegetated filter strip
☐ Proprietary biotreatment</td></tr>
<tr><td>[3] Volume biotreated in volume based biotreatment BMP (ft³): 59,390
Form 4.3-6 Item 15 + Form 4.3-7 Item 13</td><td>[4] Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft³): 0
Item 1 – Item 3</td><td>[5] Remaining fraction of LID DCV for sizing flow based biotreatment BMP: n/a
Item 4 / Item 1</td></tr>
<tr><td colspan="3">[6] Flow-based biotreatment BMP capacity provided (cfs): n/a
Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)</td></tr>
<tr><td colspan="3">[7] Metrics for MEP determination:
☐ Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development:
If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.</td></tr>
</table>

Form 4.3-6 Volume Based Biotreatment – Bioretention and Planter Boxes with Underdrains (DA 5 DMA B)

BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP)*	**CMP #5B + Biofiltration DA 5 DMA B**	**BMP Type and DA**	**BMP Type and DA**
[1] Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*	*		
[2] Amended soil infiltration rate *Typical ~ 5.0 in/hr*	*		
[3] Amended soil infiltration safety factor *Typical ~ 2.0*	*		
[4] Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*	*		
[5] Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*	*		
[6] Maximum ponding depth (ft) *See Table 5-6 of the TGD for WQMP for reference to BMP design details*	*		
[7] Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*	*		
[8] Amended soil surface area (ft^2)	*		
[9] Amended soil depth (ft) *See Table 5-6 of the TGD for WQMP for reference to BMP design details*	*		
[10] Amended soil porosity, *n*	*		
[11] Gravel depth (ft) *See Table 5-6 of the TGD for WQMP for reference to BMP design details*	*		
[12] Gravel porosity, *n*	*		
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	*		
[14] Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	*429 + 58,961 = 59,390		
[15] Total biotreated volume from bioretention and/or planter box with underdrains BMP: 59,390 *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-7 Volume Based Biotreatment – Constructed Wetlands and Extended Detention

Biotreatment BMP Type *Constructed wetlands, extended wet detention, extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (e.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	**BMP Type and DA**		**BMP Type and DA**		**BMP Type and DA**	
	Forebay	**Basin**	**Forebay**	**Basin**	**Forebay**	**Basin**
[1] **Pollutants addressed with BMP forebay and basin** *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*						
[2] **Bottom width (ft)**						
[3] **Bottom length (ft)**						
[4] **Bottom area (ft^2)** *A_{bottom} = Item 2 * Item 3*						
[5] **Side slope (ft/ft)**						
[6] **Depth of storage (ft)**						
[7] **Water surface area (ft2)** *$A_{surface}$ = (Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*						
[8] **Storage volume (ft3)** *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets, see Table 5-6 of the TGD for WQMP for reference to BMP design details V =Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)$^{0.5}$]*						
[9] **Drawdown Time (hrs)** *Copy Item 6 from Form 2.1*						
[10] **Outflow rate (cfs)** *Q_{BMP} = (Item $8_{forebay}$ + Item 8_{basin}) / (Item 9 * 3600)*						
[11] **Duration of design storm event (hrs)**						
[12] **Biotreated Volume (ft^3)** *$V_{biotreated}$ = (Item $8_{forebay}$ + Item 8_{basin}) +(Item 10 * Item 11 * 3600)*						
[13] **Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention:** *(Sum of Item 12 for all BMP included in plan)*						

Form 4.3-8 Flow Based Biotreatment

Biotreatment BMP Type *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	**BMP Type and DA**	**BMP Type and DA**	**BMP Type and DA**
[1] **Pollutants addressed with BMP** *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in TGD Table 5-5*			
[2] **Flow depth for water quality treatment (ft)** *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
[3] **Bed slope (ft/ft)** *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
[4] **Manning's roughness coefficient**			
[5] **Bottom width (ft)** *b_w = (Form 4.3-5 Item 6 * Item 4) / (1.49 * Item $2^{1.67}$ * Item $3^{0.5}$)*			
[6] **Side Slope (ft/ft)** *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
[7] **Cross sectional area (ft^2)** *A = (Item 5 * Item 2) + (Item 6 * Item 2^2)*			
[8] **Water quality flow velocity (ft/sec)** *V = Form 4.3-5 Item 6 / Item 7*			
[9] **Hydraulic residence time (min)** *Pollutant specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
[10] **Length of flow based BMP (ft)** *L = Item 8 * Item 9 * 60*			
[11] **Water surface area at water quality flow depth (ft2)** *SA_{top} = (Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

4.3.5 Conformance Summary

Complete Form 4.3-9 to demonstrate how on-site LID DCV is met with proposed site design hydrologic source control, infiltration, harvest and use, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 1 DMA A)

[1] **Total LID DCV for the Project (ft^3):** 17,732
Copy Item 7 in Form 4.2-1

[2] **On-site retention with site design hydrologic source control LID BMP (ft^3):** 0
Copy Item 30 in Form 4.3-2

[3] **On-site retention with LID infiltration BMP (ft^3):** 17,775
Copy Item 16 in Form 4.3-3

[4] **On-site retention with LID harvest and use BMP (ft^3):** 0
Copy Item 9 in Form 4.3-4

[5] **On-site biotreatment with volume based biotreatment BMP (ft^3):** 0
Copy Item 3 in Form 4.3-5

[6] **Flow capacity provided by flow based biotreatment BMP (cfs):** 0
Copy Item 6 in Form 4.3-5

[7] **LID BMP performance criteria are achieved if answer to any of the following is "Yes":**

- **Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP:** ☒Yes ☐No
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- **Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV:** ☐Yes ☒No
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- **On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV:** ☐Yes ☒No
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

[8] **If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:**

☐ **Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture.**
Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

☐ **An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility.**
Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 2 DMA A)

[1] Total LID DCV for the Project (ft^3): 8,320
Copy Item 7 in Form 4.2-1

[2] On-site retention with site design hydrologic source control LID BMP (ft^3): 0
Copy Item 30 in Form 4.3-2

[3] On-site retention with LID infiltration BMP (ft^3): 8,342
Copy Item 16 in Form 4.3-3

[4] On-site retention with LID harvest and use BMP (ft^3): 0
Copy Item 9 in Form 4.3-4

[5] On-site biotreatment with volume based biotreatment BMP (ft^3): 0
Copy Item 3 in Form 4.3-5

[6] Flow capacity provided by flow based biotreatment BMP (cfs): 0
Copy Item 6 in Form 4.3-5

[7] LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- **Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP:** ☒Yes ☐No
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- **Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV:** ☐Yes ☒No
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- **On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV:** ☐Yes ☒No
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

[8] If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

☐ **Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture.**
Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

☐ **An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility.**
Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 3 DMA A)

[1] Total LID DCV for the Project (ft^3): 12,913
Copy Item 7 in Form 4.2-1

[2] On-site retention with site design hydrologic source control LID BMP (ft^3): 0
Copy Item 30 in Form 4.3-2

[3] On-site retention with LID infiltration BMP (ft^3): 13,018
Copy Item 16 in Form 4.3-3

[4] On-site retention with LID harvest and use BMP (ft^3): 0
Copy Item 9 in Form 4.3-4

[5] On-site biotreatment with volume based biotreatment BMP (ft^3): 0
Copy Item 3 in Form 4.3-5

[6] Flow capacity provided by flow based biotreatment BMP (cfs): 0
Copy Item 6 in Form 4.3-5

[7] LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- **Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP:** ☒Yes ☐No
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- **Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV:** ☐Yes ☒No
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- **On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV:** ☐Yes ☒No
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

[8] If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

☐ **Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture.**
Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

☐ **An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility.**
Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 3 DMA B)

[1] Total LID DCV for the Project (ft^3): 16,595
Copy Item 7 in Form 4.2-1

[2] On-site retention with site design hydrologic source control LID BMP (ft^3): 0
Copy Item 30 in Form 4.3-2

[3] On-site retention with LID infiltration BMP (ft^3): 16,688
Copy Item 16 in Form 4.3-3

[4] On-site retention with LID harvest and use BMP (ft^3): 0
Copy Item 9 in Form 4.3-4

[5] On-site biotreatment with volume based biotreatment BMP (ft^3): 0
Copy Item 3 in Form 4.3-5

[6] Flow capacity provided by flow based biotreatment BMP (cfs): 0
Copy Item 6 in Form 4.3-5

[7] LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- **Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP:** ☒Yes ☐No
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- **Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV:** ☐Yes ☒No
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- **On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV:** ☐Yes ☒No
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

[8] If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

☐ **Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture.**
Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

☐ **An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility.**
Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 4 DMA A)

[1] Total LID DCV for the Project (ft^3): 166,193
Copy Item 7 in Form 4.2-1

[2] On-site retention with site design hydrologic source control LID BMP (ft^3): 0
Copy Item 30 in Form 4.3-2

[3] On-site retention with LID infiltration BMP (ft^3): 166,488
Copy Item 16 in Form 4.3-3

[4] On-site retention with LID harvest and use BMP (ft^3): 0
Copy Item 9 in Form 4.3-4

[5] On-site biotreatment with volume based biotreatment BMP (ft^3): 0
Copy Item 3 in Form 4.3-5

[6] Flow capacity provided by flow based biotreatment BMP (cfs): 0
Copy Item 6 in Form 4.3-5

[7] LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- **Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP:** ☒Yes ☐No
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- **Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV:** ☐Yes ☒No
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- **On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV:** ☐Yes ☒No
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

[8] If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

☐ **Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture.**
Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

☐ **An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility.**
Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 4 DMA B)

[1] Total LID DCV for the Project (ft^3): 77,112
Copy Item 7 in Form 4.2-1

[2] On-site retention with site design hydrologic source control LID BMP (ft^3): 0
Copy Item 30 in Form 4.3-2

[3] On-site retention with LID infiltration BMP (ft^3): 77,160
Copy Item 16 in Form 4.3-3

[4] On-site retention with LID harvest and use BMP (ft^3): 0
Copy Item 9 in Form 4.3-4

[5] On-site biotreatment with volume based biotreatment BMP (ft^3): 0
Copy Item 3 in Form 4.3-5

[6] Flow capacity provided by flow based biotreatment BMP (cfs): 0
Copy Item 6 in Form 4.3-5

[7] LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- **Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP:** ☒Yes ☐No
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- **Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV:** ☐Yes ☒No
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- **On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV:** ☐Yes ☒No
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

[8] If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

☐ **Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture.**
Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

☐ **An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility.**
Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 5 DMA A)

[1] Total LID DCV for the Project (ft^3): 83,986
Copy Item 7 in Form 4.2-1

[2] On-site retention with site design hydrologic source control LID BMP (ft^3): 0
Copy Item 30 in Form 4.3-2

[3] On-site retention with LID infiltration BMP (ft^3): 84,086
Copy Item 16 in Form 4.3-3

[4] On-site retention with LID harvest and use BMP (ft^3): 0
Copy Item 9 in Form 4.3-4

[5] On-site biotreatment with volume based biotreatment BMP (ft^3): 0
Copy Item 3 in Form 4.3-5

[6] Flow capacity provided by flow based biotreatment BMP (cfs): 0
Copy Item 6 in Form 4.3-5

[7] LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- **Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP:** ☒Yes ☐No
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- **Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV:** ☐Yes ☒No
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- **On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV:** ☐Yes ☒No
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

[8] If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

☐ **Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture.**
Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

☐ **An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility.**
Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 5 DMA B)

[1] Total LID DCV for the Project (ft^3): 58,925
Copy Item 7 in Form 4.2-1

[2] On-site retention with site design hydrologic source control LID BMP (ft^3): 0
Copy Item 30 in Form 4.3-2

[3] On-site retention with LID infiltration BMP (ft^3): 0
Copy Item 16 in Form 4.3-3

[4] On-site retention with LID harvest and use BMP (ft^3): 0
Copy Item 9 in Form 4.3-4

[5] On-site biotreatment with volume based biotreatment BMP (ft^3): 59,390
Copy Item 3 in Form 4.3-5

[6] Flow capacity provided by flow based biotreatment BMP (cfs): 0
Copy Item 6 in Form 4.3-5

[7] LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- **Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP:** ☐Yes ☒No
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- **Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV:** ☐Yes ☒No
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- **On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV:** ☒Yes ☐No
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

[8] If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

☐ **Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture.**
Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*

☐ **An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility.**
Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

4.3.6 Hydromodification Control BMP

Use Form 4.3-10 to compute the remaining runoff volume retention, after LID BMP are implemented, needed to address HCOC, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential HCOC. Describe hydromodification control BMP that address HCOC, which may include off-site BMP and/or in-stream controls. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-10 Hydromodification Control BMPs (DA 1)

[1] **Volume reduction needed for HCOC performance criteria (ft^3):** *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	[2] **On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3):** *Sum of Form 4.3-9 Items 2, 3, and 4. Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*
[3] **Remaining volume for HCOC volume capture (ft^3):** *Item 1 – Item 2*	[4] **Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3):** *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

[5] **If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification** ☐
Attach in-stream control BMP selection and evaluation to this WQMP

[6] **Is Form 4.2-2 Item 11 less than or equal to 5%:** ☐Yes ☐No
If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

☐ **Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP.**
BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)

☐ **Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities.**

- ☐ **Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California.**

[7] **Form 4.2-2 Item 12 less than or equal to 5%:** ☐Yes ☐No
If yes, HCOC performance criteria are achieved. If no, select one or more mitigation options below:

☐ **Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs.**
BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)

- ☐ **Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California.**

4.4 Alternative Compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, harvest and use, or biotreat the DCV via on-site LID practices. A project proponent must develop an alternative compliance plan to address the remainder of the LID DCV. Depending on project type some projects may qualify for water quality credits that can be applied to reduce the DCV that must be treated prior to development of an alternative compliance plan (see Form 2.4-1, Water Quality Credits). Form 4.3-9 Item 8 includes instructions on how to apply water quality credits when computing the DCV that must be met through alternative compliance. Alternative compliance plans may include one or more of the following elements:

- On-site structural treatment control BMP - All treatment control BMP should be located as close to possible to the pollutant sources and should not be located within receiving waters;
- Off-site structural treatment control BMP - Pollutant removal should occur prior to discharge of runoff to receiving waters;
- Urban runoff fund or In-lieu program, if available

Depending upon the proposed alternative compliance plan, approval by the executive officer may or may not be required (see Section 6 of the TGD for WQMP).

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMP included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance (refer to Section 8, Post Construction BMP Requirements, in the TGD for WQMP). Fully complete Form 5-1 summarizing all BMP included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMP and may require a Maintenance Agreement (consult the jurisdiction's LIP). If a Maintenance Agreement is required, it must also be attached to the WQMP.

Form 5-1 BMP Inspection and Maintenance

BMP	Responsible Party(ies)	Inspection/Maintenance Activities Required	Minimum Frequency of Activities
Contech CMP Underground System	Owner	Contech recommends ongoing quarterly inspections of the accumulated sediment. All systems shall be designed with an access/inspection manhole situated at or near the inlet and the outlet orifice. Maintaining the system should be scheduled during dry weather.	Inspections shall be done quarterly. Maintenance shall be scheduled when accumulated sediment or trash is clogging the discharge orifice.
Proprietary Biofiltration System	Owner	Remove trash from Screening Device, sediment from Separation Chamber and replace cartridge Filter Media, and Drain Down Filter Media. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.	Average maintenance interval of 6 to 12 months for removing trash from Screening Device. Average interval of 12 to 24 months for removing sediment, replacing Cartridge Filter Media, replacing Drain Down Filter Media and trimming vegetation.
Drain Inserts	Owner	Visually inspect for defects and illegal dumping. Notify proper authorities if illegal dumping has occurred. Using an industrial vacuum, the collected materials shall be removed from the filter basket and disposed of properly. Inspect biosorb hydrocarbon boom and replace as necessary.	Four times per year or following any rain event that would potentially accumulate a large amount of debris in the system. Replace boom twice per year, at a minimum.
Storm Drain Stenciled Message	Owner	Visually inspect for legibility and replace or repaint as necessary.	Annually
N1: Education of Property Owners, Tenants and Occupants on Stormwater BMPs	Owner	Property owner will familiarize him/herself with the educational materials in Attachment "E" and the contents of the WQMP.	Annually (January) for all employees and within 2 months for new hires.

Form 5-1 BMP Inspection and Maintenance

N2: Activity Restrictions	Owner	Activities are restricted to only those for which a BMP has been implemented. The owner shall develop ongoing activity restrictions that include those that have the potential to create adverse impacts on water quality. Activities include, but are not limited to: handling and disposal of contaminants, fertilizer and pesticide application restrictions, litter control and pick-up, and vehicle or equipment repair as well as any other activities that may potentially contribute to water pollution.	Ongoing
N3: Landscape Management BMPs	Owner	Irrigation must be consistent with City's Water Conservation Ordinance. Fertilizer and pesticide usage will be consistent with County Management Guidelines for Use of Fertilizers and Pesticides.	Ongoing
N4: BMP Maintenance	Owner	BMP maintenance, implementation schedules, and responsible parties are included with each specific BMP narrative.	As described in each BMP listed within this form.
N7: Spill Contingency Plan	Owner	Owner/tenant will have a spill contingency plan, a separate document, based on specific site needs.	Ongoing
N10: Uniform Fire Code Implementation	Owner	If applicable, owner will comply with Article 80 of the Uniform Fire Code enforced by the fire protection agency. The facility operators will be educated annually regarding requirements for handling, storage and proper disposal of hazardous substances.	Ongoing
N11: Litter/Debris Control Program	Owner	Contract with their landscape maintenance firm to provide this service during regularly schedule maintenance. They are required to implement trash management and litter control procedures in the common areas aimed at reducing pollution of drainage water.	Weekly
N12: Employee Training	Owner	The owner will ensure that tenants are also familiar with onsite BMPs and necessary maintenance required of the tenants. Owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. The WQMP requires annual employee training and new hires within 2 months.	Annually (January) for all employees and within 2 months for new hires.
N13: Housekeeping of Loading Docks	Owner	Keep all fluids indoors. Clean up spills immediately and keep spills from entering storm drain system. No direct discharges into the storm drain system. Area shall be inspected weekly for proper containment and practices with spills cleaned up immediately and disposed of properly.	Ongoing
N14: Catch Basin Inspection Program	Owner	Monthly inspection by property owner's designee. Inspection consists of immediate repair of any deterioration of the structures and maintenance of drain inserts before and after major rain events. Drain insert maintenance shall be per manufacturer's guidelines.	Monthly inspection and maintain as necessary.

Form 5-1 BMP Inspection and Maintenance			
N15: Vacuum Sweeping of Private Streets and Parking Lots	Owner	All landscape maintenance contractors will be required to sweep up all landscape cuttings, mowings and fertilizer materials off paved areas weekly and dispose of properly. Parking areas and drive ways will be swept monthly by sweeping contractor.	Monthly
N17: Comply with all other applicable NPDES permits	Owner	Will comply with Construction General Permit and Industrial General Permit (may apply for No Exposure Certification/NEC).	Ongoing
S1: Provide storm drain system stenciling and signage (CASQA New Development BMP Handbook SD-13)	Owner	"No Dumping – Drains to River" stencils will be applied. Legibility of stencil will be maintained on a yearly basis.	Annually (January)
S3: Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	Owner	Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash. Detail to be provided once available.	Ongoing
S4: Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	Owner	Irrigation systems shall include reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines. Timers will be used to avoid over watering and watering cycles and duration shall be adjusted seasonally by the landscape maintenance contractor. The landscaping areas will be grouped with plants that have similar water requirements. Native or drought tolerant species shall also be used where appropriate to reduce excess irrigation runoff and promote surface filtration.	Adjust watering cycles and duration seasonally / quarterly (Oct, Jan, Apr, and Jul).

Section 6 WQMP Attachments

6.1 Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections

See Attachment C for Site and Drainage Plan.

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (consult the LIP), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

6.3 Post Construction

Attach all O&M Plans and Memorandum of Agreement for BMP to the WQMP (Attachment D).

6.4 Other Supporting Documentation

- BMP Educational Materials (Attachment E)
- Soil/Infiltration Report (Attachment F)
- BMP Maintenance Material (Attachment G)
- Conditions of Approval (Attachment H)
- Class V Injection Well Registration (Attachment I)
- Activity Restrictions (Attachment J)
- Excerpt of Subsurface Investigation Report (Attachment K)

Attachment A
Existing Condition Site Photos









Attachment B
BMP Design Calculations & Supporting Documentation

General Information
Homepage
Progress Reports
FAQ
Glossary

Precipitation Frequency
Data Server
GIS Grids
Maps
Time Series
Temporals
Documents

Probable Maximum Precipitation
Documents

Miscellaneous
Publications
Storm Analysis
Record Precipitation

Contact Us
Inquiries

NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

Data description

Data type: Precipitation depth | Units: English | Time series type: Partial duration

Select location

1) Manually:

a) By location (decimal degrees, use "-" for S and W): Latitude: 34.095065 Longitude: -117.53340 Submit

b) By station (list of CA stations): Select station

c) By address: Search

2) Use map (if ESRI interactive map is not loading, try adding the host: **https://js.arcgis.com/** to the firewall, or contact us at hdsc.questions@noaa.gov):



POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 6, Version 2

PF tabular | PF graphical | Supplementary information

Print page

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.109** (0.091-0.132)	**0.143** (0.119-0.174)	**0.189** (0.157-0.231)	**0.228** (0.188-0.280)	**0.281** (0.224-0.358)	**0.324** (0.252-0.420)	**0.367** (0.279-0.489)	**0.414** (0.305-0.567)	**0.478** (0.337-0.684)	**0.530** (0.361-0.786)
10-min	**0.156** (0.130-0.189)	**0.205** (0.171-0.249)	**0.272** (0.225-0.331)	**0.327** (0.269-0.401)	**0.403** (0.321-0.513)	**0.464** (0.361-0.602)	**0.527** (0.399-0.701)	**0.593** (0.437-0.813)	**0.685** (0.484-0.981)	**0.759** (0.517-1.13)
15-min	**0.188** (0.157-0.228)	**0.248** (0.207-0.301)	**0.328** (0.273-0.400)	**0.395** (0.325-0.485)	**0.488** (0.388-0.620)	**0.561** (0.436-0.728)	**0.637** (0.483-0.848)	**0.717** (0.528-0.983)	**0.829** (0.585-1.19)	**0.918** (0.625-1.36)
30-min	**0.277** (0.231-0.336)	**0.365** (0.304-0.443)	**0.483** (0.401-0.588)	**0.581** (0.478-0.713)	**0.717** (0.570-0.912)	**0.825** (0.642-1.07)	**0.937** (0.710-1.25)	**1.05** (0.777-1.45)	**1.22** (0.860-1.75)	**1.35** (0.920-2.00)
60-min	**0.405** (0.338-0.491)	**0.534** (0.445-0.648)	**0.707** (0.586-0.860)	**0.850** (0.699-1.04)	**1.05** (0.834-1.33)	**1.21** (0.938-1.57)	**1.37** (1.04-1.82)	**1.54** (1.14-2.11)	**1.78** (1.26-2.55)	**1.98** (1.35-2.93)
2-hr	**0.619** (0.516-0.750)	**0.800** (0.666-0.971)	**1.04** (0.863-1.26)	**1.24** (1.02-1.52)	**1.51** (1.20-1.92)	**1.73** (1.34-2.24)	**1.95** (1.48-2.59)	**2.18** (1.61-2.99)	**2.50** (1.77-3.58)	**2.76** (1.88-4.09)
3-hr	**0.792** (0.660-0.959)	**1.02** (0.846-1.23)	**1.31** (1.09-1.60)	**1.55** (1.28-1.91)	**1.89** (1.50-2.40)	**2.15** (1.67-2.79)	**2.41** (1.83-3.21)	**2.69** (1.98-3.69)	**3.07** (2.17-4.40)	**3.38** (2.30-5.01)
6-hr	**1.14** (0.950-1.38)	**1.46** (1.22-1.77)	**1.88** (1.56-2.28)	**2.21** (1.82-2.72)	**2.67** (2.12-3.39)	**3.01** (2.34-3.91)	**3.36** (2.55-4.48)	**3.72** (2.74-5.11)	**4.21** (2.97-6.03)	**4.59** (3.13-6.81)
12-hr	**1.52** (1.26-1.84)	**1.97** (1.64-2.39)	**2.54** (2.11-3.09)	**2.99** (2.46-3.67)	**3.58** (2.84-4.55)	**4.02** (3.13-5.22)	**4.45** (3.38-5.93)	**4.89** (3.60-6.70)	**5.46** (3.86-7.82)	**5.90** (4.01-8.75)

24-hr	**2.04** (1.80-2.35)	**2.70** (2.38-3.11)	**3.52** (3.10-4.07)	**4.16** (3.64-4.85)	**4.99** (4.22-6.01)	**5.59** (4.64-6.88)	**6.18** (5.01-7.79)	**6.77** (5.33-8.76)	**7.52** (5.69-10.1)	**8.08** (5.91-11.3)
2-day	**2.51** (2.22-2.89)	**3.40** (3.01-3.92)	**4.54** (4.00-5.25)	**5.44** (4.76-6.34)	**6.63** (5.61-7.99)	**7.52** (6.24-9.25)	**8.40** (6.80-10.6)	**9.29** (7.32-12.0)	**10.5** (7.91-14.1)	**11.3** (8.30-15.8)
3-day	**2.74** (2.42-3.15)	**3.77** (3.33-4.35)	**5.11** (4.50-5.91)	**6.19** (5.42-7.22)	**7.65** (6.48-9.22)	**8.77** (7.28-10.8)	**9.90** (8.02-12.5)	**11.1** (8.71-14.3)	**12.6** (9.55-17.0)	**13.8** (10.1-19.3)
4-day	**2.99** (2.65-3.45)	**4.15** (3.67-4.79)	**5.68** (5.01-6.57)	**6.93** (6.06-8.08)	**8.63** (7.31-10.4)	**9.95** (8.25-12.2)	**11.3** (9.15-14.2)	**12.7** (9.99-16.4)	**14.6** (11.0-19.7)	**16.1** (11.7-22.4)
7-day	**3.49** (3.09-4.03)	**4.89** (4.33-5.64)	**6.74** (5.95-7.80)	**8.27** (7.24-9.65)	**10.4** (8.78-12.5)	**12.0** (9.96-14.8)	**13.7** (11.1-17.3)	**15.5** (12.2-20.0)	**17.9** (13.5-24.1)	**19.8** (14.5-27.6)
10-day	**3.79** (3.36-4.37)	**5.33** (4.72-6.15)	**7.39** (6.51-8.55)	**9.09** (7.95-10.6)	**11.4** (9.69-13.8)	**13.3** (11.0-16.4)	**15.2** (12.3-19.2)	**17.2** (13.6-22.3)	**20.0** (15.1-26.9)	**22.2** (16.2-30.9)
20-day	**4.39** (3.89-5.06)	**6.27** (5.55-7.24)	**8.82** (7.78-10.2)	**11.0** (9.58-12.8)	**13.9** (11.8-16.8)	**16.3** (13.5-20.1)	**18.8** (15.2-23.7)	**21.4** (16.9-27.8)	**25.1** (19.0-33.9)	**28.1** (20.6-39.2)
30-day	**5.18** (4.59-5.97)	**7.44** (6.58-8.59)	**10.5** (9.28-12.2)	**13.1** (11.5-15.3)	**16.8** (14.2-20.3)	**19.8** (16.4-24.3)	**22.9** (18.5-28.8)	**26.2** (20.7-33.9)	**30.9** (23.4-41.7)	**34.7** (25.4-48.4)
45-day	**6.14** (5.44-7.08)	**8.81** (7.79-10.2)	**12.5** (11.0-14.4)	**15.6** (13.7-18.2)	**20.1** (17.0-24.2)	**23.7** (19.7-29.2)	**27.5** (22.3-34.7)	**31.7** (24.9-41.0)	**37.5** (28.4-50.6)	**42.4** (31.0-59.1)
60-day	**7.14** (6.32-8.23)	**10.2** (8.99-11.7)	**14.4** (12.7-16.6)	**18.0** (15.7-21.0)	**23.1** (19.6-27.9)	**27.3** (22.7-33.6)	**31.8** (25.8-40.1)	**36.7** (28.9-47.5)	**43.7** (33.0-58.9)	**49.4** (36.1-68.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Estimates from the table in CSV format: Precipitation frequency estimates Submit

Main Link Categories:
Home | OWP

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Office of Water Prediction (OWP)
1325 East West Highway
Silver Spring, MD 20910
Page Author: HDSC webmaster
Page last modified: April 21, 2017

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Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet
DA 1 DMA A, DA 3 DMA A & DA 3 DMA B

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	2	0.50
		Level of pretreatment/ expected sediment loads	0.25	3	0.75
		Redundancy	0.25	3	0.75
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.25
Combined Safety Factor, $S_{TOT} = S_A \times S_B$					2.25
Measured Infiltration Rate, inch/hr, K_M (corrected for test-specific bias)					4.80
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_M / S_{TOT}$					2.13

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

A site-specific infiltration test will be conducted at the location of the infiltration facility to support a minimum measured infiltration result of 4.80 in/hr. The design infiltration rate is 2.13 in/hr after applying the appropriate safety factor. This design rate is suitable for infiltration facilities.

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet
DA 2 DMA A

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	1	0.25
		Level of pretreatment/ expected sediment loads	0.25	3	0.75
		Redundancy	0.25	3	0.75
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.0

Combined Safety Factor, $S_{TOT} = S_A \times S_B$	2.0
Measured Infiltration Rate, inch/hr, K_M (corrected for test-specific bias)	4.20
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_M / S_{TOT}$	2.10

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

A site-specific infiltration test will be conducted at the location of the infiltration facility to support a minimum measured infiltration result of 4.20 in/hr. The design infiltration rate is 2.10 in/hr after applying the appropriate safety factor. This design rate is suitable for infiltration facilities.

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet
DA 4 DMA A

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3	0.75
		Level of pretreatment/ expected sediment loads	0.25	3	0.75
		Redundancy	0.25	3	0.75
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.50

Combined Safety Factor, $S_{TOT} = S_A \times S_B$	2.50
Measured Infiltration Rate, inch/hr, K_M (corrected for test-specific bias)	5.25
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_M / S_{TOT}$	2.10

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

A site-specific infiltration test will be conducted at the location of the infiltration facility to support a minimum measured infiltration result of 5.25 in/hr. The design infiltration rate is 2.10 in/hr after applying the appropriate safety factor. This design rate is suitable for infiltration facilities.

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet
DA 4 DMA B

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3	0.75
		Level of pretreatment/ expected sediment loads	0.25	3	0.75
		Redundancy	0.25	3	0.75
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.50

Combined Safety Factor, $S_{TOT} = S_A \times S_B$	2.50
Measured Infiltration Rate, inch/hr, K_M (corrected for test-specific bias)	1.0
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_M / S_{TOT}$	0.4

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

A site-specific infiltration test has been conducted at the location of the infiltration facility to support a minimum measured infiltration result of 1.0 in/hr. The design infiltration rate is 0.4 in/hr after applying the appropriate safety factor. This design rate is suitable for infiltration facilities.

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet
DA 5 DMA A

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Tributary area size	0.25	3	0.75
		Level of pretreatment/ expected sediment loads	0.25	3	0.75
		Redundancy	0.25	3	0.75
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			2.50

Combined Safety Factor, $S_{TOT} = S_A \times S_B$	2.50
Measured Infiltration Rate, inch/hr, K_M (corrected for test-specific bias)	2.5
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_M / S_{TOT}$	1.0

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

A site-specific infiltration test has been conducted at the project site to support a minimum measured infiltration result of 2.5 in/hr. The design infiltration rate is 1.0 in/hr after applying the appropriate safety factor. This design rate is suitable for infiltration facilities.

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

VOLUME-BASED BMP DESIGN

$C_{BMP} = 0.858(imp)^3 - 0.78(imp)^2 + 0.774(imp) + 0.04$
P6 = (0.534)(1.4807) = 0.791 inches
P0 = (1.963)(C_{BMP})(0.791)
DCV = (P0 * Area) / 12

DA 1 DMA A – CONTECH PERFORATED CMP #1

Region		Valley	
Drainage Area (acres)		3.90	acres
Drainage Area (sq-ft)		169,884	sq-ft
Impervious Coeff	i =	0.95	< 1.0
Runoff Coeff	**C =**	0.807	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		17,732	cu-ft
DCV		0.407	acre-ft

Assumed design infiltration rate = 2.13 in/hr
d_{max} = 102.24 inches = Design infiltration rate x 48 hours = 2.13 in/hr x 48 hrs
d_{BMP} = 100.8 inches = [(6 inches + 6 inches) x 0.40] + 96 inches
$d_{max} > d_{BMP}$

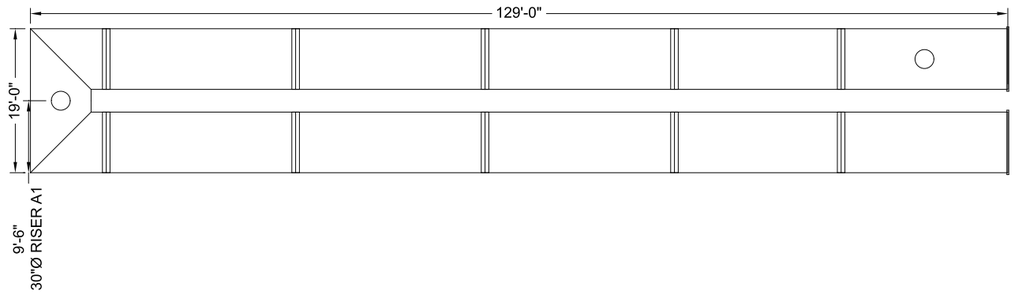
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 261 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 17,732 CF
- PIPE STORAGE VOLUME = 13,119 CF
- BACKFILL STORAGE VOLUME = 4,656 CF
- TOTAL STORAGE PROVIDED = 17,775 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY
SCALE: 1" = 20'

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CONTECH® CMP DETENTION SYSTEMS
CONTECH **DYODS** DRAWING

YO30696 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 1 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
20705	30696	5/2/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

DA 2 DMA A – CONTECH PERFORATED CMP #2

Region		Valley	
Drainage Area (acres)		1.83	acres
Drainage Area (sq-ft)		79,715	sq-ft
Impervious Coeff	i =	0.95	< 1.0
Runoff Coeff	**C =**	0.807	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		8,320	cu-ft
DCV		0.191	acre-ft

Assumed design infiltration rate = 2.10 in/hr

d_{max} = 100.8 inches = Design infiltration rate x 48 hours = 2.10 in/hr x 48 hrs

d_{BMP} = 100.8 inches = [(6 inches + 6 inches) x 0.40] + 96 inches

$d_{max} > d_{BMP}$

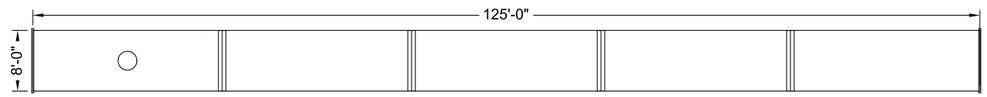
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 125 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 8,320 CF
- PIPE STORAGE VOLUME = 6,283 CF
- BACKFILL STORAGE VOLUME = 2,059 CF
- TOTAL STORAGE PROVIDED = 8,342 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY
SCALE: 1" = 20'

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CONTECH® CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

DYO30702 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 2 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
20705	30702	4/26/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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DA 3 DMA A – CONTECH PERFORATED CMP #3A

Region		Valley	
Drainage Area (acres)		2.84	acres
Drainage Area (sq-ft)		123,710	sq-ft
Impervious Coeff	i =	0.95	< 1.0
Runoff Coeff	**C =**	0.807	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		12,913	cu-ft
DCV		0.296	acre-ft

Assumed design infiltration rate = 2.13 in/hr

d_{max} = 102.24 inches = Design infiltration rate x 48 hours = 2.13 in/hr x 48 hrs

d_{BMP} = 100.8 inches = [(6 inches + 6 inches) x 0.40] + 96 inches

$d_{max} > d_{BMP}$

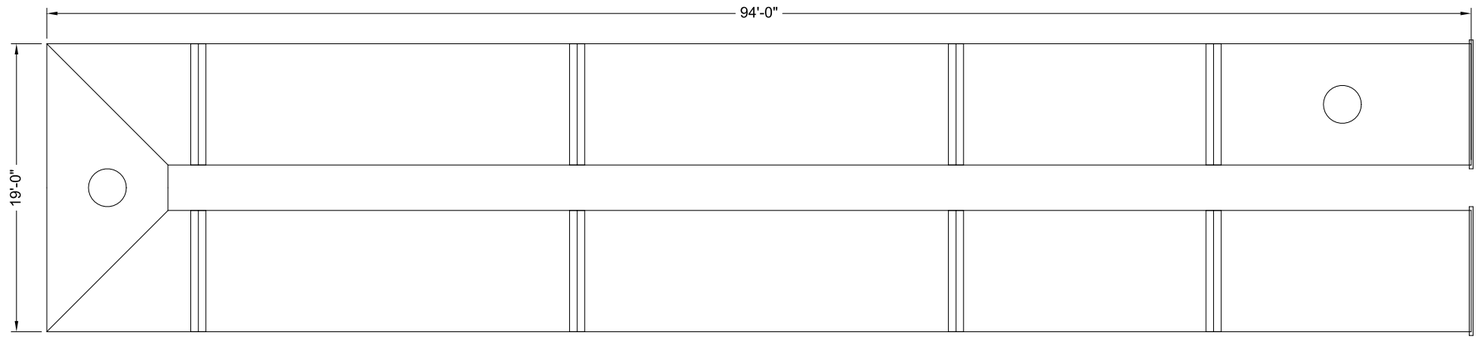
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 191 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 12,913 CF
- PIPE STORAGE VOLUME = 9,601 CF
- BACKFILL STORAGE VOLUME = 3,417 CF
- TOTAL STORAGE PROVIDED = 13,018 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



ASSEMBLY
SCALE: 1" = 10'

NOTES

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- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
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CONTECH DYODS DRAWING

DYO30703 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 3 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
20705	30703	5/2/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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DA 3 DMA B – CONTECH PERFORATED CMP #3B

Region		Valley	
Drainage Area (acres)		3.65	acres
Drainage Area (sq-ft)		158,994	sq-ft
Impervious Coeff	i =	0.95	< 1.0
Runoff Coeff	**C =**	0.807	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		16,595	cu-ft
DCV		0.381	acre-ft

Assumed design infiltration rate = 2.13 in/hr

d_{max} = 102.24 inches = Design infiltration rate x 48 hours = 2.13 in/hr x 48 hrs

d_{BMP} = 100.8 inches = [(6 inches + 6 inches) x 0.40] + 96 inches

$d_{max} > d_{BMP}$

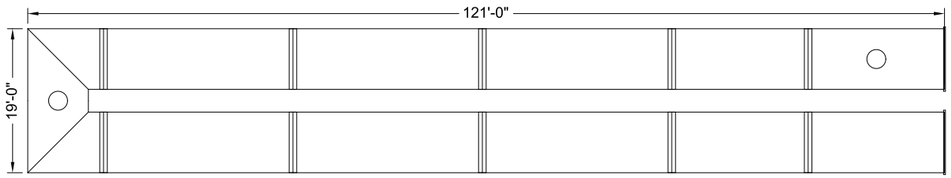
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 245 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 16,595 CF
- PIPE STORAGE VOLUME = 12,315 CF
- BACKFILL STORAGE VOLUME = 4,373 CF
- TOTAL STORAGE PROVIDED = 16,688 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

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- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
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ASSEMBLY
SCALE: 1" = 20'

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CONTECH DYODS DRAWING

YO30706 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 3 DMA B
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
20705	30706	4/24/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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DA 4 DMA A – CONTECH PERFORATED CMP #4A

Region		Valley	
Drainage Area (acres)		28.24	acres
Drainage Area (sq-ft)		1,230,134	sq-ft
Impervious Coeff	i =	0.95	< 1.0
Runoff Coeff	**C =**	0.807	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		128,399	cu-ft
DCV		2.948	acre-ft

ROW IMPROVEMENTS – CONTECH PERFORATED CMP #4A

Region		Valley	
Drainage Area (acres)		7.52	acres
Drainage Area (sq-ft)		327,571	sq-ft
Impervious Coeff	i =	1	< 1.0
Runoff Coeff	**C =**	0.892	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		37,794	cu-ft
DCV		0.868	acre-ft

Total DCV = 128,399 cu-ft + 37,794 cu-ft = 166,193 cu-ft

Assumed design infiltration rate = 2.10 in/hr

d_{max} = 100.8 inches = Design infiltration rate x 48 hours = 2.10 in/hr x 48 hrs

d_{BMP} = 100.8 inches = [(6 inches + 6 inches) x 0.40] + 96 inches

$d_{max} > d_{BMP}$

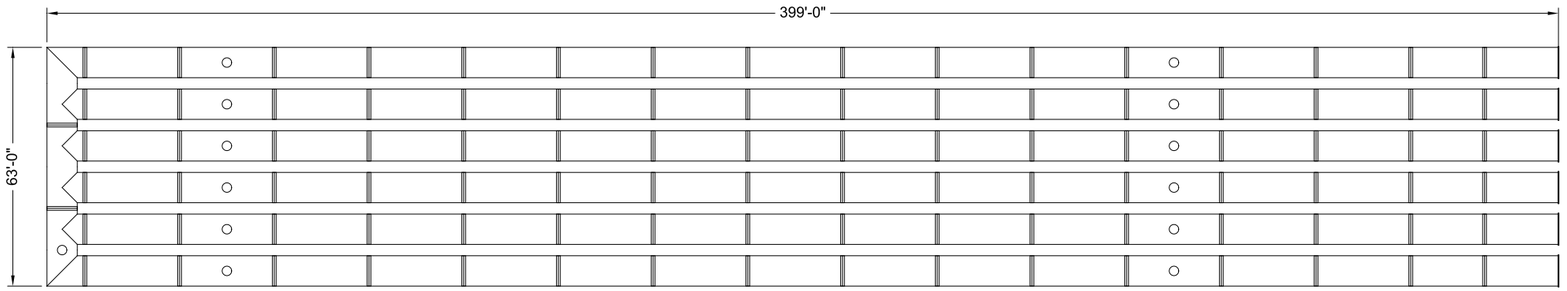
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 2,409 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 166,193 CF
- PIPE STORAGE VOLUME = 121,090 CF
- BACKFILL STORAGE VOLUME = 45,398 CF
- TOTAL STORAGE PROVIDED = 166,488 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

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- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
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ASSEMBLY
SCALE: 1" = 40'

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CONTECH® CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO30736 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 4 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
20705	30736	5/2/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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DA 4 DMA B – CONTECH PERFORATED CMP #4B

Region		Valley	
Drainage Area (acres)		16.96	acres
Drainage Area (sq-ft)		738,778	sq-ft
Impervious Coeff	i =	0.95	< 1.0
Runoff Coeff	**C =**	0.807	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		77,112	cu-ft
DCV		1.770	acre-ft

Design infiltration rate = 0.4 in/hr

d_{max} = 19.2 inches = Design infiltration rate x 48 hours = 0.4 in/hr x 48 hrs

d_{BMP} = 19.2 inches = [(6 inches + 12 inches) x 0.40] + 12 inches

$d_{max} > d_{BMP}$

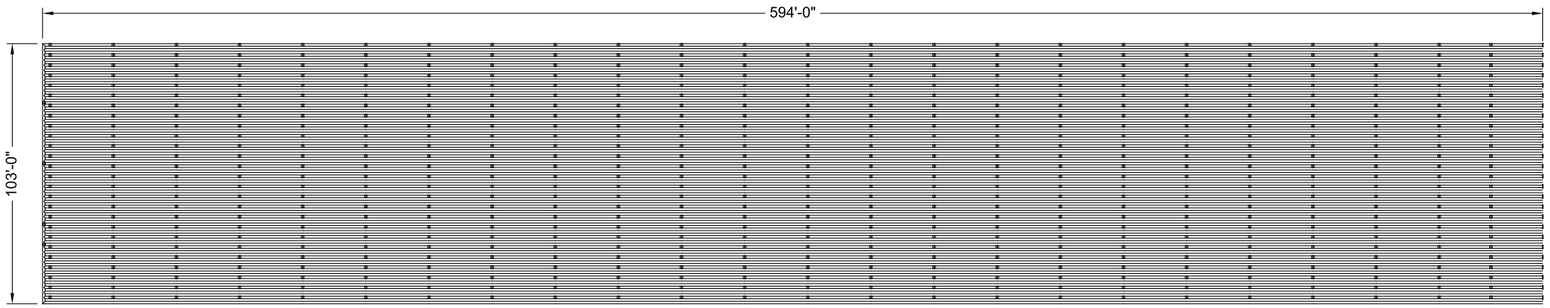
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 30,939 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 77,112 CF
- PIPE STORAGE VOLUME = 24,299 CF
- BACKFILL STORAGE VOLUME = 52,860 CF
- TOTAL STORAGE PROVIDED = 77,160 CF

PIPE DETAILS
- DIAMETER = 12"
- CORRUGATION = 2 2/3x1/2
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 12"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 12"



NOTES

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- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
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ASSEMBLY

SCALE: 1" = 60'

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800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH® CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

PROJECT NO.: 20705 | SEQ. No.: 30854 | DATE: 5/2/2023

DYO30854 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 4 DMA B
Rancho Cucamonga, CA
DETENTION SYSTEM

DESIGNED:	DRAWN:
DYO	DYO
CHECKED:	APPROVED:
DYO	DYO

SHEET NO.: 1

DA 5 DMA A – CONTECH PERFORATED CMP #5A

Region		Valley	
Drainage Area (acres)		10.27	acres
Drainage Area (sq-ft)		447,361	sq-ft
Impervious Coeff	i =	0.95	< 1.0
Runoff Coeff	**C =**	0.807	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		46,695	cu-ft
DCV		1.072	acre-ft

ROW IMPROVEMENTS – CONTECH PERFORATED CMP #5A

Region		Valley	
Drainage Area (acres)		7.42	acres
Drainage Area (sq-ft)		323,215	sq-ft
Impervious Coeff	i =	1	< 1.0
Runoff Coeff	**C =**	0.892	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		37,291	cu-ft
DCV		0.856	acre-ft

Total DCV = 46,695 cu-ft + 37,291 cu-ft = 83,986 cu-ft

Design infiltration rate = 1.0 in/hr

d_{max} = 48 inches = Design infiltration rate x 48 hours = 1.0 in/hr x 48 hrs

d_{BMP} = 46.8 inches = [(6 inches + 6 inches) x 0.40] + 42 inches

$d_{max} > d_{BMP}$

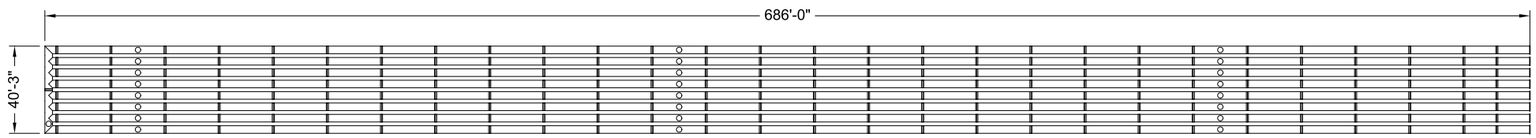
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 5,500 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 83,986 CF
- PIPE STORAGE VOLUME = 52,919 CF
- BACKFILL STORAGE VOLUME = 31,168 CF
- TOTAL STORAGE PROVIDED = 84,086 CF

PIPE DETAILS
- DIAMETER = 42"
- CORRUGATION = 2 2/3x1/2
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 21"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY

SCALE: 1" = 70'

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www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH® CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

YO30856 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 5 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
20705	30856	5/2/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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DA 5 DMA B – CONTECH SOLID CMP #5B AND PROPRIETARY BIOFILTRATION UNIT

Region		Valley	
Drainage Area (acres)		12.96	acres
Drainage Area (sq-ft)		564,538	sq-ft
Impervious Coeff	i =	0.95	< 1.0
Runoff Coeff	**C =**	0.807	
1-hr 2-yr from NOAA		0.534	
P6 Coeff		1.4807	
Mean 6-hr (P6)		0.791	
Drawdown Rate (a)		1.963	
DCV		58,925	cu-ft
DCV		1.353	acre-ft

MWS VOLUME BASED SIZING SHEET

Project Information

Project ID	
Project Name	Arrow Route and Yellowwood Road (DA 5 DMA B)
Project Location	Rancho Cucamonga, CA
Date	4/26/2023



Horizontal Flow Biofiltration System

SIZING CALCULATIONS	Inputs	Units	Notes/References
Impervious Area			
BMP Drainage Area (not required - manual entry - not part of formula)	12.96	Acres	This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, impervious areas, and off-site areas, whether or not they are directly or indirectly connected to the BMP.
Watershed Impervious Ratio (not required - manual entry - not part of formula)			Watershed Imperviousness Ratio", is equal to the percent of total impervious area in the "BMP Drainage Area" divided by 100
Runoff Coefficient "C" (not required - manual entry - not part of formula)			
Water Quality Volume (required)	58925	cubic feet	Use sizing procedures provided by state or local agencies to determine the appropriate Water Quality Volume. Intensities and design storms vary widely by region and method.
Design Storm Duration	0	hours	Varies depending on geographical region. Set at 0 for pump system set up. LA County 3 hours. Call for details.
MWS Sizing			
WetlandMod Model Number (from matrix)	MWS-L-10-20		Please choose size from "Model Size Matrix" Tab
HGL	3.4		Treatment Hydraulic Grade Line
# Of Units	2	quantity	Select the number of systems required to treat the water quality volume. Will very depending on drain down time regulaitons.
Discharge Rate (from matrix)	78.50	gallons/minute	Loading Rate of 0.26 gpm/sq ft or 25 in/hr. Field Verified.
Volume Treated During Event			
Processed through MWS - Linear	0	cubic feet	156.9984 gals/minute
Volume Treated Following Event			
MWS Static Capacity (from matrix)	428.67	cubic feet	
Volume Needed in *Pre-Storage*	58496	cubic feet	Set at zero to start. Size pre-storage system to hold this volume
			Sizing complete when eqaul to value of zero.
TOTAL STORMWATER TREATED	58925	cubic feet	Note: This amount should be equal to the "Water Quality Volume"
Drain Down Time	46.92	hours	Drain down time must be equal to or less than requirement of local juristiction. Default 48 hours.

Feel free to call or email proposed sizing calculations to Modular Wetlands Systems for assistance with sizing, compliance, and design.

Phone: 1-800-338-1122

Email: info@conteches.com

CONTECH ENGINEERED SOLUTIONS
A QUIKRETE COMPANY

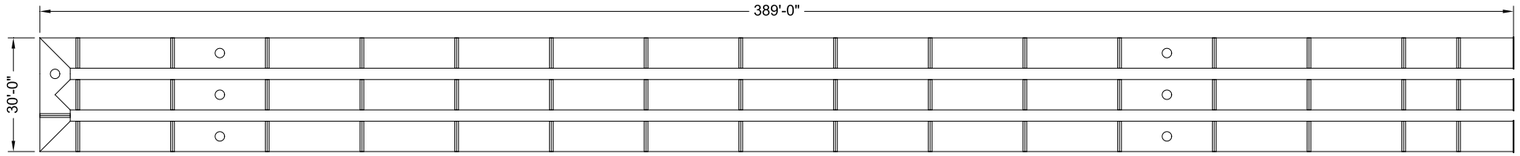
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 1,173 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 58,925 CF
- PIPE STORAGE VOLUME = 58,961 CF
- BACKFILL STORAGE VOLUME = 0 CF
- TOTAL STORAGE PROVIDED = 58,961 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = SOLID
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

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- RISERS TO BE FIELD TRIMMED TO GRADE.
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ASSEMBLY
SCALE: 1" = 40'

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800-338-1122 513-645-7000 513-645-7993 FAX

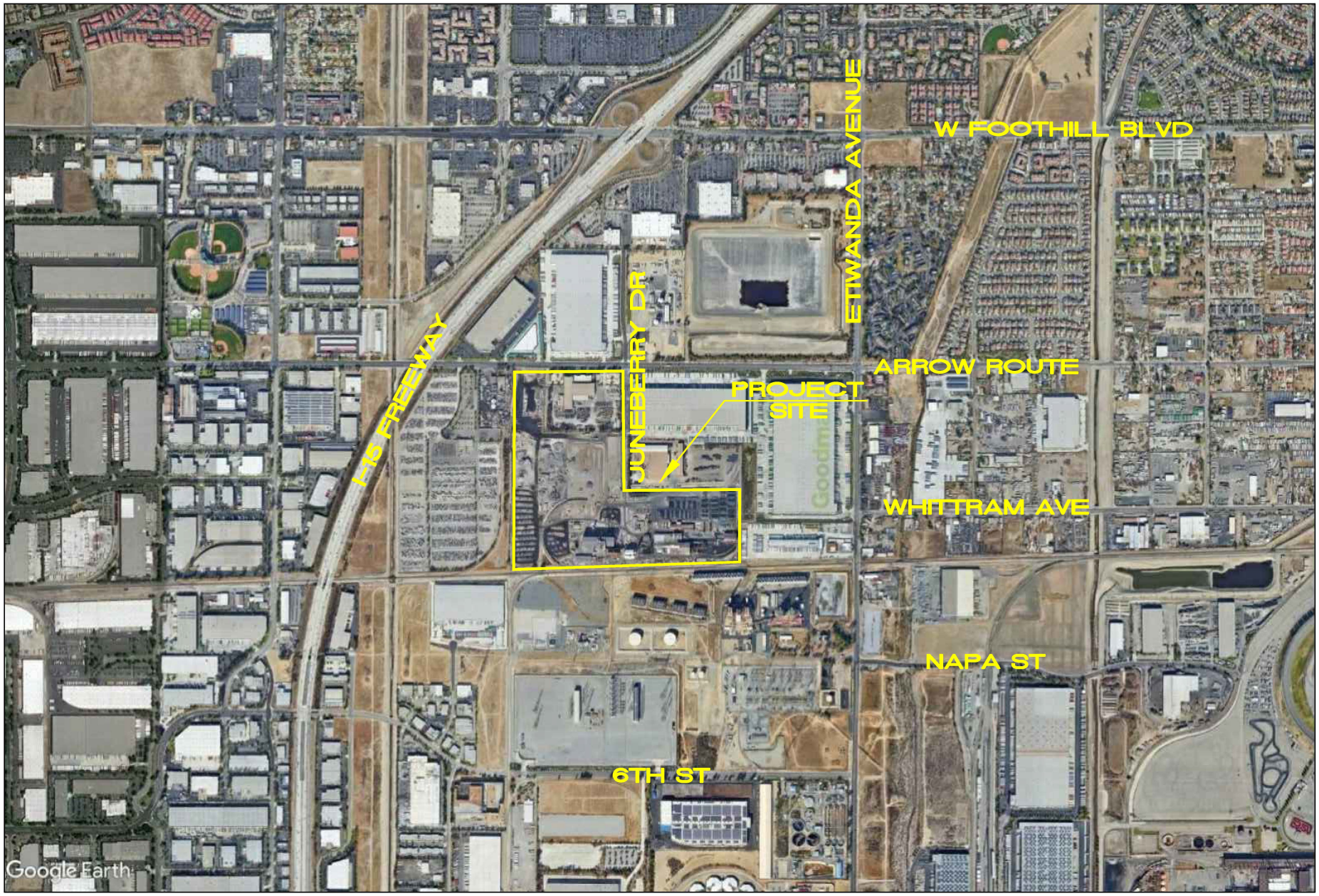
CONTECH® CMP DETENTION SYSTEMS
CONTECH **DYODS** DRAWING

YO30858 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 5 DMA B
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
20705	30858	4/26/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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Attachment C
Site and Drainage Plan



Last Update:11/8/21
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Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

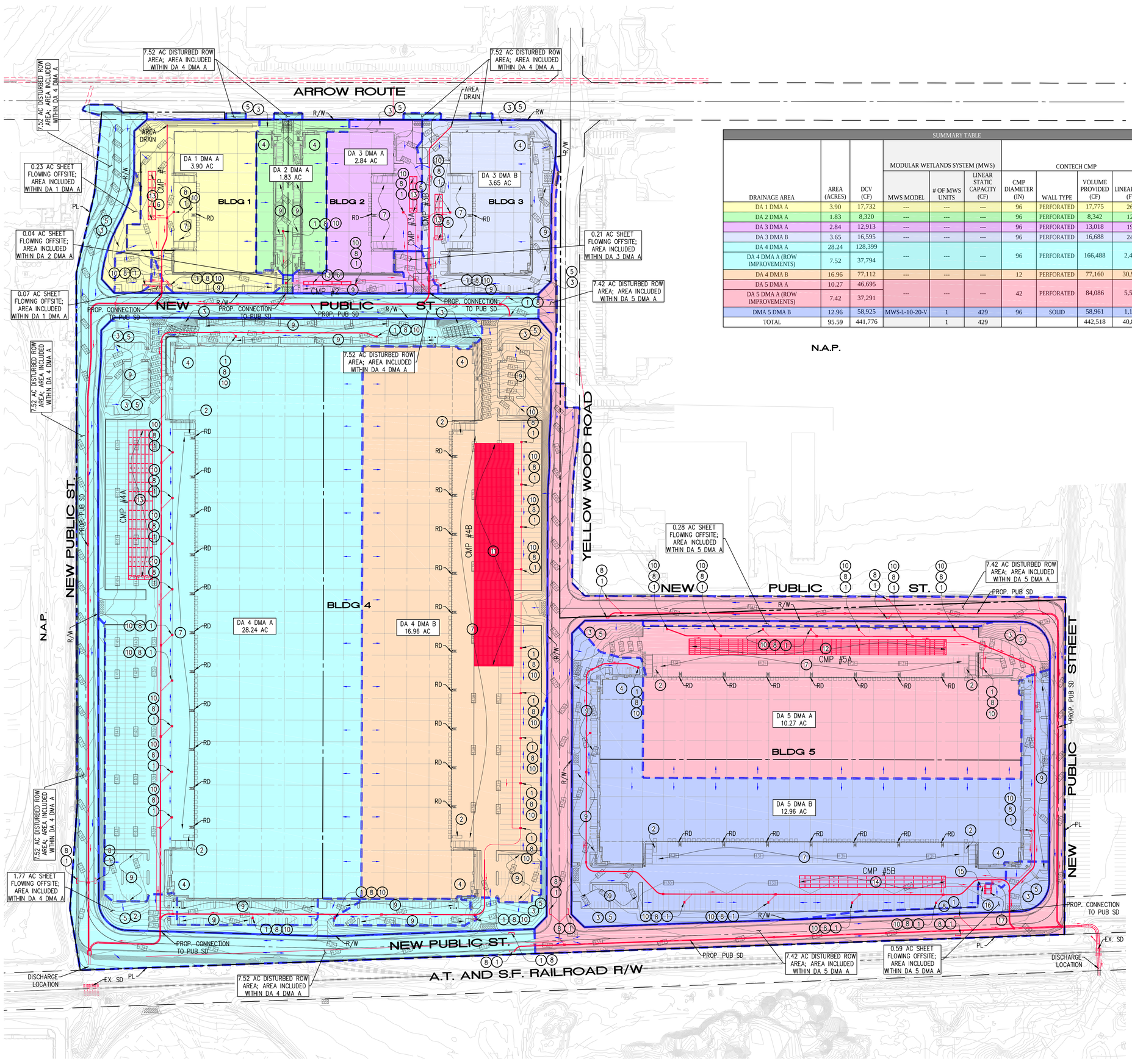
VICINITY MAP

FOR

ARROW ROUTE AND JUNEBERRY DRIVE
RANCHO CUCAMONGA, CA

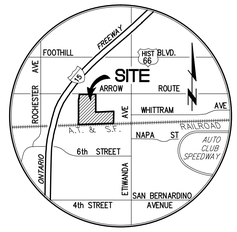
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NTS



SUMMARY TABLE										
			MODULAR WETLANDS SYSTEM (MWS)			CONTECH CMP				
DRAINAGE AREA	AREA (ACRES)	DCV (CF)	MWS MODEL	# OF MWS UNITS	LINEAR STATIC CAPACITY (CF)	CMP DIAMETER (IN)	WALL TYPE	VOLUME PROVIDED (CF)	LINEAR FEET (FT)	TOTAL VOLUME PROVIDED (CF)
DA 1 DMA A	3.90	17,732	---	---	---	96	PERFORATED	17,775	261	17,775
DA 2 DMA A	1.83	8,320	---	---	---	96	PERFORATED	8,342	125	8,342
DA 3 DMA A	2.84	12,913	---	---	---	96	PERFORATED	13,018	191	13,018
DA 3 DMA B	3.65	16,595	---	---	---	96	PERFORATED	16,688	245	16,688
DA 4 DMA A	28.24	128,399	---	---	---	96	PERFORATED	166,488	2,409	166,488
DA 4 DMA A (ROW IMPROVEMENTS)	7.52	37,794								
DA 4 DMA B	16.96	77,112	---	---	---	12	PERFORATED	77,160	30,939	77,160
DA 5 DMA A	10.27	46,695	---	---	---	42	PERFORATED	84,086	5,500	84,086
DA 5 DMA A (ROW IMPROVEMENTS)	7.42	37,291								
DMA 5 DMA B	12.96	58,925	MWS-L-10-20-V	1	429	96	SOLID	58,961	1,173	59,390
TOTAL	95.59	441,776		1	429			442,518	40,843	442,947

N.A.P.



VICINITY MAP
N.T.S.

LEGEND

1. S1–STORM DRAIN SYSTEM SIGNS "NO DUMPING – DRAINS TO WATERWAY"
2. S3–TRASH COMPACTOR
3. S4–EFFICIENT IRRIGATION
4. N1–EDUCATIONAL MATERIALS
5. N3–LANDSCAPE MANAGEMENT BMPS
6. N4–BMP MAINTENANCE
7. N13–HOUSEKEEPING OF LOADING DOCKS
8. N14–CATCH BASIN INSPECTION
9. N15–SWEEPING OF PARKING LOTS
10. DRAIN INSERT(S)
11. CONTECH 12–INCH PERFORATED CMP
12. CONTECH 42–INCH PERFORATED CMP
13. CONTECH 96–INCH PERFORATED CMP
14. CONTECH 96–INCH SOLID CMP
15. SUMP PUMP
16. FORCE MAIN
17. PROPRIETARY BIOFILTRATION UNIT

NOTES:

RD ROOF DRAIN
CMP CORRUGATED METAL PIPE
BOUNDARY
DRAINAGE AREAS
SURFACE – FLOW DIRECTION
SD – FLOW DIRECTION

1. WQMP BMP As-Built Certificate

I hereby certify that the necessary water quality management plan best management practice devices have been constructed under my supervision and are functional to the best of my knowledge as of the date below.

Signature _____ Date _____

Wet Seal

INSTALL ONE 4" ALUMINUM STORM DRAIN PLACARD, PAINTED BLUE WITH A 1/4" SQUARE MOUNTING HOLE (NO DUMPING DRAINS TO WATERWAY) FISH WITH WAVE (PROVIDED BY ENGINEERING SERVICES DEPARTMENT) ON CENTER OF CATCH BASIN BETWEEN SCORING LINE AND CURB LINE. STORM DRAIN PLACARD MUST BE INSTALLED WITH "NO DUMPING DRAINS TO WATERWAY" READING TOWARD THE STREET. MUST INSTALL PLACARD WITH A 1/4"x1" HAMMER SET RIVET (PROVIDED BY ENGINEERING SERVICES DEPARTMENT) AND MASONRY ADHESIVE.

0 50 100 200 300
SCALE: 1"=100'

Last Update: 5/18/23
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CITY OF RANCHO CUCAMONGA
PUBLIC WORKS DEPARTMENT

PREPARED FOR:
BTC III ARROW ROUTE CC LP
4675 MACARTHUR COURT, SUITE 625
NEWPORT BEACH, CA 92660
PHONE: (949) 892–4900
CONTACT: CHRIS SANFORD
chris.sanford@blockcreekgroup.com

PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH:(714)521-4811 FAX(714)521-4173

PRELIMINARY SITE AND DRAINAGE MAP

FOR

ARROW ROUTE AND YELLOWWOOD ROAD
RANCHO CUCAMONGA

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____
Approved by _____ Date _____
Public Works Director _____ R.C.E. XXXXX
Sheet 12 of 29 Sheets

4021/12 OF 29 SHEET

BIO CLEAN FULL CAPTURE FILTER WITH TROUGH SYSTEM

FOR USE IN CURB INLETS

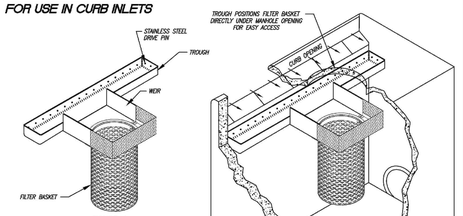


FIGURE 1:
DETAIL OF PARTS

FIGURE 2:
DETAIL OF CONFIGURATION

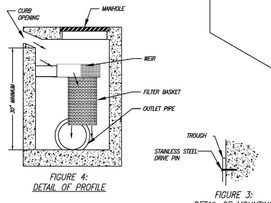


FIGURE 4:
DETAIL OF PROFILE

FIGURE 3:
DETAIL OF MOUNTING

NOTES:

1. TROUGH SYSTEM PROVIDES FOR ENTIRE COVERAGE OF INLET OPENING SO TO DIVERT ALL FLOW TO FILTER.
2. TROUGH SYSTEM MANUFACTURED FROM MARINE GRADE FIBERGLASS, GEL COATED FOR UV PROTECTION.
3. SYSTEM ATTACHED TO THE GRATE/ BRDW WITH NON-CORROSIVE HARDWARE.
4. FILTER MANUFACTURED OF 100S STAINLESS STEEL.
5. FILTER MADE OF NON-CLOGGIN SCREEN WITH 4.7 MM OPENINGS AND MEETS FULL CAPTURE REQUIREMENTS.
6. FILTER CAN BE FITTED WITH HYDROCARBON ABSORBENT BOOM
7. FILTER IS LOCATED DIRECTLY UNDER THE MANHOLE FOR EASY REMOVAL AND MAINTENANCE.
8. LENGTH OF TROUGH CAN VARY FROM 2' TO 30'.
9. OTHER STANDARD AND CUSTOM MODEL SIZES AVAILABLE – CONTACT BIO CLEAN FOR MORE INFORMATION.
10. CONSIDERS A SAFETY FACTOR OF 2.0
11. BYPASS IS FACILITATED VIA OVERFLOW OF THE TROUGH SYSTEM AND IS EQUAL TO THE CAPACITY OF THE CURB OPENING
12. STORAGE CAPACITY BASED ON THE BASKET HALF FULL.
13. ADDITIONAL TREATMENT AND STORAGE CAPACITY CAN BE ACHIEVED BY UTILIZING MULTIPLE FILTER BASKETS.

MODEL NUMBER	TREATMENT FLOW (cfs)*	SOLIDS STORAGE CAPACITY (cu ft)
BIO-CURB-FULL-24	2.85	1.40
BIO-CURB-FULL-12	2.85	0.70

*SEE PAGE 2 FOR EXPLANATION OF FLOW RATES

DRAWING: BIO CLEAN CURB INLET FILTER DETAILS — MEETS FULL CAPTURE REQUIREMENTS

TREATMENT FLOW RATE: 2.85 cfs — MODEL #: BIO-CURB-FULL

WARRANTY: 1 YEAR MANUFACTURER'S

BIO CLEAN ENVIRONMENTAL SERVICES, INC.
398 VIA EL CENTRO, OCEANSIDE, CA 92058
PHONE: 760-433-7640 FAX: 760-433-7176

DATE: 10/12/2017 — SCALE: NTS
DRAFTER: M.C.P. — UNITS: = INCHES

PROJECT:
REVISIONS: DATE:
REVISIONS: DATE:
REVISIONS: DATE:

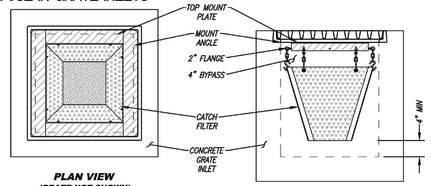
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com

DATE	REVISION DESCRIPTION	BY

800-338-1122 513-645-7000 513-645-7993 FAX

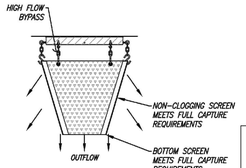
BIO CLEAN FULL CAPTURE FILTER

FOR USE IN GRATE INLETS



PLAN VIEW
(GRATE NOT SHOWN)

ELEVATION VIEW



FLOW DIAGRAM

MODEL #	TREATMENT FLOW RATE (CFS)	BYPASS FLOW (CFS)	SOLIDS STORAGE CAPACITY (CF)
BIO-GRATE-FULL 12-12-12	1.04	1.24	0.15
BIO-GRATE-FULL 18-18-12	1.78	2.79	0.33
BIO-GRATE-FULL 24-24-12	2.70	4.96	0.59
BIO-GRATE-FULL 24-40-12	3.70	6.35	0.88
BIO-GRATE-FULL 24-24-24	7.31	4.96	1.22
BIO-GRATE-FULL 24-40-24	9.53	6.35	1.82
BIO-GRATE-FULL 36-36-24	11.93	7.74	2.73

INSTALLATION NOTES:

1. ALL HARDWARE, FLANGE, FRAME, SCREENS SHALL BE STAINLESS STEEL.
2. OPTIONAL HYDROCARBON BOOM SHALL BE 2" DIAMETER.
3. SEE PERFORMANCE REPORTS IN MANUFACTURES SPECIFICATIONS.
4. OTHER STANDARD AND CUSTOM MODEL SIZES AVAILABLE – CONTACT BIO CLEAN FOR MORE INFORMATION.
5. BASED ON 37% OPEN AREA.
6. CONSIDERS A SAFETY FACTOR OF 2.0.
7. CONSIDERS A LOCAL DEPRESSION PONDING DEPTH OF 6 INCHES.
8. STORAGE CAPACITY BASED ON THE BASKET HALF FULL.
9. CONCRETE STRUCTURES SOLD SEPARATELY.

NOT TO SCALE

PROPRIETARY AND CONFIDENTIAL:
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CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com

GRATE INLET FILTER
FULL CAPTURE
STANDARD DETAIL

DRAIN INSERTS

Form 5-1 BMP Inspection and Maintenance

BMP	Responsible Party(ies)	Inspection/Maintenance Activities Required	Minimum Frequency of Activities
CONTECH CMP Underground System	Owner	Contech recommends ongoing quarterly inspections of the accumulated sediment. All systems shall be designed with an access/inspection manhole situated at or near the inlet and the outlet orifice. Maintaining the system should be scheduled during dry weather.	Inspections shall be done quarterly. Maintenance shall be scheduled when accumulated sediment or trash is clogging the discharge orifice.
Proprietary Biofiltration System	Owner	Remove trash from Screening Device, sediment from Separation Chamber and replace cartridge Filter Media, and Drain Down Filter Media. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.	Average maintenance interval of 6 to 12 months for removing trash from Screening Device. Average interval of 12 to 24 months for removing sediment, replacing Cartridge Filter Media, replacing Drain Down Filter Media and trimming vegetation.
Drain Inserts	Owner	Visually inspect for defects and illegal dumping. Notify proper authorities if illegal dumping has occurred. Using an industrial vacuum, the collected materials shall be removed from the filter basket and disposed of properly. Inspect biosorb hydrocarbon boom and replace as necessary.	Four times per year or following any rain event that would potentially accumulate a large amount of debris in the system. Replace boom twice per year, at a minimum.
Storm Drain Stenciled Message	Owner	Visually inspect for legibility and replace or repaint as necessary.	Annually
N1: Education of Property Owners, Tenants and Occupants on Stormwater BMPs	Owner	Property owner will familiarize him/herself with the educational materials in Attachment "E" and the contents of the WQMP.	Annually (January) for all employees and within 2 months for new hires.
N2: Activity Restrictions	Owner	The owner shall develop ongoing activity restrictions that include those that have the potential to create adverse impacts on water quality. Activities include, but are not limited to: handling and disposal of contaminants, fertilizer and pesticide application restrictions, litter control and pick-up, and vehicle or equipment repair as well as any other activities that may potentially contribute to water pollution.	Ongoing

Form 5-1 BMP Inspection and Maintenance

BMP	Responsible Party(ies)	Inspection/Maintenance Activities Required	Minimum Frequency of Activities
N3: Landscape Management BMPs	Owner	Irrigation must be consistent with City's Water Conservation Ordinance. Fertilizer and pesticide usage will be consistent with County Management Guidelines for Use of Fertilizers and Pesticides.	Ongoing
N4: BMP Maintenance	Owner	BMP maintenance, implementation schedules, and responsible parties are included with each specific BMP narrative.	As described in each BMP listed within this form.
N7: Spill Contingency Plan	Owner	Owner/tenant will have a spill contingency plan, a separate document, based on specific site needs.	Ongoing
N10: Uniform Fire Code Implementation	Owner	If applicable, owner will comply with Article 80 of the Uniform Fire Code enforced by the fire protection agency. The facility operators will be educated annually regarding requirements for handling, storage and proper disposal of hazardous substances.	Ongoing
N11: Litter/Debris Control Program	Owner	Contract with their landscape maintenance firm to provide this service during regularly schedule maintenance. They are required to implement trash management and litter control procedures in the common areas aimed at reducing pollution of drainage water.	Weekly
N12: Employee Training	Owner	The owner will ensure that tenants are also familiar with onsite BMPs and necessary maintenance required of the tenants. Owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. The WQMP requires annual employee training and new hires within 2 months.	Annually (January) for all employees and within 2 months for new hires.
N13: Housekeeping of Loading Docks	Owner	Keep all fluids indoors. Clean up spills immediately and keep spills from entering storm drain system. No direct discharges into the storm drain system. Area shall be inspected weekly for proper containment and practices with spills cleaned up immediately and disposed of properly.	Ongoing

Form 5-1 BMP Inspection and Maintenance

BMP	Responsible Party(ies)	Inspection/Maintenance Activities Required	Minimum Frequency of Activities
N14: Catch Basin Inspection Program	Owner	Monthly inspection by property owner's designee. Inspection consists of immediate repair of any deterioration of the structures and maintenance of drain inserts before and after major rain events. Drain insert maintenance shall be per manufacturer's guidelines.	Monthly inspection and maintain as necessary.
N15: Vacuum Sweeping of Private Streets and Parking Lots	Owner	All landscape maintenance contractors will be required to sweep up all landscape cuttings, mowings and fertilizer materials off paved areas weekly and dispose of properly. Parking areas and drive ways will be swept monthly by sweeping contractor.	Monthly
N17: Comply with all other applicable NPDES permits	Owner	Will comply with Construction General Permit and Industrial General Permit (may apply for No Exposure Certification/NEC).	Ongoing
S1: Provide storm drain system stenciling and signage (CASQA New Development BMP Handbook SD-13)	Owner	"No Dumping – Drains to River" stencils will be applied. Legibility of stencil will be maintained on a yearly basis.	Annually (January)
S3: Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	Owner	Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash. Detail to be provided once available.	Ongoing
S4: Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	Owner	Irrigation systems shall include reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines. Timers will be used to avoid over watering and watering cycles and duration shall be adjusted seasonally by the landscape maintenance contractor. The landscaping areas will be grouped with plants that have similar water requirements. Native or drought tolerant species shall also be used where appropriate to reduce excess irrigation runoff and promote surface filtration.	Adjust watering cycles and duration seasonally / quarterly (Oct, Jan, Apr, and Jul).

PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 261 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 17,732 CF
- PIPE STORAGE VOLUME = 13,119 CF
- BACKFILL STORAGE VOLUME = 4,656 CF
- TOTAL STORAGE PROVIDED = 17,775 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

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- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
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ASSEMBLY
SCALE: 1" = 20'

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CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

CONTECH YO30696 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 1 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
YO705	30696	5/2/2023
DESIGNED:	DRAWN:	
DYO	EYO	
CHECKED:	APPROVED:	
DYO	DYO	
SHEET NO.:		
1		

DA 1 DMA A

PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 125 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 8,320 CF
- PIPE STORAGE VOLUME = 6,283 CF
- BACKFILL STORAGE VOLUME = 2,059 CF
- TOTAL STORAGE PROVIDED = 8,342 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

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- RISERS TO BE FIELD TRIMMED TO GRADE.
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ASSEMBLY
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CONTECH DYODS DRAWING

CONTECH YO30702 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 2 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
YO705	30702	4/25/2023
DESIGNED:	DRAWN:	
DYO	EYO	
CHECKED:	APPROVED:	
DYO	DYO	
SHEET NO.:		
1		

DA 2 DMA A

Last Update:5/18/23
O:\4000-4099\4021\4021CGP13-PRELIMINARY SITE AND DRAINAGE MAP.dwg

CITY OF RANCHO CUCAMONGA
PUBLIC WORKS DEPARTMENT

PREPARED FOR:
BTC III ARROW ROUTE CC LP
4675 MACARTHUR COURT, SUITE 625
NEWPORT BEACH, CA 92660
PHONE: (949) 892-4900
CONTACT: CHRIS SANFORD
chris.sanford@blackcreekgroup.com

PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH:(714)521-4811 FAX(714)521-4173

PRELIMINARY SITE AND DRAINAGE MAP

FOR

ARROW ROUTE AND YELLOWWOOD ROAD
RANCHO CUCAMONGA

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____
Public Works Director R.C.E. XXXXX

Sheet 13 of 29 Sheets

4021/13 OF 29 SHEET

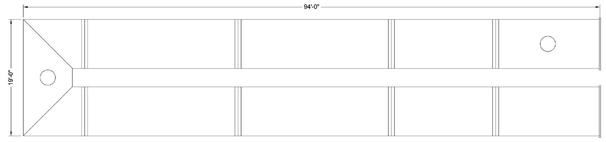
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 191 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 12,913 CF
- PIPE STORAGE VOLUME = 9,601 CF
- BACKFILL STORAGE VOLUME = 3,417 CF
- TOTAL STORAGE PROVIDED = 13,018 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

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ASSEMBLY
SCALE: 1" = 10'

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CONTECH DYODS DRAWING

YO30703 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 3 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
DYOS	30703	9/2/2023
DESIGNED: DYO	DRAWN: EYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.:	1	

DA 3 DMA A

PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 245 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 16,595 CF
- PIPE STORAGE VOLUME = 12,315 CF
- BACKFILL STORAGE VOLUME = 4,373 CF
- TOTAL STORAGE PROVIDED = 16,688 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

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ASSEMBLY
SCALE: 1" = 20'

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YO30706 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 3 DMA B
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
DYOS	30706	9/2/2023
DESIGNED: DYO	DRAWN: EYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.:	1	

DA 3 DMA B

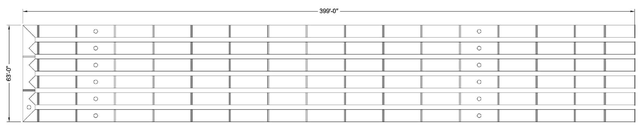
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 2,409 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 166,193 CF
- PIPE STORAGE VOLUME = 121,090 CF
- BACKFILL STORAGE VOLUME = 45,398 CF
- TOTAL STORAGE PROVIDED = 166,488 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

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ASSEMBLY
SCALE: 1" = 40'

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CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

YO30736 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 4 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
DYOS	30736	9/2/2023
DESIGNED: DYO	DRAWN: EYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.:	1	

DA 4 DMA A

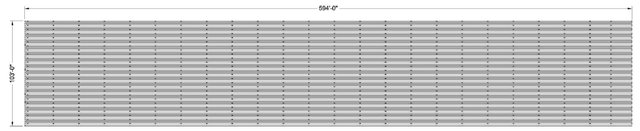
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 30,939 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 77,112 CF
- PIPE STORAGE VOLUME = 24,299 CF
- BACKFILL STORAGE VOLUME = 52,860 CF
- TOTAL STORAGE PROVIDED = 77,160 CF

PIPE DETAILS
- DIAMETER = 12"
- CORRUGATION = 2 2/3x1/2
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 12"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 12"



NOTES

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ASSEMBLY
SCALE: 1" = 60'

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DATE	REVISION DESCRIPTION	BY

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9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

YO30854 TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 4 DMA B
Rancho Cucamonga, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
DYOS	30854	9/2/2023
DESIGNED: DYO	DRAWN: EYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.:	1	

DA 4 DMA B

Last Update:5/18/23
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CITY OF RANCHO CUCAMONGA
PUBLIC WORKS DEPARTMENT

PREPARED FOR:
BTC III ARROW ROUTE CC LP
4675 MACARTHUR COURT, SUITE 625
NEWPORT BEACH, CA 92660
PHONE: (949) 892-4900
CONTACT: CHRIS SANFORD
chris.sanford@blackcreekgroup.com

PRELIMINARY SITE AND DRAINAGE MAP
FOR
ARROW ROUTE AND YELLOWWOOD ROAD
RANCHO CUCAMONGA

PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____
Public Works Director R.C.E. XXXXX

Sheet 14 of 29 Sheets

4021/14 OF 29 SHEET

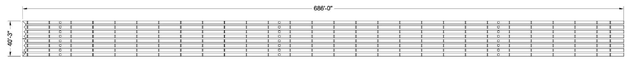
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 5,500 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 83,986 CF
- PIPE STORAGE VOLUME = 52,819 CF
- BACKFILL STORAGE VOLUME = 31,168 CF
- TOTAL STORAGE PROVIDED = 84,086 CF

PIPE DETAILS
- DIAMETER = 42"
- CORRUGATION = 2 2/3x1/2
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 21"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN. QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY
SCALE: 1" = 70'

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DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH: DYODS
DRAWING

PROJECT No.: 30856 | SEQ. No.: 30858 | DATE: 02/20/23
DESIGNED: DYO | DRAWN: EYO
CHECKED: DYO | APPROVED: DYO
SHEET NO.: 1

PROJECT: TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 5 DMA A
Rancho Cucamonga, CA
DETENTION SYSTEM

DA 5 DMA A

PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 1,173 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 58,925 CF
- PIPE STORAGE VOLUME = 58,961 CF
- BACKFILL STORAGE VOLUME = 0 CF
- TOTAL STORAGE PROVIDED = 58,961 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = SOLID
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
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ASSEMBLY
SCALE: 1" = 40'

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DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH: DYODS
DRAWING

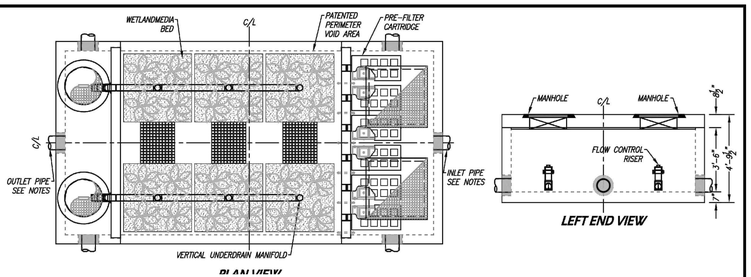
PROJECT No.: 30858 | SEQ. No.: 30858 | DATE: 02/20/23
DESIGNED: DYO | DRAWN: EYO
CHECKED: DYO | APPROVED: DYO
SHEET NO.: 1

PROJECT: TEI 4021 - Arrow Route and Yellowwood Road, Rancho Cucamonga
TEI 4021 - DA 5 DMA B
Rancho Cucamonga, CA
DETENTION SYSTEM

DA 5 DMA B

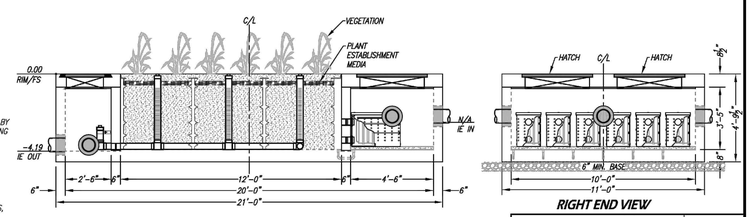
SITE SPECIFIC DATA

PROJECT NUMBER		----	
PROJECT NAME		----	
PROJECT LOCATION		----	
STRUCTURE ID		----	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
15000		---	
TREATMENT HGL AVAILABLE (FT)			---
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			---
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	N/A	PVC	4"
INLET PIPE 2	N/A	PVC	2"
OUTLET PIPE	-4.19	PVC	8"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	0.00	0.00	0.00
SURFACE LOAD	PEDESTRIAN	N/A	PEDESTRIAN
FRAME & COVER	(2) 36"X36"	N/A	(2) #24"
WETLANDMEDIA VOLUME (CY)			12.49
ORIFICE SIZE (DIA. INCHES)			1.89
NOTES: PRELIMINARY, NOT FOR CONSTRUCTION.			



PLAN VIEW

LEFT END VIEW



ELEVATION VIEW

RIGHT END VIEW

REQUIRED TREATMENT VOLUME (CF)	15,000
DRAINDOWN DURATION (HOURS)	24
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	78.50
OPERATING HEAD (FT)	3.4
WETLANDMEDIA INFILTRATION RATE (IN/HR) OR	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

3/16/2023 9:08:09 AM

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MWS-L-10-20-4'-1"-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

DA 5 DMA B

Last Update: 3/16/23
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CITY OF RANCHO CUCAMONGA
PUBLIC WORKS DEPARTMENT

PREPARED FOR:
BTC III ARROW ROUTE CC LP
4675 MACARTHUR COURT, SUITE 625
NEWPORT BEACH, CA 92660
PHONE: (949) 892-4900
CONTACT: CHRIS SANFORD
chris.sanford@blackcreekgroup.com

PREPARED BY:
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14349 FIRESTONE BOULEVARD
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PH.(714)521-4811 FAX(714)521-4173

PRELIMINARY SITE AND DRAINAGE MAP
FOR
ARROW ROUTE AND YELLOWWOOD ROAD
RANCHO CUCAMONGA

Designed by _____ Date _____
Checked by _____ Date _____
Approved by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____
Public Works Director _____ R.C.E. XXXXX

Sheet 15 of 29 Sheets

4021 / 15 OF 29 SHEET

JUNEBERRY DRIVE

ARROW ROUTE

28.00 AC.

APPROXIMATE LOCATION OF EXISTING STORM DRAIN

8.81 AC.

11.77 AC

8.81 AC.

Q_{100} = 29.9 CFS
T_C = 17.2 MIN.
A = 11.8 AC.

APPROXIMATE LOCATION OF EXISTING STORM DRAIN

APPROXIMATE LOCATION OF EXISTING STORM DRAIN

19.18 AC.

8.81 AC.

APPROXIMATE LOCATION OF EXISTING STORM DRAIN

APPROXIMATE LOCATION OF EXISTING STORM DRAIN

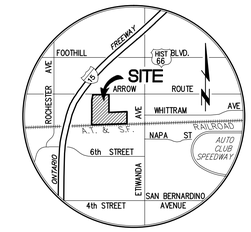
33.10 AC.

9.65 AC.

8.81 AC.

Q_{100} = 98.2 CFS
T_C = 13.8 MIN.
A = 37.6 AC.

Q_{100} = 147.9 CFS
T_C = 17.1 MIN.
A = 61.10 AC.



VICINITY MAP
N.T.S.

0 50 100 200 300
SCALE: 1"=100'

CITY OF RANCHO CUCAMONGA
PUBLIC WORKS DEPARTMENT

HYDROLOGY MAP
EXISTING CONDITION

ARROW ROUTE AND JUNEBERRY DRIVE
RANCHO CUCAMONGA

4021/1 OF 1 SHEET

PREPARED FOR:
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PHONE: (949) 892-4900
CONTACT: CHRIS SANFORD
chris.sanford@blackcreekgroup.com

PREPARED BY:
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PH:(714)521-4811 FAX(714)521-4173
Last Update: 5/18/23
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Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____
Public Works Director _____ R.C.E. XXXXX

Sheet 1 of 1 Sheets

Attachment D
Memorandum of Agreement of Storm Water Quality Management Plan

RECORDING REQUESTED BY
City of Rancho Cucamonga
AND WHEN RECORDED MAIL DOCUMENT TO:

NAME City of Rancho Cucamonga
Engineering Services Dept.
STREET ADDRESS 10500 Civic Center Drive
CITY, STATE & ZIP CODE Rancho Cucamonga, CA 91730

SPACE ABOVE FOR RECORDER'S USE ONLY

MEMORANDUM OF AGREEMENT OF STORM WATER QUALITY MANAGEMENT PLAN

THIS COVER SHEET ADDED TO PROVIDE ADEQUATE SPACE FOR RECORDING INFORMATION

File: TEI 4021

Prepared by: Thienes Engineering, Inc.

Checked by: RS/LP/VL

Assessor's Parcel Number: 0229-121-33, -34, -35 & 0229-131-19

MEMORANDUM OF AGREEMENT OF STORM WATER QUALITY MANAGEMENT PLAN

The undersigned hereby enters into this Memorandum of Storm Water Quality Management Plan (the "Memorandum") on this _____ day of MONTH, 2023 with reference to the following:

A. The undersigned is the owner of certain real property located in the City of Rancho Cucamonga, County of San Bernardino, State of California legally described below and hereto referred to as "Exhibit A" (the "Real Property") and "Exhibit B" (Vicinity Map). Each exhibit is attached hereto and incorporated herein by this reference and also in the Water Quality Management Plan document, on file with the owner or its successors or assigns, and the City and hereinafter is referred to as "WQMP".

B. The undersigned is seeking certain permits and approvals from the City of Rancho Cucamonga ("City") for the development of the Real Property as follows: Precise Grading and Building Permit (the "Approvals").

C. In consideration of the City granting the Approvals, I the undersigned, agree to and accept the terms and conditions of the Storm Water Quality Management Plan (the "Plan") approved by the City's Engineering Services Department on MM/DD/2023, and bind the Real Property with the provisions of the Plan, which is on file with the City of Rancho Cucamonga's Engineering Services Department, File No. DRCXXXX-XXXXX, PGRXXXX-XXXXX, WQMPXXXX-XXXXX.

D. In consideration of the City granting the Approvals, the undersigned has agreed to and accepts the terms and conditions of the Plan as it relates to the Real Property and agrees that the Real Property shall be bound by and subject to the Plan.

E. The owner has chosen to install structures as required by Best Management Practices (BMPs) and to implement non-structural BMPs as described in Exhibit "C" (List of BMP Maintenance Items) and depicted in Exhibit "D" (BMP Site Map). The purpose of the WQMP is to minimize pollutants in urban runoff and to minimize other adverse impacts of urban runoff;

F. Said WQMP has been certified by the Owner and reviewed and approved by the City;

G. Said BMPs, with installation and/or implementation on private property and draining only private property, are part of a private facility with all implementation, maintenance or replacement, therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

NOW, THEREFORE, it is hereby agreed by the undersigned as follows:

1. Owner hereby provides the City of Rancho Cucamonga's designee complete inspection access, of any duration, to the areas in which BMPs are applied and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by the City's Engineer, no advance notice, for the purpose of inspection, sampling, testing of device(s), and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 3 below. City shall make every effort at all times to minimize or avoid interference with Owner's use of the property.

2. The undersigned hereby agrees to the terms and conditions of the Plan, the provisions of which are incorporated by reference as though set out herein in full, and agrees that the Real Property shall be bound by and subject to the terms and conditions of the Plan, subject to minor modifications incorporated during construction, as approved by the City of Rancho Cucamonga Engineering Services Director.

3. The undersigned agrees to conduct the necessary routine maintenance of any structural devices designed into or installed as part of the storm water drainage system on the Real Property to reduce

pollutants in storm water runoff to the maximum extent practicable or to reestablish infiltration through the lifetime of the development which is the subject of Approvals.

4. The undersigned agrees to hold the City, its officials, officers, employees, volunteers, and agents free and harmless from any and all claims, demands, causes of action, costs, expenses, liability, loss, damage, or injury, in law or equity, to property or persons, arising from the imposition of the Plan by the City.

5. The agreements contained herein and the terms and conditions of the Plan are covenants intended to run with the land and shall burden the Real Property and shall be binding upon future owners of all or any portion of the Real Property. Upon a transfer of the Real Property, the transferor (including the undersigned) shall be relieved of any obligations under this Memorandum or the Plan arising from and after the effective date of the transfer.

6. The provisions of this Memorandum are intended to constitute equitable servitudes which shall encumber the Real Property and be binding upon future owners of the Real Property or any portion thereof.

7. The provisions of the Memorandum may be enforced by the City, which, among other remedies, shall have the remedy of injunctive relief and other equitable remedies.

8. This Memorandum shall not be amended, modified or terminated without the prior written consent of the City, which consent to be effective shall be contained in a document executed by the City and recorded against the Real Property.

Owner Name: BTC III Arrow Route CC LP

Authorized Signature _____

Print Name: Chris Sanford

Title: Senior Vice President

Date: _____

Project Description: Construction of an industrial development consisting of five (5) industrial logistics buildings on Arrow Route and Juneberry Drive and construction of new public street on approximately 95.59 acres of land.

ALL CAPACITY ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF _____

COUNTY OF _____

On _____ (Date) before me, _____ (Name and title of the officer) ,

personally appeared _____ (Name of person signing)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____
Signature of officer

(Seal)

EXHIBIT A
(Continued from Item A)
(Legal Description)
(To Be Completed by the Project Engineer)

EXHIBIT B
(Vicinity Map)
(To Be Completed by the Project Engineer)

EXHIBIT C
(LIST OF BMP MAINTENANCE ITEMS)
(To Be Completed by the Project Engineer)

BMP DESCRIPTION	DESCRIPTION OF MAINTENANCE PROCEDURES	MINIMUM INSPECTION / MAINTENANCE FREQUENCY	MAINTENANCE RESPONSIBLE PARTY

EXHIBIT D
(BMP Site Map)
(To Be Completed by the Project Engineer)

Attachment E
Educational Materials

Non-Stormwater Discharges SC-10

Description

Non-stormwater discharges (NSWDs) are flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain if local regulations allow. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include: potable water sources, fire hydrant flushing, air conditioner condensate, landscape irrigation drainage and landscape watering, emergency firefighting, etc. as discussed in Section 2.

However there are certain non-stormwater discharges that pose an environmental concern. These discharges may originate from illegal dumping of industrial material or wastes and illegal connections such as internal floor drains, appliances, industrial processes, sinks, and toilets that are illegally connected to the nearby storm drainage system through on-site drainage and piping. These unauthorized discharges (examples of which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains.

Non-stormwater discharges will need to be addressed through a combination of detection and elimination. The ultimate goal is to effectively eliminate unauthorized non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

pollutants on streets and into the storm drain system and downstream water bodies.

Approach

Initially the Discharger must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is the elimination of unauthorized non-stormwater discharges. See other BMP Fact Sheets for activity-specific pollution prevention procedures.

General Pollution Prevention Protocols

- Implement waste management controls described in SC-34 Waste Handling and Disposal.

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" or similar stenciled or demarcated next to them to warn against ignorant or unintentional dumping of pollutants into the storm drainage system.

- Manage and control sources of water such as hose bibs, faucets, wash racks, irrigation heads, etc. Identify hoses and faucets in the SWPPP, and post signage for appropriate use.

Non-Stormwater Discharge Investigation Protocols

Identifying the sources of non-stormwater discharges requires the Discharger to conduct an investigation of the facility at regular intervals. There are several categories of non-stormwater discharges:

- Visible, easily identifiable discharges, typically generated as surface runoff, such as uncontained surface runoff from vehicle or equipment washing; and

- Non-visible, (e.g., subsurface) discharges into the site drainage system through a variety of pathways that are not obvious.

The approach to detecting and eliminating non-stormwater discharges will vary considerably, as discussed below:

Visible and identifiable discharges

- Conduct routine inspections of the facilities and of each major activity area and identify visible evidence of unauthorized non-stormwater discharges. This may include:

  - ✓ Visual observations of actual discharges occurring;

- ✓ Evidence of surface staining, discoloring etc. that indicates that discharges have occurred;
- ✓ Pools of water in low lying areas when a rain event has not occurred; and
- ✓ Discussions with operations personnel to understand practices that may lead to unauthorized discharges.

- ☐ If evidence of non-stormwater discharges is discovered:
  - ✓ Document the location and circumstances using Worksheets 5 and 6 (Section 2 of the manual), including digital photos;
  - ✓ Identify and implement any quick remedy or corrective action (e.g., moving uncovered containers inside or to a proper location); and
  - ✓ Develop a plan to eliminate the discharge. Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge.
- ☐ Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge. Make sure the facility SWPPP is up-to-date and includes applicable BMPs to address the non-stormwater discharge.

Other Illegal Discharges (Non visible)

Illicit Connections

- ☐ Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- ☐ Isolate problem areas and plug illicit discharge points.
- ☐ Locate and evaluate discharges to the storm drain system.
- ☐ Visual Inspection and Inventory:
  - ✓ Inventory and inspect each discharge point during dry weather.
  - ✓ Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system.
  - ✓ Non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- ☐ A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system.

- Inspect the path of loading/unloading area drain inlets and floor drains in older buildings.

- Never assume storm drains are connected to the sanitary sewer system.

Monitoring for investigation/detection of illegal discharges

- If a suspected illegal or unknown discharge is detected, monitoring of the discharge may help identify the content and/or suggest the source. This may be done with a field screening analysis, flow meter measurements, or by collecting a sample for laboratory analysis. Section 5 and Appendix D describe the necessary field equipment and procedures for field investigations.

- Investigative monitoring may be conducted over time. For example if, a discharge is intermittent, then monitoring might be conducted to determine the timing of the discharge to determine the source.

- Investigative monitoring may be conducted over a spatial area. For example, if a discharge is observed in a pipe, then monitoring might be conducted at accessible upstream locations in order to pinpoint the source of the discharge.

- Generally, investigative monitoring requiring collection of samples and submittal for lab analysis requires proper planning and specially trained staff.

Smoke Testing

Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two piping systems. Smoke testing is generally performed at a downstream location and the smoke is forced upstream using blowers to create positive pressure. The advantage to smoke testing is that it can potentially identify multiple potential discharge sources at once.

- Smoke testing uses a harmless, non-toxic smoke cartridges developed specifically for this purpose.

- Smoke testing requires specialized equipment (e.g., cartridges, blowers) and is generally only appropriate for specially trained staff.

- A Standard Operating Procedure (SOP) for smoke testing is highly desirable. The SOP should address the following elements:

  - ✓ Proper planning and notification of nearby residents and emergency services is necessary since introducing smoke into the system may result in false alarms;

  - ✓ During dry weather, the stormwater collection system is filled with smoke and then traced back to sources;

- ✓ Temporary isolation of segments of pipe using sand bags is often needed to force the smoke into leaking pipes; and
- ✓ The appearance of smoke in a waste vent pipe, at a sewer manhole, or even the base of a toilet indicates that there may be a connection between the sanitary and storm water systems.

- Most municipal wastewater agencies will have necessary staff and equipment to conduct smoke testing and they should be contacted if cross connections with the sanitary sewer are suspected. See SC-44 Drainage System Maintenance for more information.

Dye Testing

- Dye testing is typically performed when there is a suspected specific pollutant source and location (i.e., leaking sanitary sewer) and there is evidence of dry weather flows in the stormwater collection system.
- Dye is released at a probable upstream source location, either the facility's sanitary or process wastewater system. The dye must be released with a sufficient volume of water to flush the system.
- Operators then visually examine the downstream discharge points from the stormwater collection system for the presence of the dye.
- Dye testing can be performed informally using commercially available products in order to conduct an initial investigation for fairly obvious cross-connections.
- More detailed dye testing should be performed by properly trained staff and follow SOPs. Specialized equipment such as fluorometers may be necessary to detect low concentrations of dye.
- Most municipal wastewater agencies will have necessary staff and equipment to conduct dye testing and they should be contacted if cross connections with the sanitary sewer are suspected.

TV Inspection of Drainage System

- Closed Circuit Television (CCTV) can be employed to visually identify illicit connections to the industrial storm drainage system. Two types of CCTV systems are available: (1) a small specially designed camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, or (2) a larger remote operated video camera on treads or wheels that can be guided through storm drains to view the interior of the pipe.
- CCTV systems often include a high-pressure water jet and camera on a flexible cable. The water jet cleans debris and biofilm off the inside of pipes so the camera can take video images of the pipe condition.

- CCTV units can detect large cracks and other defects such as offsets in pipe ends caused by root intrusions or shifting substrate.
- CCTV can also be used to detect dye introduced into the sanitary sewer.
- CCTV inspections require specialized equipment and properly trained staff and are generally best left to specialized contractors or municipal public works staff.

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks may include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. These wastes can cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ An anonymous tip/reporting mechanism; and
  - ✓ Evidence of responsible parties (e.g., tagging, encampments, etc.).
- One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

Once a site has been cleaned:

- Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.
- See fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.



Spill and Leak Prevention and Response

- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- See SC-11 Spill Prevention Control and Cleanup.



Employee Training Program

- Training of technical staff in identifying and documenting illegal dumping incidents is required. The frequency of training must be presented in the SWPPP, and depends on site-specific industrial materials and activities.
- Consider posting a quick reference table near storm drains to reinforce training.
- Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.
- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan. Employees should be able to identify work/jobs with high potential for spills and suggest methods to reduce possibility.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.

- Conduct spill response drills annually (if no events occurred) in order to evaluate the effectiveness of the plan.
- When a responsible party is identified, educate the party on the impacts of his or her actions.



Quality Assurance and Record Keeping

Performance Evaluation

- Annually review internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.
- Develop document and data management procedures.
- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Annually document and report the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.
- Document training activities.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- Many facilities do not have accurate, up-to-date 'as-built' plans or drawings which may be necessary in order to conduct non-stormwater discharge assessments.
  - ✓ Online tools such as Google Earth™ can provide an aerial view of the facility and may be useful in understanding drainage patterns and potential sources of non-stormwater discharges
  - ✓ Local municipal jurisdictions may have useful drainage systems maps.

- Video surveillance cameras are commonly used to secure the perimeter of industrial facilities against break-ins and theft. These surveillance systems may also be useful for capturing illegal dumping activities. Minor, temporary adjustments to the field of view of existing surveillance camera systems to target known or suspected problem areas may be a cost-effective way of capturing illegal dumping activities and identifying the perpetrators.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital facility cost requirements may be minimal unless cross-connections to storm drains are detected.
- Indoor floor drains may require re-plumbing if cross-connections are detected.
- Leaky sanitary sewers will require repair or replacement which can have significant costs depending on the size and industrial activity at the facility.

Maintenance (including administrative and staffing)

- The primary effort is for staff time and depends on how aggressively a program is implemented.
- Costs for containment, and disposal of any leak or discharge is borne by the Discharger.
- Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

Supplemental Information

Permit Requirements

The IGP authorizes certain Non-Storm Water Discharges (NSWDs) provided BMPs are included in the SWPPP and implemented to:

- Reduce or prevent the contact of authorized NSWDs with materials or equipment that are potential sources of pollutants;
- Reduce, to the extent practicable, the flow or volume of authorized NSWDs;
- Ensure that authorized NSWDs do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards (WQS); and,

- Reduce or prevent discharges of pollutants in authorized NSWDs in a manner that reflects best industry practice considering technological availability and economic practicability and achievability."

References and Resources

Center for Watershed Protection, 2004. *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, EPA Cooperative Agreement X-82907801-0.

Dublin San Ramon Sanitation District. http://www.dsrsd.com/wwrw/smoketest.html.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Sacramento Stormwater Management Program, *Best Management Practices for Industrial Storm Water Pollution Control*, Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp.org.

Southern California Coastal Water Research Project, 2013. *The California Microbial Source Identification Manual: A Tiered Approach to Identifying Fecal Pollution Sources to Beaches,* Technical Report 804.

The Storm Water Managers Resource Center, http://www.stormwatercenter.net/.

US EPA. National Pollutant Discharge Elimination System. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=111.

WEF Press Alexandria, Virginia, 2009.Existing Sewer Evaluation and Rehabilitation: *WEF Manual of Practice No. FD-6 ASCE/EWRI Manuals and Reports on Engineering Practice No. 62, Third Edition.*

Spill Prevention, Control & Cleanup SC-11

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental spills. Preparation for accidental spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify hazardous material storage areas, specify material handling procedures, describe spill response procedures, and provide locations of spill clean-up equipment and materials. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills. An adequate supply of spill clean-up materials must be maintained onsite.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	
Nutrients	
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

Approach

General Pollution Prevention Protocols

- ☐ Develop procedures to prevent/mitigate spills to storm drain systems.
- ☐ Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- ☐ Establish procedures and/or controls to minimize spills and leaks. The procedures should address:
  - ✓ Description of the facility, owner and address, activities, chemicals, and quantities present;

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- ✓ Facility map of the locations of industrial materials;
- ✓ Notification and evacuation procedures;
- ✓ Cleanup instructions;
- ✓ Identification of responsible departments; and
- ✓ Identify key spill response personnel.

- ☐ Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.



Spill and Leak Prevention and Response

Spill Prevention

- ☐ Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- ☐ If illegal dumping is observed at the facility:
  - ✓ Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - ✓ Landscaping and beautification efforts may also discourage illegal dumping.
  - ✓ Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

- ☐ Store and contain liquid materials in such a manner that if the container is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

- ☐ If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.



Preventative Maintenance

- ☐ Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.

- ☐ Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

- ☐ Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

- ☐ Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- ☐ Label all containers according to their contents (e.g., solvent, gasoline).

- ☐ Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).

- ☐ Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).

- ☐ Identify key spill response personnel.

Spill Response

- ☐ Clean up leaks and spills immediately.

- ☐ Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).

- ☐ On paved surfaces, clean up spills with as little water as possible.

  - ✓ Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills.

  - ✓ If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

  - ✓ If possible use physical methods for the cleanup of dry chemicals (e.g., brooms, shovels, sweepers, or vacuums).

- ☐ Never hose down or bury dry material spills. Sweep up the material and dispose of properly.

- ☐ Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.

- ☐ For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board or local authority as location regulations dictate.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to 911 for dispatch and clean-up assistance when needed. Do not contact fire agencies directly.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ Clean-up procedures; and
  - ✓ Responsible parties.



Employee Training Program

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - ✓ The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur; and
  - ✓ Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.
- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- State regulations exist for facilities with a storage capacity of 10,000 gallons or more of petroleum to prepare a Spill Prevention Control and Countermeasure (SPCC) Plan (Health & Safety Code Chapter 6.67).
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- Develop spill prevention and control plan, provide and document training, conduct inspections of material storage areas, and supply spill kits.
- Extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident;
- Weather conditions;
- Duration of the spill/leak/discharge;

- Cause of the spill/leak/discharge;
- Response procedures implemented;
- Persons notified; and
- Environmental problems associated with the spill/leak/discharge.

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- Date and time the inspection was performed;
- Name of the inspector;
- Items inspected;
- Problems noted;
- Corrective action required; and
- Date corrective action was taken.

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems;
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves);
- External corrosion and structural failure;
- Spills and overfills due to operator error; and
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa.

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanges, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.

- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use absorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:

  Cover fueling area if possible.

  Use a perimeter drain or slope pavement inward with drainage to a sump.

  Pave fueling area with concrete rather than asphalt.

- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off' of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use absorbent materials on small spills and general cleaning rather than hosing down the area. Remove the absorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities.

The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department).
- Develop procedures to prevent/mitigate spills to storm drain systems.
- Identify responsible departments.

- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- Address spills at municipal facilities, as well as public areas.
- Provide training concerning spill prevention, response and cleanup to all appropriate personnel.

References and Resources

California's Nonpoint Source Program Plan. http://www.swrcb.ca.gov/nps/index.html.

Clark County Storm Water Pollution Control Manual. Available online at: http://www.co.clark.wa.us/pubworks/bmpman.pdf.

King County Storm Water Pollution Control Manual. Available online at: http://dnr.metrokc.gov/wlr/dss/spcm.htm.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp.org.

The Stormwater Managers Resource Center. http://www.stormwatercenter.net/.

Outdoor Loading/Unloading SC-30

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by wind, stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of material to rainfall whenever possible.
- Prevent stormwater run-on.
- Check equipment regularly for leaks.



Good Housekeeping

- Develop an operations plan that describes procedures for loading and/or unloading.
- Conduct loading and unloading in dry weather if possible.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- Consider placing a seal or door skirt between delivery vehicles and building to prevent exposure to rain.
- Design loading/unloading area to prevent stormwater run-on, which would include grading or berming the area, and position roof downspouts so they direct stormwater away from the loading/unloading areas.
- Have employees load and unload all materials and equipment in covered areas such as building overhangs at loading docks if feasible.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains inlets in the area.
- Grade and/or berm the loading/unloading area with drainage to sump; regularly remove materials accumulated in sump.



Spill Response and Prevention Procedures

- Keep your spill prevention and control plan up-to-date or have an emergency spill cleanup plan readily available, as applicable.
- Contain leaks during transfer.
- Store and maintain appropriate spill cleanup materials in a location that is readily accessible and known to all employees.
- Ensure that employees are familiar with the site's spill control plan and proper spill cleanup procedures.
- Use drip pans or comparable devices when transferring oils, solvents, and paints.



Material Handling and Waste Management

- Spot clean leaks and drips routinely to prevent runoff of spillage.
- Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.

- Do not put used or leftover cleaning solutions, solvents, and automotive fluids in the storm drain or sanitary sewer.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.
  - ✓ Install a low containment berm around the waste receptacle area.
  - ✓ Use and maintain drip pans under waste receptacles.
- Post "no littering" signs.
- Perform work area clean-up and dry sweep after daily operations.



Employee Training Program

- Train employees (e.g., fork lift operators) and contractors on proper spill containment and cleanup.
- Have employees trained in spill containment and cleanup present during loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.
- Make sure forklift operators are properly trained on loading and unloading procedures.



Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document activities performed, quantities of materials removed, and improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.
- Keep accurate logs of daily clean-up operations.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- Space and time limitations may preclude all transfers from being performed indoors or under cover.
  - ✓ Designate specific areas for outdoor loading and unloading.
  - ✓ Require employees to understand and follow spill and leak prevention BMPs.
- It may not be possible to conduct transfers only during dry weather.
  - ✓ Limit materials and equipment rainfall exposure to all extents practicable.
  - ✓ Require employees to understand and follow spill and leak prevention BMPs.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

Many facilities will already have indoor or covered areas where loading/unloading takes place and will require no additional capital expenditures.

If outdoor activities are required, construction of berms or other means to retain spills and leaks may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.

Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

Maintenance

Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.

- Conduct regular inspections and make repairs and improvements as necessary.
- Check loading and unloading equipment regularly for leaks.
- Conduct regular broom dry-sweeping of area. Do not wash with water.

Supplemental Information

Loading and Unloading of Liquids

- Loading or unloading of liquids should occur in the manufacturing building so that any spills that are not completely retained can be discharged to the sanitary sewer,

treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - ✓ The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - ✓ The transfer area should be designed to prevent run-on of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.
  - ✓ The transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer. A positive control valve should be installed on the drain.
- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:
  - ✓ Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles. Use drip pans when making and breaking connections.
  - ✓ Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook BMP 26 Fueling and Liquid Loading/Unloading Operations.* Available online at: http://www.pca.state.mn.us/index.php/view-document.html?gid=10557.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315.* Available online at: http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations.* Available online at: http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf.

Sacramento Stormwater Management Program, *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

Sacramento County Environmental Management Stormwater Program: *Best Management Practices*. Available online at: http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html.

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp-w2k.com/.

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA's Multi Sector General Permit. Available online at: http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm.

Outdoor Equipment Operations SC-32

Description

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, and solid waste treatment and disposal are examples of process operations that can lead to contamination of stormwater runoff. The targeted constituents will vary for each site depending on the operation being performed.

Approach

Implement source control BMPs to limit exposure of outdoor equipment to direct precipitation and stormwater run-on. Refer to SC-22 Vehicle and Equipment Repair for additional information.

General Pollution Prevention Protocols

- ☐ Perform the activity during dry periods whenever possible.
- ☐ Install secondary containment measures where leaks and spills may occur.
- ☐ Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.
- ☐ Connect process equipment area to public sanitary sewer or facility wastewater treatment system when possible. Some jurisdictions require that secondary containment areas be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.



Good Housekeeping

- ☐ Manage materials and waste properly (see Material Handling and Waste Management) to reduce adverse impacts on stormwater quality.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*

Targeted Constituents	
Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Cover the work area with a permanent roof if possible.
- Use drop cloths for sanding and painting operations.
- Use a vacuum for fine particle clean-up in pavement cracks and crevices.
- Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (run-on prevention).
- "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Use roll down or permanent walls when windy/breezy to prevent wind transport of particulates/pollutants.



Preventative Maintenance

- Design outdoor equipment areas to prevent stormwater runoff and spills. Use a perimeter drain or slope pavement inward with drainage to sump.
- Dry clean the work area regularly. Do not wash outdoor equipment with water if there is a direct connection to the storm drain.
- Pave area with concrete rather than asphalt.
- Inspect outdoor equipment regularly for leaks or spills. Also check for structural failure, spills and overfills due to operator error, and/or failure of piping system.
- Inspect and clean, if necessary, storm drain inlets and catch basins within the outdoor equipment area before October 1 each year.



Spill Response and Prevention Procedures

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Prevent operator errors by using engineering safe guards and thus reducing accidental releases of pollutant.



Material Handling and Waste Management

- Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drain or sewer connections.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.



Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees on proper equipment operation and maintenance procedures.
- Train all employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Ensure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.



Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for outdoor equipment, types and quantities of materials removed and disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- Providing cover over outdoor equipment may be impractical or cost-prohibitive.
  - ✓ Operate outdoor equipment only during periods of dry weather.
- Regular operations and time limitations may require outdoor activities during wet weather.
  - ✓ Designate specific areas for outdoor activities.
  - ✓ Allow time for work area clean-up after each shift.
  - ✓ Require employees to understand and follow preventive maintenance and spill and leak prevention BMPs.
  - ✓ Design and install secondary containment and good housekeeping BMPs for outdoor equipment area.
- Storage sheds often must meet building and fire code requirements.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Many facilities will already have indoor covered areas where vehicle and equipment repairs take place and will require no additional capital expenditures.
- If outdoor activities are required, construction of berms or other means to retain spills and leaks may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.
- Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

Maintenance

- Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.
- For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration.
- Routine cleanout of oil and grease is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.

References and Resources

Minnesota Pollution Control Agency. *Industrial Stormwater Best Management Practices Guidebook BMP 26 Fueling and Liquid Loading/Unloading Operations.* Available online at: http://www.pca.state.mn.us/index.php/view-document.html?gid=10557.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315.* Available online at: http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Oregon Department of Environmental Quality, *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations,* February 2013. Available online at: http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control.* Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at: http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html.

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp-w2k.com/

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA's Multi Sector General Permit. Available online at: http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm.

Waste Handling & Disposal SC-34

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on and runoff.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Accomplish reduction in the amount of waste generated using the following source controls:
  - ✓ Production planning and sequencing;
  - ✓ Process or equipment modification;
  - ✓ Raw material substitution or elimination;
  - ✓ Loss prevention and housekeeping;
  - ✓ Waste segregation and separation; and
  - ✓ Close loop recycling.
- ☐ Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- ☐ Recycle materials whenever possible.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	
Nutrients	
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Use the entire product before disposing of the container.
- To the extent possible, store wastes under cover or indoors after ensuring all safety concerns such as fire hazard and ventilation are addressed.
- Provide containers for each waste stream at each work station. Allow time after shift to clean area.



Good Housekeeping

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain. Clean in a designated wash area that drains to a clarifier.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Stencil or demarcate storm drains on the facility's property with prohibitive message regarding waste disposal.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- If possible, move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.



Preventative Maintenance

- Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent waste materials from directly contacting rain.

- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, vacuuming, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.



Spill Response and Prevention Procedures

- Keep your spill prevention and plan up-to-date.
- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills.
- Collect all spilled liquids and properly dispose of them.
- Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.
- Ensure that vehicles transporting waste have spill prevention equipment that can prevent spills during transport. Spill prevention equipment includes:
  - ✓ Vehicles equipped with baffles for liquid waste; and
  - ✓ Trucks with sealed gates and spill guards for solid waste.



Material Handling and Waste Management

Litter Control

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.

- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers and protect them from vandalism.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Hazardous waste cannot be reused or recycled; it must be disposed of by a licensed hazardous waste hauler.



Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- Train employees and subcontractors in proper hazardous waste management.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.



Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for waste handling and disposal, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.

- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital costs will vary substantially depending on the size of the facility and the types of waste handled. Significant capital costs may be associated with reducing wastes by modifying processes or implementing closed-loop recycling.
- Many facilities will already have indoor covered areas where waste materials will be stored and will require no additional capital expenditures for providing cover.
- If outdoor storage of wastes is required, construction of berms or other means to prevent stormwater run-on and runoff may require appropriate constructed systems for containment.
- Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

Maintenance

- Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

References and Resources

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook*. Available online at: http://www.pca.state.mn.us/index.php/view-document.html?gid=10557.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315,* Revised. Available online at: http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at: http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html.

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp-w2k.com/

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA's Multi Sector General Permit. Available online at: http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm.

Safer Alternative Products SC-35

Description

Promote the use of less harmful products and products that contain little or no TMDL and 303(d) list pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests

Objectives
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	
Preventative Maintenance	
Spill and Leak Prevention and Response	
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	

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by methods that pose a lower risk to employees, the public, and the environment.

- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies
- Procedures
  - ✓ Standard operating procedures (SOPs);
  - ✓ Purchasing guidelines and procedures; and
  - ✓ Bid packages (services and supplies).
- Materials
  - ✓ Preferred or approved product and supplier lists;
  - ✓ Product and supplier evaluation criteria;
  - ✓ Training sessions and manuals; and
  - ✓ Fact sheets for employees.

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC-20 – SC-22) and SC-41 Building and Grounds Maintenance.



Employee Training Program

- Employees who handle potentially harmful materials should be trained in the use of safer alternatives.
- Purchasing departments should be trained on safer alternative products and encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.
- Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources provided in this fact sheet.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds"

- Alternative products may not be available, suitable, or effective in every case.

- ✓ Minimize use of hazardous/harmful products if no alternative product is available.

Regulatory Considerations

This BMP has no regulatory requirements unless local/municipal ordinance applies. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements;
- Storm water runoff sampling requirements;
- Training and licensing requirements; and
- Record keeping and reporting requirements.

Cost Considerations

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.
- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Refined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes with low VOC content are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps.

All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.

- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting. Use paper products with post-consumer recycled content and implement electric had dryers.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control, http://www.dtsc.ca.gov/PollutionPrevention/GreenTechnology/Index.cfm.

CalRecycle, http://www.calrecycle.ca.gov/Business/Regulated.htm.

City of Santa Monica Office of Sustainability and Environment, http://www.smgov.net/departments/ose/.

City of Palo Alto, http:// www.city.palo-alto.ca.us/cleanbay.

City and County of San Francisco, Department of the Environment, http://www.sfenvironment.org/toxics-health/greener-business-practices.

Green Business Program, http://www.greenbiz.ca.gov/GRlocal.html .

Product Stewardship Institute, http://www.productstewardship.us/index.cfm.

Sacramento Clean Water Business Partners. http://www.sacstormwater.org/CleanWaterBusinessPartners/CleanWaterBusinessPartners.html.

USEPA. National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges From Industrial Facilities, http://cfpub.epa.gov/npdes/stormwater/indust.cfm.

USEPA Region IX Pollution Prevention Program, http://www.epa.gov/region9/waste/p2/business.html.

Western Sustainability and Pollution Prevention Network, http://wsppn.org/.

Metals (mercury, copper)

National Electrical Manufacturers Association – Environmental Stewardship, http://www.nema.org/Policy/Environmental-Stewardship/pages/default.aspx.

Sustainable Conservation, http://www.suscon.org.

Auto Recycling Project

Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center, http://www.birc.org.

California Department of Pesticide Regulation, http://www.cdpr.ca.gov/dprprograms.htm.

University of California Statewide IPM Program, http://www.ipm.ucdavis.edu/default.html.

Dioxins

Bay Area Dioxins Project, http://www.abag.ca.gov/bayarea/dioxin/project_materials.htm.

Building & Grounds Maintenance SC-41

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Switch to non-toxic chemicals for maintenance to the maximum extent possible.
- ☐ Choose cleaning agents that can be recycled.
- ☐ Encourage proper lawn management and landscaping, including use of native vegetation.
- ☐ Encourage use of Integrated Pest Management techniques for pest control.
- ☐ Encourage proper onsite recycling of yard trimmings.
- ☐ Recycle residual paints, solvents, lumber, and other material as much as possible.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Clean work areas at the end of each work shift using dry cleaning methods such as sweeping and vacuuming.



Good Housekeeping

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.

- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.

- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.

- Use mulch or other erosion control measures on exposed soils. See also SC-40, Contaminated and Erodible Areas, for more information.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.

- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.

- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.

- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.

- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and

solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Building & Grounds Maintenance SC-41



Spill Response and Prevention Procedures

- ☐ Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- ☐ Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- ☐ Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- ☐ Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- ☐ Clean up spills immediately.



Material Handling and Waste Management

- ☐ Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- ☐ Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- ☐ Dispose of empty pesticide containers according to the instructions on the container label.
- ☐ Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- ☐ Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.



Employee Training Program

- ☐ Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- ☐ Train employees and contractors in proper techniques for spill containment and cleanup.
- ☐ Be sure the frequency of training takes into account the complexity of the operations and the needs of individual staff.



Quality Assurance and Record Keeping

- ☐ Keep accurate logs that document maintenance activities performed and minimum BMP measures implemented.
- ☐ Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- ☐ Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Additional capital costs are not anticipated for building and grounds maintenance. Implementation of the minimum BMPs described above should be conducted as part of regular site operations.

Maintenance

- Maintenance activities for the BMPs described above will be minimal, and no additional cost is anticipated.

Supplemental Information

Fire Sprinkler Line Flushing

Site fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual.*

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook.* Available online at: http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control.* Available online at:

http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

US EPA, 1997. *Best Management Practices Handbook for Hazardous Waste Containers*. Available online at: http://www.epa.gov/region6/6en/h/handbk4.pdf.

Ventura Countywide Stormwater Management Program Clean Business Fact Sheets. Available online at: http://www.vcstormwater.org/documents/programs_business/building.pdf.

Building Repair and Construction SC-42

Description

Site modifications are common, particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and minor construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

This fact sheet is intended to be used for minor repairs and construction. If major construction is required, the guidelines in the Construction BMP Handbook should be followed.

Approach

The BMP approach is to reduce potential for pollutant discharges through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Recycle residual paints, solvents, lumber, and other materials to the maximum extent practicable.
- ☐ Avoid outdoor repairs and construction during periods of wet weather.
- ☐ Use safer alternative products to the maximum extent practicable. See also SC-35 Safer Alternative Products for more information.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	✓
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Buy recycled products to the maximum extent practicable.
- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.
- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.



Good Housekeeping

Repair & Remodeling

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep and vacuum the area regularly to remove sediments and small debris.
- Cover raw materials of particular concern that must be left outside, particularly during the rainy season. See also SC-33 Outdoor Storage of Raw Materials for more information.
- Use equipment and tools such as bag sanders to reduce accumulation of debris.
- Limit/prohibit work on windy days; implement roll-down walls or other measures to reduce wind transport of pollutants.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store liquid materials properly that are normally used in repair and remodeling such as paints and solvents. See also SC-31 Outdoor Liquid Container Storage for more information.
- Sweep out rain gutters or wash the gutter and trap the particles at the outlet of the downspout. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed. See also SC-44 Drainage System Maintenance for more information.

Painting

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.

- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100 percent effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose of the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.



Spill Response and Prevention Procedures

- Keep your spill prevention and control plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.



Material Handling and Waste Management

- Post “No Littering” signs and enforce anti-litter laws.

- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.
- Make sure that hazardous waste is collected, removed, and disposed of properly. See also SC-34, Waste Handling and Disposal for more information.



Sediment and Erosion Controls

- Limit disturbance to bare soils and preserve natural vegetation whenever possible. See also EC-2, Preservation of Existing Vegetation, in the Construction BMP Handbook.
- Stabilize loose soils by re-vegetating whenever possible. See also EC-4 Hydroseeding, in the Construction BMP Handbook.
- Utilize non-vegetative stabilization methods for areas prone to erosion where vegetative options are not feasible. Examples include:
  - ✓ Areas of vehicular or pedestrian traffic such as roads or paths;
  - ✓ Arid environments where vegetation would not provide timely ground coverage, or would require excessive irrigation;
  - ✓ Rocky substrate, infertile or droughty soils where vegetation would be difficult to establish; and
  - ✓ Areas where vegetation will not grow adequately within the construction time frame.

  There are several non-vegetative stabilization methods and selection should be based on site-specific conditions. See also EC-16 Non-Vegetative Stabilization, in the Construction BMP Handbook.

- Utilize chemical stabilization when needed. See also EC-5 Soil Binders, in the Construction BMP Handbook.
- Use geosynthetic membranes to control erosion if feasible. See also EC-7 Geotextiles and Mats, in the Construction BMP Handbook.
- Stabilize all roadways, entrances, and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site. See also TC 1-3 Tracking Control, in the Construction BMP Handbook.
- Refer to the supplemental information provided below for projects that involve more extensive soil disturbance activities.



Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly implement the source control BMPs described above. Detailed information for Sediment and Erosion Control BMPs is provided in the Construction BMP Handbook.
- Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about pollutant source control responsibilities.
- Use a training log or similar method to document training.



Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for building repair and construction, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- This BMP is for minor construction only. The State's General Construction Activity Stormwater Permit has more extensive requirements for larger projects that would disturb one or more acres of surface.
  - ✓ Refer to the companion "Construction Best Management Practice Handbook" which contains specific guidance and best management practices for larger-scale projects.

- Time constraints may require some outdoor repairs and construction during wet weather.
  - ✓ Require employees to understand and follow good housekeeping and spill and leak prevention BMPs.
  - ✓ Inspect sediment and erosion control BMPs daily during periods of wet weather and repair or improve BMP implementation as necessary.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
  - ✓ Minimize use of hazardous materials to the maximum extent practicable.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.
- Prices for recycled/safer alternative materials and fluids may be higher than those of conventional materials.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Limited capital investments may be required at some sites if adequate cover and containment facilities do not exist for construction materials and wastes.
- Purchase and installation of erosion and sediment controls, if needed will require additional capital investments, and this amount will vary depending on site characteristics and the types of BMPs being implemented.
- Minimize costs by maintaining existing vegetation and limiting construction operations on bare soils.

Maintenance

- The erosion and sediment control BMPs described above require periodic inspection and maintenance to remain effective. The cost of these actions will vary depending on site characteristics and the types of BMPs being implemented.
- Irrigation costs may be required to establish and maintain vegetation.

Supplemental Information

Soil/Erosion Control

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective "in-line" treatment devices. Include in the catch basin a "turn-down" elbow or similar device to trap floatables.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

California Stormwater Quality Association, 2012. *Construction Stormwater Best Management Practice Handbook*. Available at http://www.casqa.org.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

US EPA. *Construction Site Stormwater Runoff Control*. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4.

Parking Area Maintenance SC-43

Description

Parking lots can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

BMPs for other outdoor areas on site (loading/unloading, material storage, and equipment operations) are described in SC-30 through SC-33.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- Encourage advanced designs and maintenance strategies for impervious parking lots. Refer to the treatment control BMP fact sheets in this manual for additional information.
- Keep accurate maintenance logs to evaluate BMP implementation.



Good Housekeeping

- Keep all parking areas clean and orderly. Remove debris, litter, and sediments in a timely fashion.
- Post "No Littering" signs and enforce anti-litter laws.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- ☐ Provide an adequate number of litter receptacles.
- ☐ Clean out and cover litter receptacles frequently to prevent spillage.

Preventative Maintenance

Inspection

Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.

- ☐ Inspect cleaning equipment/sweepers for leaks on a regular basis.

Surface Cleaning

- ☐ Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- ☐ Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- ☐ Sweep all parking lots at least once before the onset of the wet season.
- ☐ Dispose of parking lot sweeping debris and dirt at a landfill.
- ☐ Follow the procedures below if water is used to clean surfaces:
  - ✓ Block the storm drain or contain runoff.
  - ✓ Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
- ☐ Follow the procedures below when cleaning heavy oily deposits:
  - ✓ Clean oily spots with absorbent materials.
  - ✓ Use a screen or filter fabric over inlet, then wash surfaces.
  - ✓ Do not allow discharges to the storm drain.
  - ✓ Vacuum/pump discharges to a tank or discharge to sanitary sewer.
  - ✓ Dispose of spilled materials and absorbents appropriately.

Surface Repair

- ☐ Check local ordinance for SUSMP/LID ordinance.
- ☐ Preheat, transfer or load hot bituminous material away from storm drain inlets.
- ☐ Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- ☐ Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in

place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- Use only as much water as necessary for dust control during sweeping to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.



Spill Response and Prevention Procedures

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.



Employee Training Program

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.



Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for parking area maintenance, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital investments may be required at some sites to purchase sweeping equipment, train sweeper operators, install oil/water/sand separators, or implement advanced BMPs. These costs can vary significantly depending upon site conditions and the amount of BMPs required.

Maintenance

- Sweep and clean parking lots regularly to minimize pollutant transport into storm drains from stormwater runoff.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Maintain advanced BMPs such as vegetated swales, infiltration trenches, or detention basins as appropriate. Refer to the treatment control fact sheets for more information.

Supplemental Information

Advanced BMPs

Some parking areas may require advanced BMPs to further reduce pollutants in stormwater runoff, and a few examples are listed below. Refer to the Treatment Control Fact Sheets and the New Development and Redevelopment Manual for more information.

- When possible, direct sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

California Stormwater Quality Association, 2003. *New Development and Redevelopment Stormwater Best Management Practice Handbook*. Available online at: https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Pollution from Surface Cleaning Folder, 1996, 2003. Bay Area Stormwater Management Agencies Association. Available online at: http://basmaa.org/Portals/0/documents/pdf/Pollution%20from%20Surface%20Cleaning.pdf.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

The Storm Water Managers Resource Center, http://www.stormwatercenter.net.

US EPA. *Post-Construction Stormwater Management in New Development and Redevelopment*. BMP Fact Sheets. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5.

Drainage System Maintenance SC-44

Description

As a consequence of its function, the stormwater drainage facilities on site convey stormwater that may contain certain pollutants either to the offsite conveyance system that collects and transports urban runoff and stormwater, or directly to receiving waters. The protocols in this fact sheet are intended to reduce pollutants leaving the site to the offsite drainage infrastructure or to receiving waters through proper on-site conveyance system operation and maintenance. The targeted constituents will vary depending on site characteristics and operations.

Approach

Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.
- ☐ Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.

Good Housekeeping

Illicit Connections and Discharges

- ☐ Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*

Targeted Constituents	
Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- ✓ Identify evidence of spills such as paints, discoloring, odors, etc.
- ✓ Record locations of apparent illegal discharges/illicit connections.
- ✓ Track flows back to potential discharges and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- ✓ Eliminate the discharge once the origin of flow is established.

- ☐ Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" or similar stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- ☐ Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.

Illegal Dumping

- ☐ Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- ☐ Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills); and
  - ✓ Responsible parties.
- ☐ Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- ☐ Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.



Preventative Maintenance

Catch Basins/Inlet Structures

- ☐ Staff should regularly inspect facilities to ensure compliance with the following:
  - ✓ Immediate repair of any deterioration threatening structural integrity.
  - ✓ Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Prioritize storm drain inlets; clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Wildlife. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Army Corps of Engineers and USFWS.



Spill Response and Prevention Procedures

- Keep your spill prevention control plan up-to-date.

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.



Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- Train employees and subcontractors in proper hazardous waste management.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - ✓ OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - ✓ OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
  - ✓ Procedural training (field screening, sampling, smoke/dye testing, TV inspection).



Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for drainage system maintenance, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Keep accurate logs of illicit connections, illicit discharges, and illegal dumping into the storm drain system including how wastes were cleaned up and disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Limitations and Work-Arounds

Provided below are typical limitations and recommended "work-arounds" for drainage system maintenance:

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.

  - ✓ Perform all maintenance onsite and do not flush accumulated material downstream to private property or riparian habitats.

- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, and liquid/sediment disposal.

  - ✓ Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.

- Regulations may include adoption of substantial penalties for illegal dumping and disposal.

  - ✓ Do not dump illegal materials anywhere onsite.

  - ✓ Identify illicit connections, illicit discharge, and illegal dumping.

  - ✓ Cleanup spills immediately and properly dispose of wastes.

- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the sanitary sewer system.

  - ✓ Collect all materials and pollutants accumulated in drainage system and dispose of according to local regulations.

  - ✓ Install debris excluders in areas with a trash TMDL.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital costs will vary substantially depending on the size of the facility and characteristics of the drainage system. Significant capital costs may be associated with purchasing water trucks, vacuum trucks, and any other necessary cleaning equipment or improving the drainage infrastructure to reduce the potential .

- Developing and implementing a site specific drainage system maintenance plan will require additional capital if a similar program is not already in place.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.
- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Supplemental Information

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing re-suspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used if allowed or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

Knox County Tennessee *Stormwater Management Manual* Chapter 5 Drainage System Maintenance, 2008. Available online at: http://www.knoxcounty.org/stormwater/manual/Volume%201/knoxco_swmm_v1_chap5_jan2008.pdf.

US EPA. Storm Drain System Cleaning, 2012. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=102.

Efficient Irrigation SD-12



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING

– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Maintenance Bays & Docks SD-31



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Several measures can be taken to prevent operations at maintenance bays and loading docks from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the stormwater conveyance system.

Approach

In designs for maintenance bays and loading docks, containment is encouraged. Preventative measures include overflow containment structures and dead-end sumps. However, in the case of loading docks from grocery stores and warehouse/distribution centers, engineered infiltration systems may be considered.

Suitable Applications

Appropriate applications include commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for vehicle maintenance and repair are governed by Building and Fire Codes, and by current local agency ordinances, and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code requirements.

Designing New Installations

Designs of maintenance bays should consider the following:

- Repair/maintenance bays and vehicle parts with fluids should be indoors; or designed to preclude urban run-on and runoff.
- Repair/maintenance floor areas should be paved with Portland cement concrete (or equivalent smooth impervious surface).

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- Repair/maintenance bays should be designed to capture all wash water leaks and spills. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and wash-down waters form entering the storm drain system. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

- Other features may be comparable and equally effective.

The following designs of loading/unloading dock areas should be considered:

- Loading dock areas should be covered, or drainage should be designed to preclude urban run-on and runoff.

- Direct connections into storm drains from depressed loading docks (truck wells) are prohibited.

- Below-grade loading docks from grocery stores and warehouse/distribution centers of fresh food items should drain through water quality inlets, or to an engineered infiltration system, or an equally effective alternative. Pre-treatment may also be required.

- Other features may be comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Trash Storage Areas SD-32

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Attachment F
Infiltration Report

October 15, 2021

Black Creek Group
4675 MacArthur Court, Suite 625
Newport Beach, California 92660

Attention: Mr. Chris Sanford
Senior Vice President

Project No.: **21G209-2**

Subject: **Results of Infiltration Testing**
Proposed Warehouse Development
12459 Arrow Route
Rancho Cucamonga, California

Reference: Geotechnical Investigation, Proposed Warehouse Development, 12459 Arrow Route, Rancho Cucamonga, California, prepared by Southern California Geotechnical, Inc. (SCG) for Black Creek Group, SCG Project No. 21G209-1, dated October 15, 2021.

Mr. Sanford:

In accordance with your request, we have conducted infiltration testing at the subject site. We are pleased to present this report summarizing the results of the infiltration testing and our design recommendations.

Scope of Services

The scope of services performed for this project was in general accordance with our Proposal No. 21P370, dated August 12, 2021. The scope of services included site reconnaissance, subsurface exploration, field testing, and engineering analysis to determine the infiltration rates of the on-site soils. The infiltration testing was performed in general accordance with the guidelines published in the Riverside County – Low Impact Development BMP Design Handbook – Section 2.3 of Appendix A, prepared for the Riverside County Department of Environmental Health (RCDEH), dated December, 2013. The San Bernardino County standards defer to the guidelines published by the RCDEH.

Site and Project Description

The site is located at the southwest corner of Arrow Route and Juneberry Drive in Rancho Cucamonga, California. The site is bounded to the north by Arrow Route, to the west by an automobile auction facility, to the south by a railroad easement, and to the east by existing commercial/industrial buildings and Juneberry Drive. The general location of the site is illustrated on the Site Location Map, enclosed as Plate 1 of this report.

The site consists of an L-shaped area, 94.08± acres in size. Based on our visit to the site, the site is being utilized as a steel manufacturing facility operated by CMC Steel. Large portions of the

site appear to be inactive, particularly the southern area of the property. The northern area of the site still appears to be in an active manufacturing condition.

The northwest portion of the site is currently being utilized for scrap metal and raw material storage. Four contiguous, one- or two-story industrial buildings are located in this area. The southwest portion of the site contains a large melt shop building that was previously utilized to melt down scrap metal and raw materials. The areas around this building include conveyors, ventilation ducting, large open areas for materials storage, railroad spurs and areas of pavement. Large stockpiles of sand/gravel and crushed concrete are also present in this area. The southeast portion of the site contains a large furnace building, cooling tower, and structural steel and rebar manufacturing facility. Several below-grade concrete pits are located in this area of the site. Several areas used for materials storage are also present around the buildings associated with the furnace building. The northeast portion of the site was previously utilized for structural steel and re-bar storage. Two single-story industrial structures are present in this area of the site. Ground surface cover throughout the majority of the site consists of asphaltic concrete pavements and Portland cement concrete pavements. The pavements exhibit moderate to severe distress, with cracking and potholes throughout. Several rows of large trees are present along the drive lanes in the northern and central regions of the site.

Detailed topographic information was not available at the time of this report. However, based on topographic information obtained from Google Earth, the site topography ranges from 1,167± to 1,127± feet msl in the northeastern and southwestern portions of the site, respectively. Overall, the site slopes gently toward the south with an average gradient of approximately 1 to 2 percent.

Proposed Development

Based on a conceptual site plan (Scheme 6) provided to our office by the client, the site will be developed with two (2) warehouses. Building 1 will be located in the western area of the site and will be 1,366,140± ft² in size. Building 2 will be located in the eastern area of the site and will be 549,560± ft² in size. Dock-high doors will be constructed along portions of the east and west building walls for Building 1 and along portions of the north and south building walls for Building 2. The buildings will be surrounded by asphaltic concrete pavements in the parking and drive lanes, Portland cement concrete pavements in the loading dock areas, and limited areas of concrete flatwork and landscape planters throughout.

Based on our conversations with representatives of Thienes Engineering, Inc., the project civil engineer, the proposed development will include on-site stormwater infiltration. The infiltration system will consist of four (4) areas of below-grade infiltration chambers located in the southwest, south-central, and southeastern areas of the site. The bottom of the infiltration chambers will be approximately 12 feet below the existing site grades.

Concurrent Study

SCG concurrently conducted a geotechnical investigation at the subject site, referenced above. As a part of this study, twenty-four (24) borings were advanced to depths of 10 to 25± feet below the existing site grades. Artificial fill and possible fill soils were encountered beneath the existing pavements at all of the boring locations, extending to depths of 2½ to 8½± feet below the existing site grades. The artificial fill and possible fill soils generally consist of loose to very dense

gravelly fine to coarse sands, silty fine to coarse sands, and well-graded sands with varying gravel content. Trace quantities of slag were occasionally encountered within the fill soils. Native alluvium was encountered beneath the artificial fill soils at all of the boring locations, extending to at least the maximum depth explored of 25± feet below existing site grades. The alluvium generally consisted of medium dense to very dense, silty fine to coarse sands, fine to coarse sands, and gravelly fine to coarse sands.

Groundwater

Free water was not encountered during the drilling of any of the borings. Based on the lack of any water within the borings, and the moisture contents of the recovered soil samples, the static groundwater table is considered to have existed at a depth in excess of 25± feet at the time of the subsurface exploration.

As part of our research, we reviewed readily available groundwater data in order to determine regional groundwater depths. The primary reference used to determine the groundwater depths in the subject site area is the California Department of Water Resources website, http://www.water.ca.gov/waterdatalibrary/. The nearest monitoring well is located approximately 2.3 miles northeast from the site. Water level readings within these monitoring wells indicate high groundwater levels of 575± feet below site grades (June 2012).

Subsurface Exploration

Scope of Exploration

The subsurface exploration conducted for the infiltration testing consisted of eight (8) infiltration test borings, advanced to depths of 7 to 12± feet below the existing site grades. The infiltration borings were advanced using a truck-mounted drilling rig, equipped with 8-inch-diameter hollow-stem augers and were logged during drilling by a member of our staff. The approximate locations of the infiltration test borings (identified as I-1 and I-8) are indicated on the Infiltration Test Location Plan, enclosed as Plate 2 of this report.

Upon the completion of the infiltration borings, the bottom of each test boring was covered with 2± inches of clean ¾-inch gravel. A sufficient length of 3-inch-diameter perforated PVC casing was then placed into each test hole so that the PVC casing extended from the bottom of the test hole to the ground surface. Clean ¾-inch gravel was then installed in the annulus surrounding the PVC casing.

Geotechnical Conditions

Artificial fill soils were encountered beneath the pavements at most of the infiltration boring locations, extending to depths of 3 to 10½± below the existing site grades. The fill soils generally consist of medium dense silty fine sands, silty fine to medium sands, and silty fine to coarse sands with varying amount of fine gravel content. The fill soils possess a disturbed mottled appearance and some metal debris resulting in their classification as artificial fill. It should be noted that a concrete slab was encountered at a depth of 7± feet at Infiltration Boring No. I-4. Refusal conditions were encountered at 7± feet due to the concrete slab. Native alluvial soils were encountered beneath the pavements or beneath the fill soils at all of the infiltration boring

locations, extending to at least the maximum depth explored of 12± feet below the existing site grades. The alluvial soils generally consist of medium dense silty sands and gravelly sands. The Boring Logs, which illustrate the conditions encountered at the boring locations, are included with this report.

Infiltration Testing

As previously mentioned, the infiltration testing was performed in general accordance with the guidelines published in Riverside County – Low Impact Development BMP Design Handbook – Section 2.3 of Appendix A, which apply to San Bernardino County.

Pre-soaking

In accordance with the county infiltration standards for sandy soils, all infiltration test borings were pre-soaked 2 hours prior to the infiltration testing or until all of the water had percolated through the test holes. The pre-soaking process consisted of filling test borings by inverting a full 5-gallon bottle of clear water supported over each hole so that the water flow into the hole holds constant at a level at least 5 times the hole's radius above the gravel at the bottom of each hole. Pre-soaking was completed after all of the water had percolated through the test holes.

Infiltration Testing

Following the pre-soaking process of the infiltration test borings, SCG performed the infiltration testing. Each test hole (with exception of I-4) was filled with water to a depth of at least 5 times the hole's radius above the gravel at the bottom of the test holes. In accordance with the Riverside County guidelines, since "sandy soils" were encountered at the bottom of both of the infiltration test borings (where 6 inches of water infiltrated into the surrounding soils for two consecutive 25-minute readings), readings were taken at 10-minute intervals for a total of 1 hour at each test location. After each reading, water was added to the borings so that the depth of the water was at least 5 times the radius of the hole. The water level readings are presented on the spreadsheets enclosed with this report. The infiltration rates for each of the timed intervals are also tabulated on the spreadsheets.

The infiltration rates from the test are tabulated in inches per hour. In accordance with the typically accepted practice, it is recommended that the most conservative reading from the latter part of the infiltration tests be used as the design infiltration rate. The rates are summarized below:

Infiltration Test No.	Depth (feet)	Soil Description	Infiltration Rate (inches/hour)
I-1	12	Silty fine to medium Sand	10.0
I-2	12	Silty fine to medium Sand	12.5
I-3	12	fine to medium Sandy Silt	1.2
I-4	7	Gravelly fine to coarse Sand, trace Silt	Not Tested
I-5	12	Silty fine to coarse Sand	4.6
I-6	12	Silty fine to medium Sand, trace coarse Sand	2.5
I-7	12	Silty fine to medium Sand	10.3
I-8	12	Silty fine to medium Sand, trace coarse Sand	12.7

Laboratory Testing

Moisture Content

The moisture contents for the recovered soil samples within the borings were determined in accordance with ASTM D-2216 and are expressed as a percentage of the dry weight. These test results are presented on the Boring Logs.

Grain Size Analysis

The grain size distribution of selected soils collected from the base of each infiltration test boring have been determined using a range of wire mesh screens. These tests were performed in general accordance with ASTM D-422 and/or ASTM D-1140. The weight of the portion of the sample retained on each screen is recorded and the percentage finer or coarser of the total weight is calculated. The results of these tests are presented on Plates C-1 and C-8 of this report.

Design Recommendations

Seven (7) infiltration tests were performed at the subject site. As noted above, the infiltration rates at these locations vary from 1.2 to 12.7 inches per hour. The major factors affecting the difference in infiltration rate at these borings is the presence of silt in the soils at the test depths. Based on the infiltration test results, we recommend the following infiltration rates:

Infiltration System	Location	Infiltration Rate (in/hr)
"A"	Southwest	10.0
"B"	South-Central	1.0
"C"	East	2.5
"D"	Southeast	10.0

We recommend that a representative from the geotechnical engineer be on-site during the construction of the proposed infiltration system to identify the soil classification at the base of the system. It should be confirmed that the soils at the base of the proposed infiltration system correspond with those presented in this report to ensure that the performance of the system will be consistent with the rate reported herein.

The design of the storm water infiltration system should be performed by the project civil engineer, in accordance with the City of Rancho Cucamonga and/or County of San Bernardino guidelines. It is recommended that the system be constructed so as to facilitate removal of silt and clay, or other deleterious materials from any water that may enter the system. The presence of such materials would decrease the effective infiltration rate. **It is recommended that the project civil engineer apply an appropriate factor of safety. The infiltration rate recommended above is based on the assumption that only clean water will be introduced to the subsurface profile. Any fines, debris, or organic materials could significantly impact the infiltration rate.** It should be noted that the recommended infiltration rates are based on infiltration testing at eight (8) discrete locations and that the overall infiltration rate of the proposed infiltration system could vary considerably.

Infiltration Rate Considerations

The infiltration rates presented herein was determined in accordance with the San Bernardino County guidelines and are considered valid only for the time and place of the actual test. Varying subsurface conditions will exist in other areas of the site, which could alter the recommended infiltration rates presented above. The infiltration rates will decline over time between maintenance cycles as silt or clay particles accumulate on the BMP surface. The infiltration rate is highly dependent upon a number of factors, including density, silt and clay content, grainsize distribution throughout the range of particle sizes, and particle shape. Small changes in these factors can cause large changes in the infiltration rates.

Infiltration rates are based on unsaturated flow. As water is introduced into soils by infiltration, the soils become saturated and the wetting front advances from the unsaturated zone to the saturated zone. Once the soils become saturated, infiltration rates become zero, and water can only move through soils by hydraulic conductivity at a rate determined by pressure head and soil permeability. Changes in soil moisture content will affect the infiltration rate. Infiltration rates should be expected to decrease until the soils become saturated. Soil permeability values will then govern groundwater movement. Permeability values may be on the order of 10 to 20 times less than infiltration rates. The system designer should incorporate adequate factors of safety and allow for overflow design into appropriate traditional storm drain systems, which would transport storm water off-site.

Construction Considerations

The infiltration rates presented in this report are specific to the tested locations and tested depths. Infiltration rates can be significantly reduced if the soils are exposed to excessive disturbance or compaction during construction. Compaction of the soils at the bottom of the infiltration system can significantly reduce the infiltration ability of the basins. Therefore, the subgrade soils within proposed infiltration system areas should not be over-excavated, undercut or compacted in any

significant manner. **It is recommended that a note to this effect be added to the project plans and/or specifications.**

We recommend that a representative from the geotechnical engineer be on-site during the construction of the proposed infiltration systems to identify the soil classification at the base of each system. It should be confirmed that the soils at the base of the proposed infiltration systems correspond with those presented in this report to ensure that the performance of the systems will be consistent with the rates reported herein.

We recommend that scrapers and other rubber-tired heavy equipment not be operated on the basin bottom, or at levels lower than 2 feet above the bottom of the system, particularly within basins. As such, the bottom 24 inches of the infiltration systems should be excavated with non-rubber-tired equipment, such as excavators.

Basin Maintenance

The proposed project may include infiltration basins. Water flowing into these basins will carry some level of sediment. Wind-blown sediments and erosion of the basin side walls will also contribute to sediment deposition at the bottom of the basin. This layer has the potential to significantly reduce the infiltration rate of the basin subgrade soils. Therefore, a formal basin maintenance program should be established to ensure that these silt and clay deposits are removed from the basin on a regular basis. Appropriate vegetation on the basin sidewalls and bottom may reduce erosion and sediment deposition.

Basin maintenance should also include measures to prevent animal burrows, and to repair any burrows or damage caused by such. Animal burrows in the basin sidewalls can significantly increase the risk of erosion and piping failures.

Location of Infiltration Systems

The use of on-site storm water infiltration systems carries a risk of creating adverse geotechnical conditions. Increasing the moisture content of the soil can cause the soil to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. Overlying structures and pavements in the infiltration area could potentially be damaged due to saturation of the subgrade soils. **The proposed infiltration systems for this site should be located at least 25 feet away from any structures, including retaining walls.** Even with this provision of locating the infiltration system at least 25 feet from the building(s), it is possible that infiltrating water into the subsurface soils could have an adverse effect on the proposed or existing structures. It should also be noted that utility trenches which happen to collect storm water can also serve as conduits to transmit storm water toward the structure, depending on the slope of the utility trench. Therefore, consideration should also be given to the proposed locations of underground utilities which may pass near the proposed infiltration system.

The infiltration system designer should also give special consideration to the effect that the proposed infiltration systems may have on nearby subterranean structures, open excavations, or descending slopes. In particular, infiltration systems should not be located near the crest of descending slopes, particularly where the slopes are comprised of granular soils. Such systems

will require specialized design and analysis to evaluate the potential for slope instability, piping failures and other phenomena that typically apply to earthen dam design. This type of analysis is beyond the scope of this infiltration test report, but these factors should be considered by the infiltration system designer when locating the infiltration systems.

General Comments

This report has been prepared as an instrument of service for use by the client in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, structural engineer, and/or civil engineer. The design of the proposed storm water infiltration system is the responsibility of the civil engineer. The role of the geotechnical engineer is limited to determination of infiltration rate only. By using the design infiltration rate contained herein, the civil engineer agrees to indemnify, defend, and hold harmless the geotechnical engineer for all aspects of the design and performance of the proposed storm water infiltration system. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur.

The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between boring locations and testing depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted. The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

Closure

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

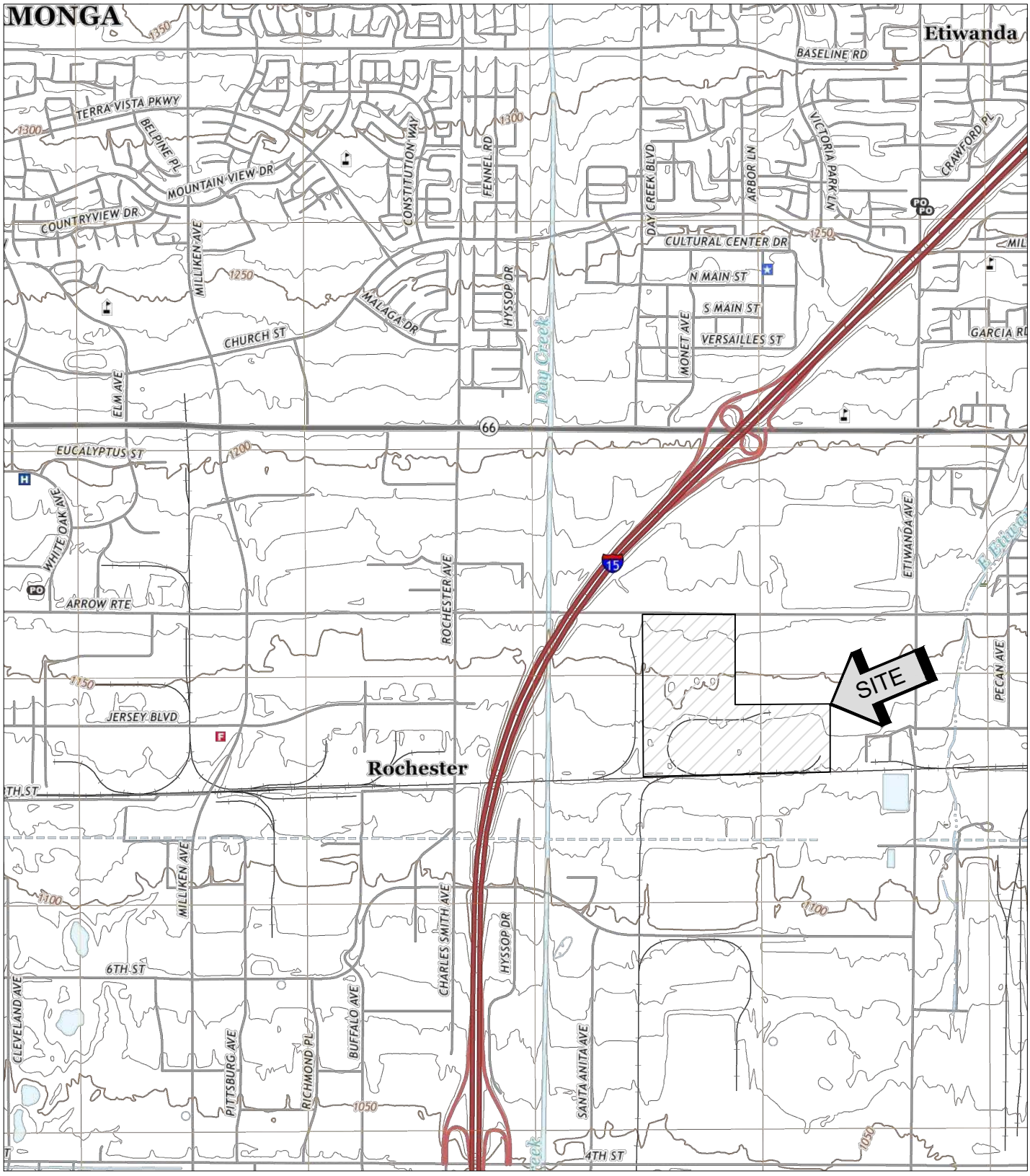
SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

Daryl Kas, CEG 2467
Senior Geologist

Gregory K. Mitchell, GE 2364
Principal Engineer

Distribution: (1) Addressee

Enclosures: Plate 1 - Site Location Map
Plate 2 - Infiltration Test Location Plan
Boring Log Legend and Logs (10 pages)
Infiltration Test Results Spreadsheets (7 pages)
Grain Size Distribution Graphs (8 pages)



SOURCE: USGS TOPOGRAPHIC MAP OF THE GUASTI QUADRANGLE, SAN BERNARDINO COUNTY, CALIFORNIA, 2018.

SITE LOCATION MAP

PROPOSED WAREHOUSE DEVELOPMENT

RANCHO CUCAMONGA, CALIFORNIA

SCALE: 1" = 2000'	
DRAWN: RB CHKD: GKM	
SCG PROJECT 21G209-2	
PLATE 1	

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL



NORTH

SoCalGeo

GEOTECHNICAL LEGEND

APPROXIMATE INFILTRATION LOCATION

NOTE: AERIAL PHOTO PROVIDED BY GOOGLE EARTH.

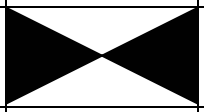
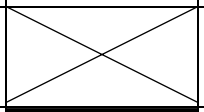
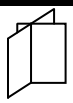
INFILTRATION TEST LOCATION PLAN

PROPOSED WAREHOUSE DEVELOPMENT

RANCHO CUCAMONGA, CALIFORNIA

SCALE: 1" = 250'	SOUTHERN CALIFORNIA GEOTECHNICAL
DRAWN: DRK CHKD: GKM	
SCG PROJECT 21G209-2	
PLATE 2	

BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

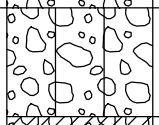
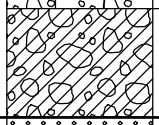
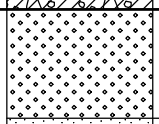
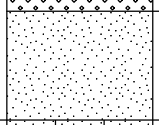
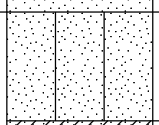
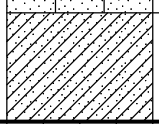
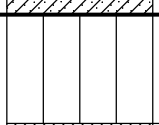
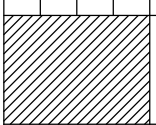
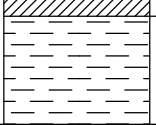
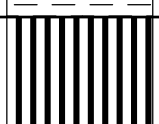
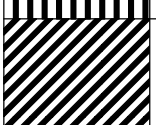
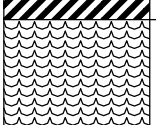
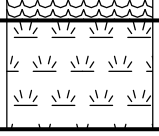
LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-1

JOB NO.: 21G209-2
PROJECT: Proposed Warehouse Development
LOCATION: Rancho Cucamonga, CA

DRILLING DATE: 9/14/21
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
		18			FILL: Brown Silty fine Sand, trace medium to coarse Sand, trace fine Gravel, medium dense-damp		4					
		13			FILL: Brown fine Sand, trace Silt, trace medium to coarse Sand, trace fine Gravel, medium dense-damp		5					
5		15			@ 6 feet, trace metal fragments		5					
		11			@ 8½ feet, no metal fragments		5					
10		12			ALLUVIUM: Brown SIlty fine to medium Sand, medium dense-damp		5					
					Boring Terminated at 12'							

TBL 21G209-2.GPJ SOCALGEO.GDT 10/15/21

TEST BORING LOG **PLATE B-1**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-2

JOB NO.: 21G209-2
PROJECT: Proposed Warehouse Development
LOCATION: Rancho Cucamonga, CA

DRILLING DATE: 9/14/21
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
		41			FILL: Brown Silty fine to coarse Sand, mottled, trace fine Gravel, dense-damp		12					
5		75/9"			FILL: Brown Gravelly fine to coarse Sand, mottled, little Silt, very dense-damp		8					
		50/3"										@ 6 feet, no recovery
		14			ALLUVIUM: Brown Silty fine to medium Sand, medium dense-damp		9					
10		10					8					
					Boring Terminated at 12'							

TBL 21G209-2.GPJ SOCALGEO.GDT 10/15/21

TEST BORING LOG **PLATE B-2**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-3

JOB NO.: 21G209-2
PROJECT: Proposed Warehouse Development
LOCATION: Rancho Cucamonga, CA

DRILLING DATE: 9/14/21
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
		7			FILL: Brown Silty fine Sand, trace medium Sand, loose-damp		12					
		28			ALLUVIUM: Brown Gray Gravelly fine to coarse Sand, occasional Cobbles, trace Silt, medium dense-dry		1					
5		10			Brown Silty fine to coarse Sand, trace fine Gravel, medium dense-damp		5					
		14			Light Brown Silty fine Sand, trace medium Sand, medium dense-damp		7					
10		19			Light Brown fine to medium Sandy Silt, medium dense-moist		16					
					Boring Terminated at 12'							

TBL 21G209-2.GPJ SOCALGEO.GDT 10/15/21

TEST BORING LOG **PLATE B-3**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-4

JOB NO.: 21G209-2
PROJECT: Proposed Warehouse Development
LOCATION: Rancho Cucamonga, CA

DRILLING DATE: 9/14/21
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					8½± inches Portland Cement Concrete with rebar							
		77/11"			FILL: Gray Gravelly fine to coarse Sand, trace Silt, very dense-damp to moist		11					
		87/11"					4					
5												
		80/10"			@ 6 feet, no recovery							
					Refusal at 7' due to Concrete							

TBL 21G209-2.GPJ SOCALGEO.GDT 10/15/21

TEST BORING LOG **PLATE B-4**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-5

JOB NO.: 21G209-2
PROJECT: Proposed Warehouse Development
LOCATION: Rancho Cucamonga, CA

DRILLING DATE: 9/14/21
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
					ALLUVIUM: Brown Silty fine Sand, trace medium Sand, loose to medium dense-damp							
		13					5					
5												
		8					8					
10												
		11			Brown Silty fine to coarse Sand, medium dense-damp		6					
					Boring Terminated at 12'							

TBL 21G209-2.GPJ SOCALGEO.GDT 10/15/21

TEST BORING LOG **PLATE B-5**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-6

JOB NO.: 21G209-2
PROJECT: Proposed Warehouse Development
LOCATION: Rancho Cucamonga, CA

DRILLING DATE: 9/14/21
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
5		10			ALLUVIUM: Brown Silty fine Sand, trace medium to coarse Sand, medium dense-damp		5					
		14					6					
10		28			Brown Silty fine to medium Sand, trace coarse Sand, medium dense-damp		5					
					Boring Terminated at 12'							

TBL 21G209-2.GPJ SOCALGEO.GDT 10/15/21

TEST BORING LOG **PLATE B-6**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-7

JOB NO.: 21G209-2
PROJECT: Proposed Warehouse Development
LOCATION: Rancho Cucamonga, CA

DRILLING DATE: 9/14/21
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
5		22			FILL: Brown Silty fine Sand, trace medium to coarse Sand, trace fine Gravel, medium dense-damp		6					
10		20			ALLUVIUM:Brown fine to coarse Sand, trace Silt, trace to little fine to coarse Gravel, medium dense-damp		3					
		15			Light Brown Silty fine to medium Sand, trace calcareous veining, medium dense-moist		13					
					Boring Terminated at 12'							

TBL 21G209-2.GPJ SOCALGEO.GDT 10/15/21

TEST BORING LOG

PLATE B-7

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. I-8

JOB NO.: 21G209-2
PROJECT: Proposed Warehouse Development
LOCATION: Rancho Cucamonga, CA

DRILLING DATE: 9/14/21
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Ryan Bremer

WATER DEPTH: Dry
CAVE DEPTH:
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	ORGANIC CONTENT (%)	COMMENTS
5		8			FILL: Brown Silty fine to medium Sand, trace Silt, trace coarse Sand, loose-damp		9					
		16			ALLUVIUM: Brown fine to medium Sand, trace Silt, trace coarse Sand, medium dense-damp		7					
10		19			Brown Silty fine to medium Sand, trace coarse Sand, medium dense-damp		5					
					Boring Terminated at 12'							

TBL 21G209-2.GPJ SOCALGEO.GDT 10/15/21

TEST BORING LOG

PLATE B-8

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse Development
Project Location	Rancho Cucamonga, California
Project Number	21G209-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	12.20	(ft)

Infiltration Test Hole	I-1

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	11:08 AM	25.00	10.50	24.00	YES	SANDY SOILS
	Final	11:33 AM		12.50			
2	Initial	11:33 AM	25.00	10.50	24.00	YES	SANDY SOILS
	Final	11:58 AM		12.50			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	12:01 PM	10.00	10.50	1.30	1.05	12.82
	Final	12:11 PM		11.80			
2	Initial	12:11 PM	10.00	10.50	1.27	1.07	12.37
	Final	12:21 PM		11.77			
3	Initial	12:21 PM	10.00	10.50	1.17	1.12	10.95
	Final	12:31 PM		11.67			
4	Initial	12:31 PM	10.00	10.50	1.13	1.14	10.42
	Final	12:41 PM		11.63			
5	Initial	12:41 PM	10.00	10.50	1.11	1.15	10.16
	Final	12:51 PM		11.61			
6	Initial	12:51 PM	10.00	10.50	1.10	1.15	10.03
	Final	1:01 PM		11.60			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse Development
Project Location	Rancho Cucamonga, California
Project Number	21G209-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	12.25	(ft)

Infiltration Test Hole	I-2

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	4:00 PM	25.00	10.80	24.00	YES	SANDY SOILS
	Final	4:25 PM		12.80			
2	Initial	4:25 PM	25.00	10.80	24.00	YES	SANDY SOILS
	Final	4:50 PM		12.80			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	4:52 PM	10.00	10.80	1.19	0.86	13.98
	Final	5:02 PM		11.99			
2	Initial	5:02 PM	10.00	10.80	1.19	0.86	13.98
	Final	5:12 PM		11.99			
3	Initial	5:12 PM	10.00	10.80	1.15	0.88	13.25
	Final	5:22 PM		11.95			
4	Initial	5:22 PM	10.00	10.80	1.16	0.87	13.43
	Final	5:32 PM		11.96			
5	Initial	5:32 PM	10.00	10.80	1.14	0.88	13.07
	Final	5:42 PM		11.94			
6	Initial	5:42 PM	10.00	10.80	1.11	0.90	12.55
	Final	5:52 PM		11.91			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

- Q = Infiltration Rate (in inches per hour)
- ΔH = Change in Height (Water Level) over the time interval
- r = Test Hole (Borehole) Radius
- Δt = Time Interval
- H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse Development
Project Location	Rancho Cucamonga, California
Project Number	21G209-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	12.40	(ft)

Infiltration Test Hole	I-3

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	10:05 AM	25.00	10.70	8.40	YES	SANDY SOILS
	Final	10:30 AM		11.40			
2	Initial	10:30 AM	25.00	10.70	6.12	YES	SANDY SOILS
	Final	10:55 AM		11.21			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	11:57 AM	10.00	10.70	0.29	1.56	2.02
	Final	12:07 PM		10.99			
2	Initial	12:07 PM	10.00	10.70	0.23	1.59	1.58
	Final	12:17 PM		10.93			
3	Initial	12:17 PM	10.00	10.70	0.20	1.60	1.36
	Final	12:27 PM		10.90			
4	Initial	12:27 PM	10.00	10.70	0.19	1.61	1.29
	Final	12:37 PM		10.89			
5	Initial	12:37 PM	10.00	10.70	0.19	1.61	1.29
	Final	12:47 PM		10.89			
6	Initial	12:47 PM	10.00	10.70	0.18	1.61	1.22
	Final	12:57 PM		10.88			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

- Q = Infiltration Rate (in inches per hour)
- ΔH = Change in Height (Water Level) over the time interval
- r = Test Hole (Borehole) Radius
- Δt = Time Interval
- H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse Development
Project Location	Rancho Cucamonga, California
Project Number	21G209-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	12.50	(ft)

Infiltration Test Hole	I-5

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	1:51 PM	25.00	10.50	21.60	YES	SANDY SOILS
	Final	2:16 PM		12.30			
2	Initial	2:16 PM	25.00	10.50	21.60	YES	SANDY SOILS
	Final	2:41 PM		12.30			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	2:46 PM	10.00	10.50	0.79	1.61	5.35
	Final	2:56 PM		11.29			
2	Initial	2:56 PM	10.00	10.50	0.78	1.61	5.27
	Final	3:06 PM		11.28			
3	Initial	3:06 PM	10.00	10.50	0.76	1.62	5.10
	Final	3:16 PM		11.26			
4	Initial	3:16 PM	10.00	10.50	0.72	1.64	4.78
	Final	3:26 PM		11.22			
5	Initial	3:26 PM	10.00	10.50	0.72	1.64	4.78
	Final	3:36 PM		11.22			
6	Initial	3:36 PM	10.00	10.50	0.70	1.65	4.62
	Final	3:46 PM		11.20			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse Development
Project Location	Rancho Cucamonga, California
Project Number	21G209-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	12.50	(ft)

Infiltration Test Hole	I-6

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	1:51 PM	25.00	10.50	15.60	YES	SANDY SOILS
	Final	2:16 PM		11.80			
2	Initial	2:16 PM	25.00	10.50	12.24	YES	SANDY SOILS
	Final	2:41 PM		11.52			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	2:46 PM	10.00	10.50	0.53	1.74	3.34
	Final	2:56 PM		11.03			
2	Initial	2:56 PM	10.00	10.50	0.47	1.77	2.92
	Final	3:06 PM		10.97			
3	Initial	3:06 PM	10.00	10.50	0.44	1.78	2.71
	Final	3:16 PM		10.94			
4	Initial	3:16 PM	10.00	10.50	0.41	1.80	2.51
	Final	3:26 PM		10.91			
5	Initial	3:26 PM	10.00	10.50	0.42	1.79	2.58
	Final	3:36 PM		10.92			
6	Initial	3:36 PM	10.00	10.50	0.41	1.80	2.51
	Final	3:46 PM		10.91			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

Q = Infiltration Rate (in inches per hour)
ΔH = Change in Height (Water Level) over the time interval
r = Test Hole (Borehole) Radius
Δt = Time Interval
H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse Development
Project Location	Rancho Cucamonga, California
Project Number	21G209-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	12.40	(ft)

Infiltration Test Hole: I-7

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	7:40 AM	25.00	10.40	21.96	YES	SANDY SOILS
	Final	8:05 AM		12.23			
2	Initial	8:05 AM	25.00	10.40	20.88	YES	SANDY SOILS
	Final	8:30 AM		12.14			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	8:31 AM	10.00	10.40	1.59	1.21	13.91
	Final	8:41 AM		11.99			
2	Initial	8:41 AM	10.00	10.40	1.54	1.23	13.23
	Final	8:51 AM		11.94			
3	Initial	8:51 AM	10.00	10.40	1.42	1.29	11.70
	Final	9:01 AM		11.82			
4	Initial	9:01 AM	10.00	10.40	1.35	1.33	10.86
	Final	9:11 AM		11.75			
5	Initial	9:11 AM	10.00	10.40	1.33	1.34	10.63
	Final	9:21 AM		11.73			
6	Initial	9:21 AM	10.00	10.40	1.30	1.35	10.29
	Final	9:31 AM		11.70			

Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

- Q = Infiltration Rate (in inches per hour)
- ΔH = Change in Height (Water Level) over the time interval
- r = Test Hole (Borehole) Radius
- Δt = Time Interval
- H_{avg} = Average Head Height over the time interval

INFILTRATION CALCULATIONS

Project Name	Proposed Warehouse Development
Project Location	Rancho Cucamonga, California
Project Number	21G209-2
Engineer	Sam Bergeland

Test Hole Radius	4	(in)
Test Depth	12.40	(ft)

Infiltration Test Hole	I-8

Soil Criteria Test

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (in)	Did 6 inches of water seep away in less than 25 minutes?	Sandy Soils or Non-Sandy Soils?
1	Initial	9:30 AM	25.00	10.40	22.20	YES	SANDY SOILS
	Final	9:55 AM		12.25			
2	Initial	9:55 AM	25.00	10.40	20.16	YES	SANDY SOILS
	Final	10:20 AM		12.08			

Test Data

Interval Number		Time	Time Interval (min)	Water Depth (ft)	Change in Water Level (ft)	Average Head Height (ft)	Infiltration Rate Q (in/hr)
1	Initial	10:21 AM	10.00	10.40	1.59	1.21	13.91
	Final	10:31 AM		11.99			
2	Initial	10:31 AM	10.00	10.40	1.55	1.23	13.37
	Final	10:41 AM		11.95			
3	Initial	10:41 AM	10.00	10.40	1.54	1.23	13.23
	Final	10:51 AM		11.94			
4	Initial	10:51 AM	10.00	10.40	1.51	1.25	12.84
	Final	11:01 AM		11.91			
5	Initial	11:01 AM	10.00	10.40	1.50	1.25	12.71
	Final	11:11 AM		11.90			
6	Initial	11:11 AM	10.00	10.40	1.50	1.25	12.71
	Final	11:21 AM		11.90			

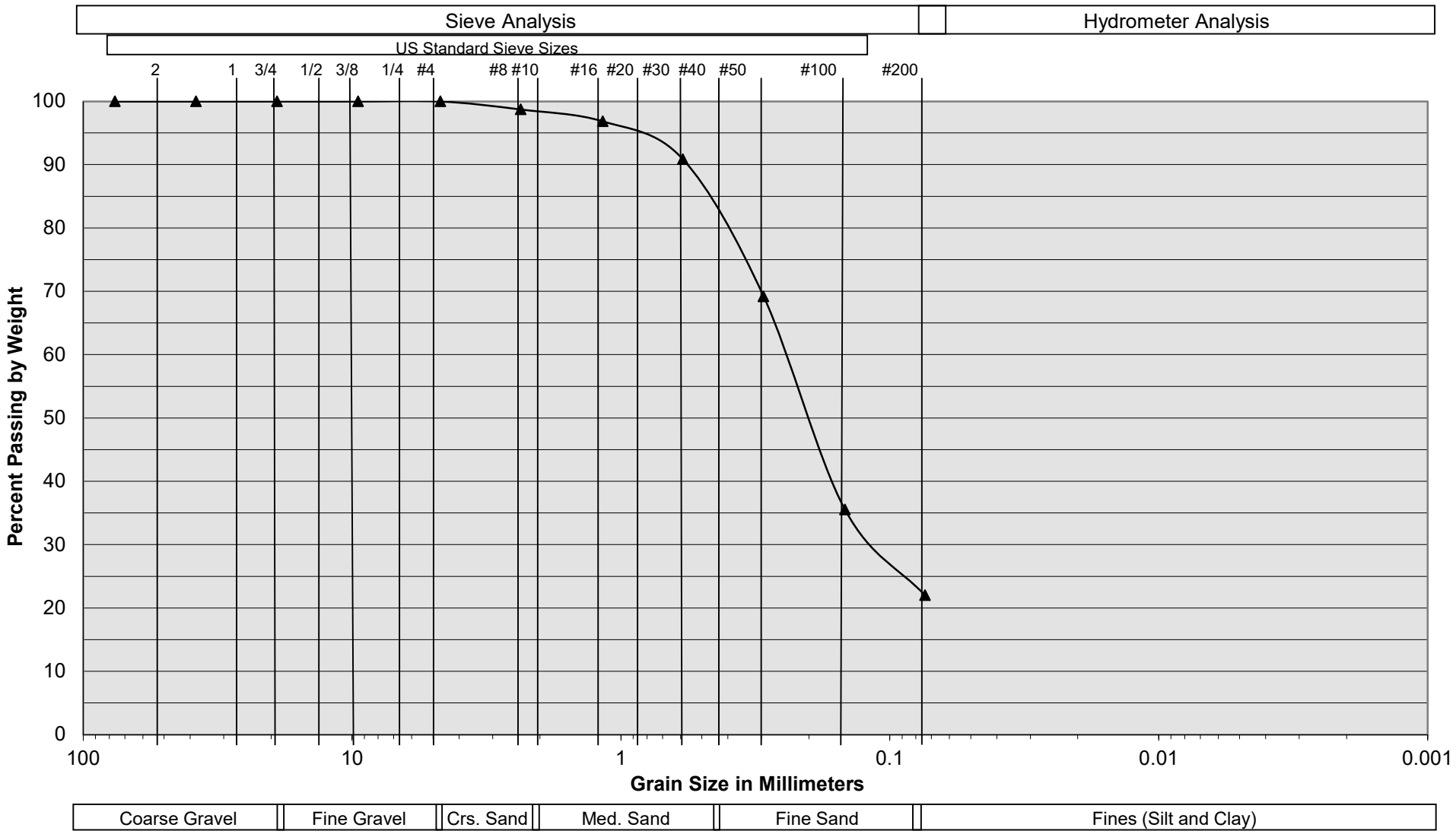
Per County Standards, Infiltration Rate calculated as follows:

$$Q = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

Where:

- Q = Infiltration Rate (in inches per hour)
- ΔH = Change in Height (Water Level) over the time interval
- r = Test Hole (Borehole) Radius
- Δt = Time Interval
- H_{avg} = Average Head Height over the time interval

Grain Size Distribution

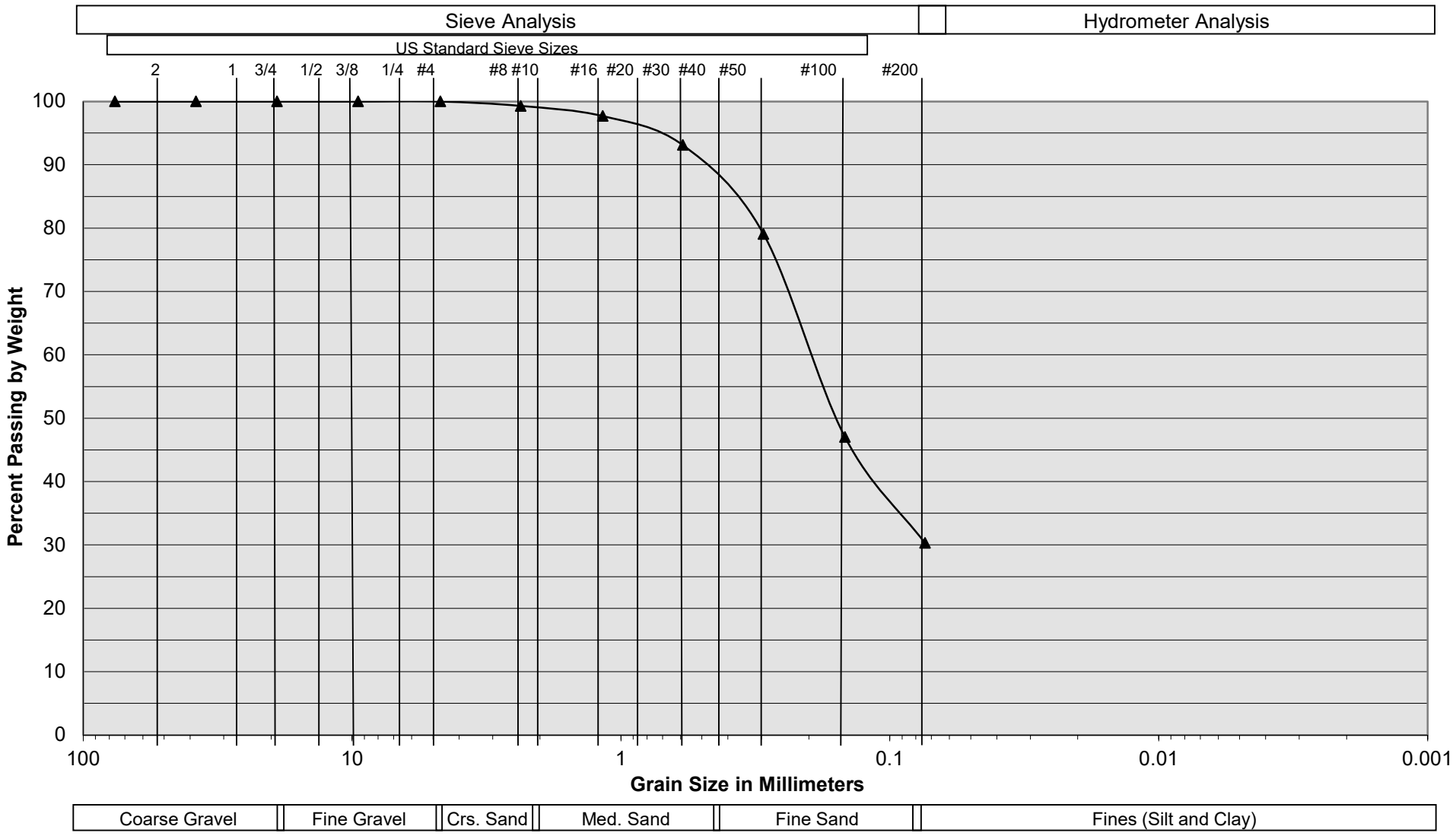


Sample Description	I-1 @ 10.5 feet
Soil Classification	Brown Silty fine to medium Sand

Proposed Warehouse Development
Rancho Cucamonga, CA
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PLATE C- 1

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Grain Size Distribution

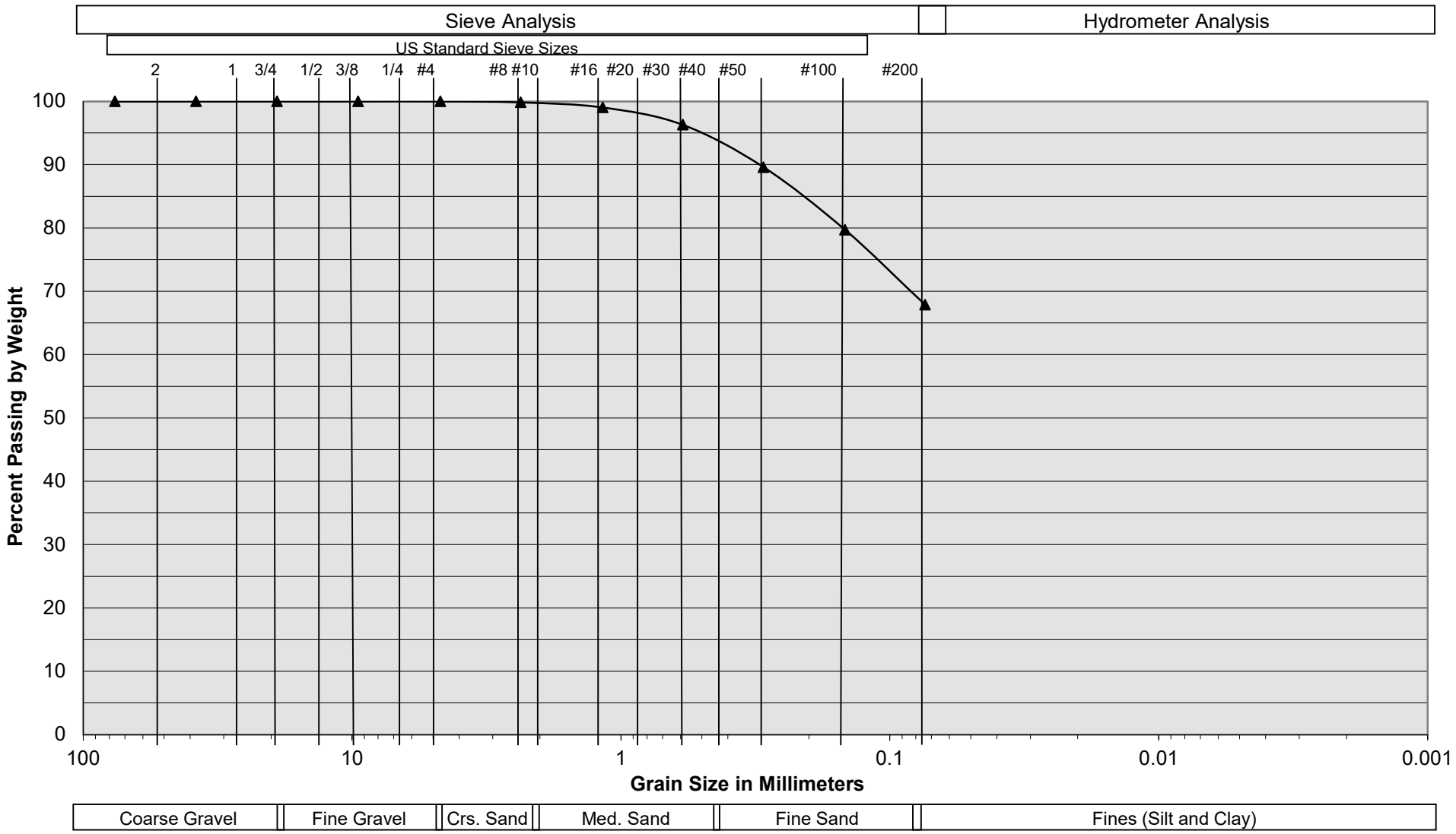


Sample Description	I-2 @ 10.5 feet
Soil Classification	Brown Silty fine to medium Sand

Proposed Warehouse Development
Rancho Cucamonga, CA
Project No. 21G209-2
PLATE C- 2

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Grain Size Distribution

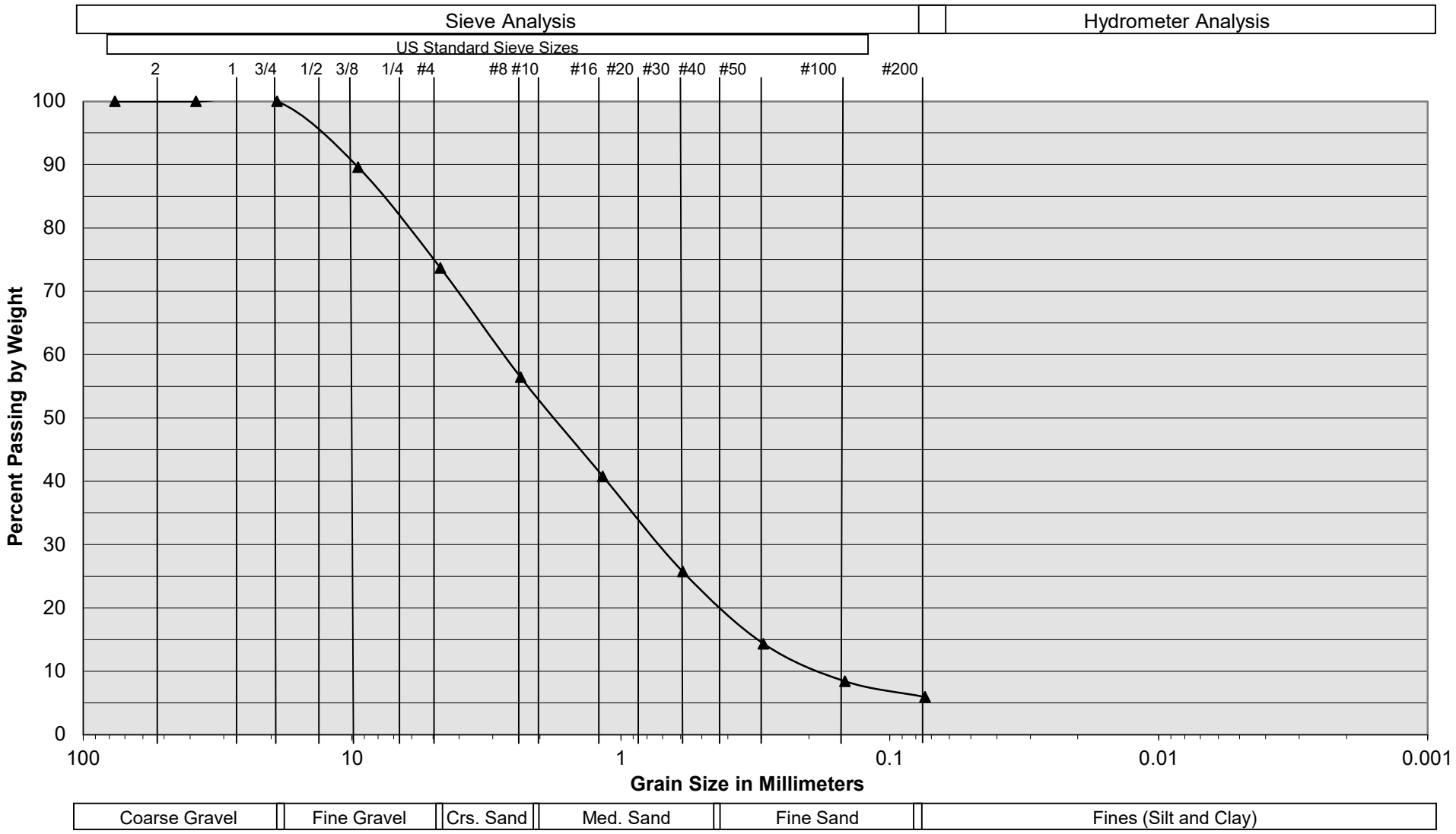


Sample Description	I-3 @ 10.5 feet
Soil Classification	Light Brown fine to medium Sandy Silt

Proposed Warehouse Development
Rancho Cucamonga, CA
Project No. 21G209
PLATE C- 3

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Grain Size Distribution

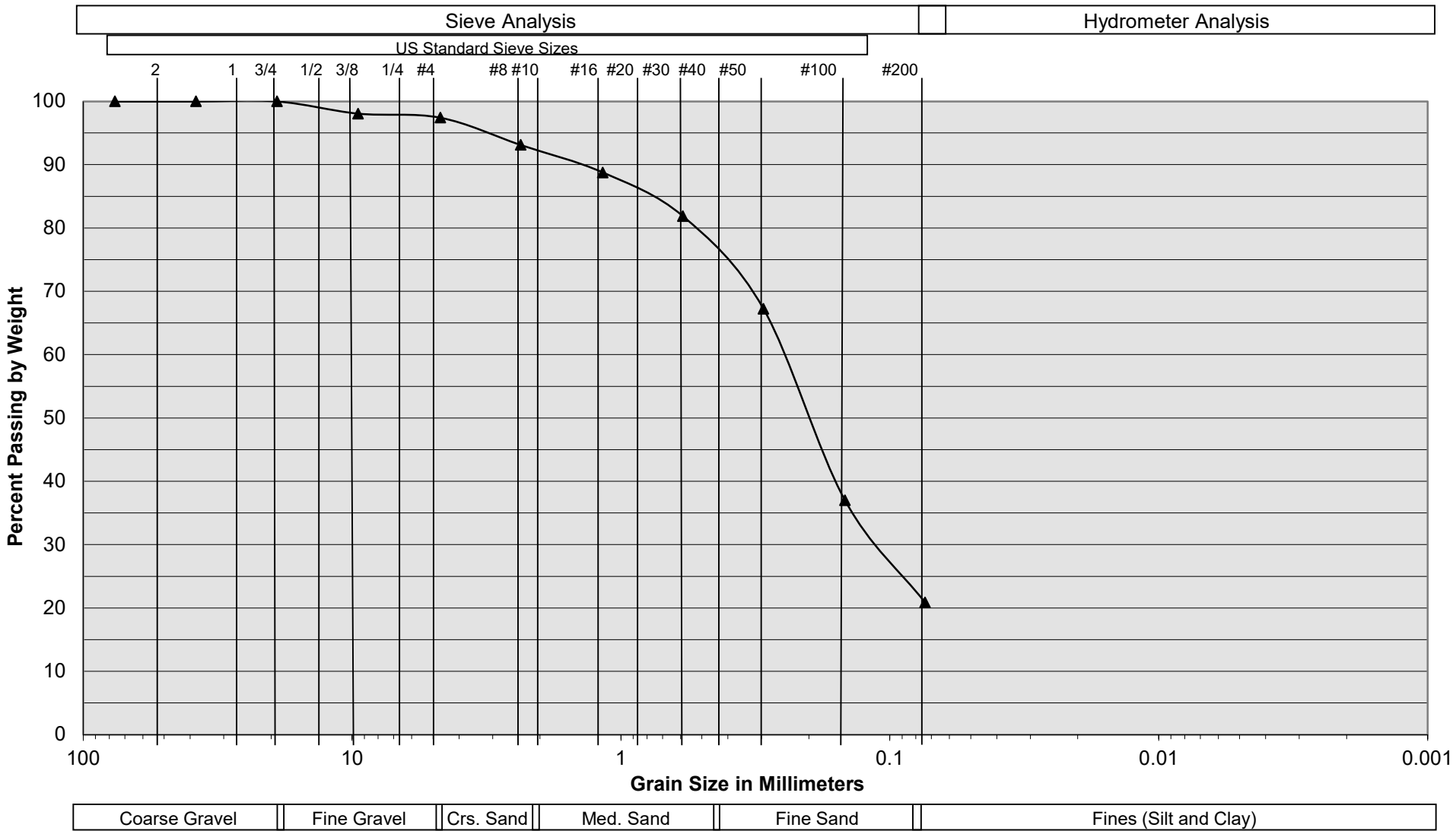


Sample Description	I-4 @ 3.5 feet
Soil Classification	Gray Gravelly fine to coarse Sand, trace Silt

Proposed Warehouse Development
Rancho Cucamonga, CA
Project No. 21G209-2
PLATE C- 4

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution

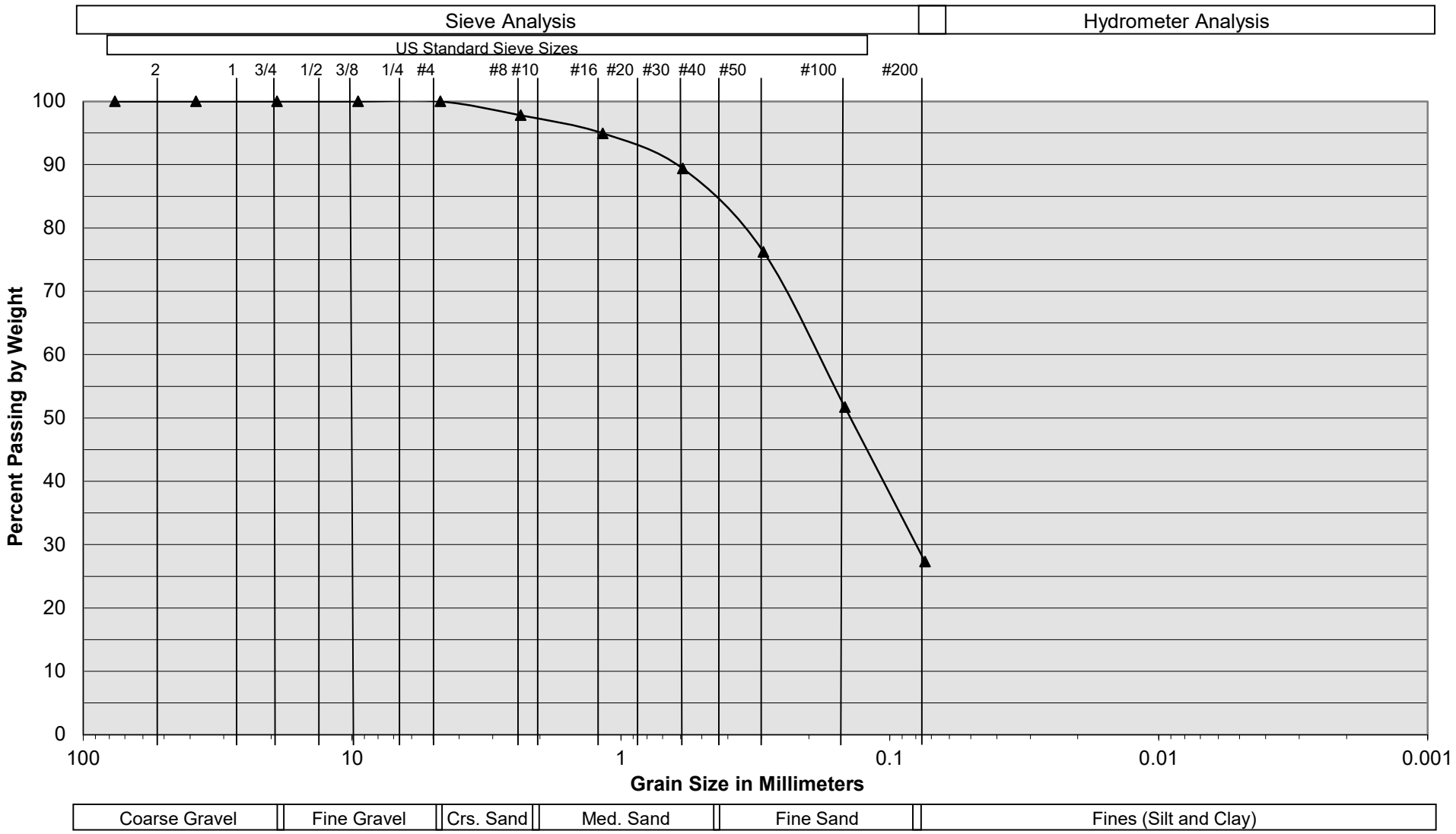


Sample Description	I-5 @ 10.5 feet
Soil Classification	Brown Silty fine to coarse Sand

Proposed Warehouse Development
Rancho Cucamonga, CA
Project No. 21G209
PLATE C- 5

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution

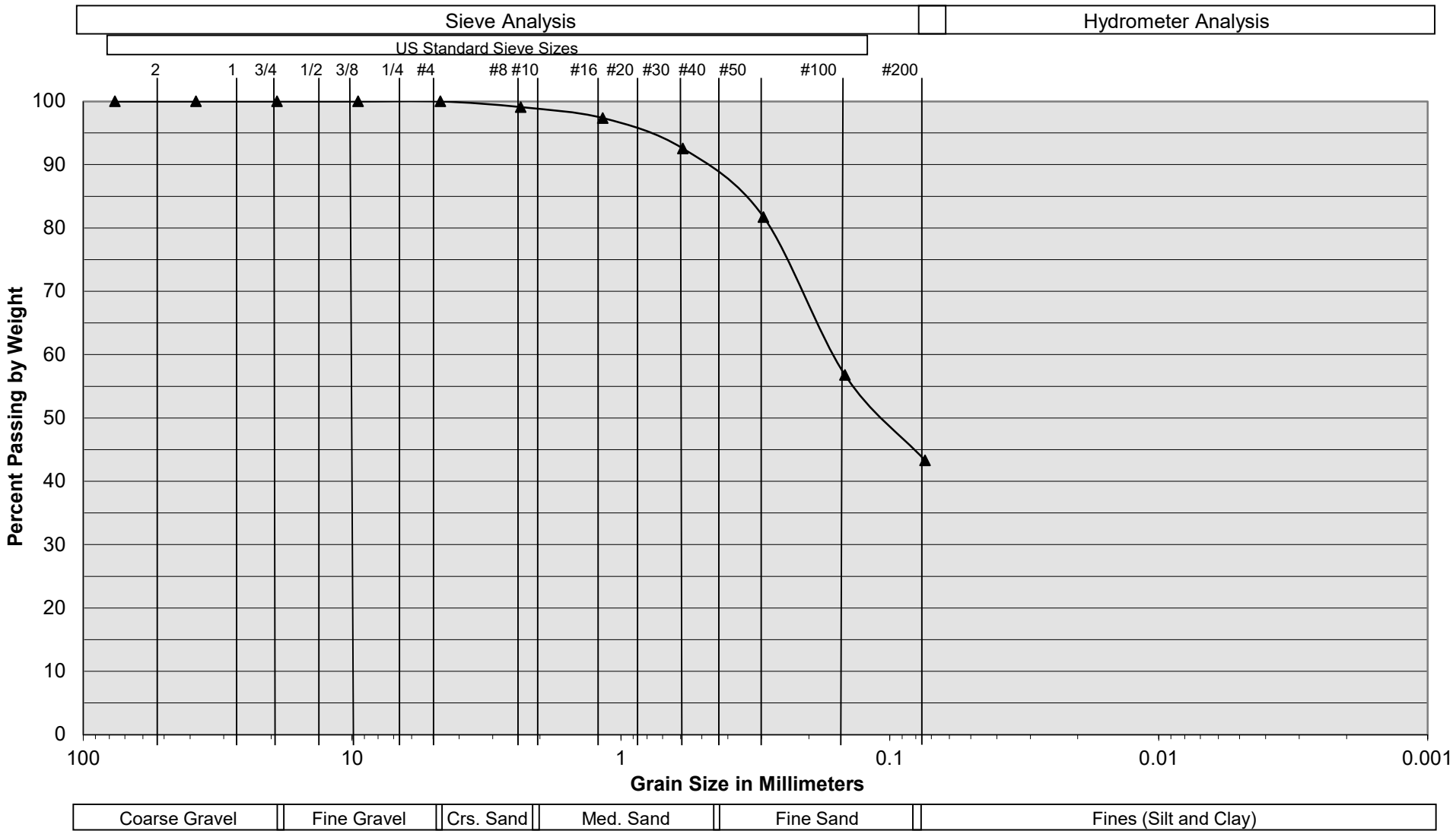


Sample Description	I-6 @ 10.5 feet
Soil Classification	Brown Silty fine to medium Sand, trace coarse Sand

Proposed Warehouse Development
Rancho Cucamonga, CA
Project No. 21G209
PLATE C- 6

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Grain Size Distribution

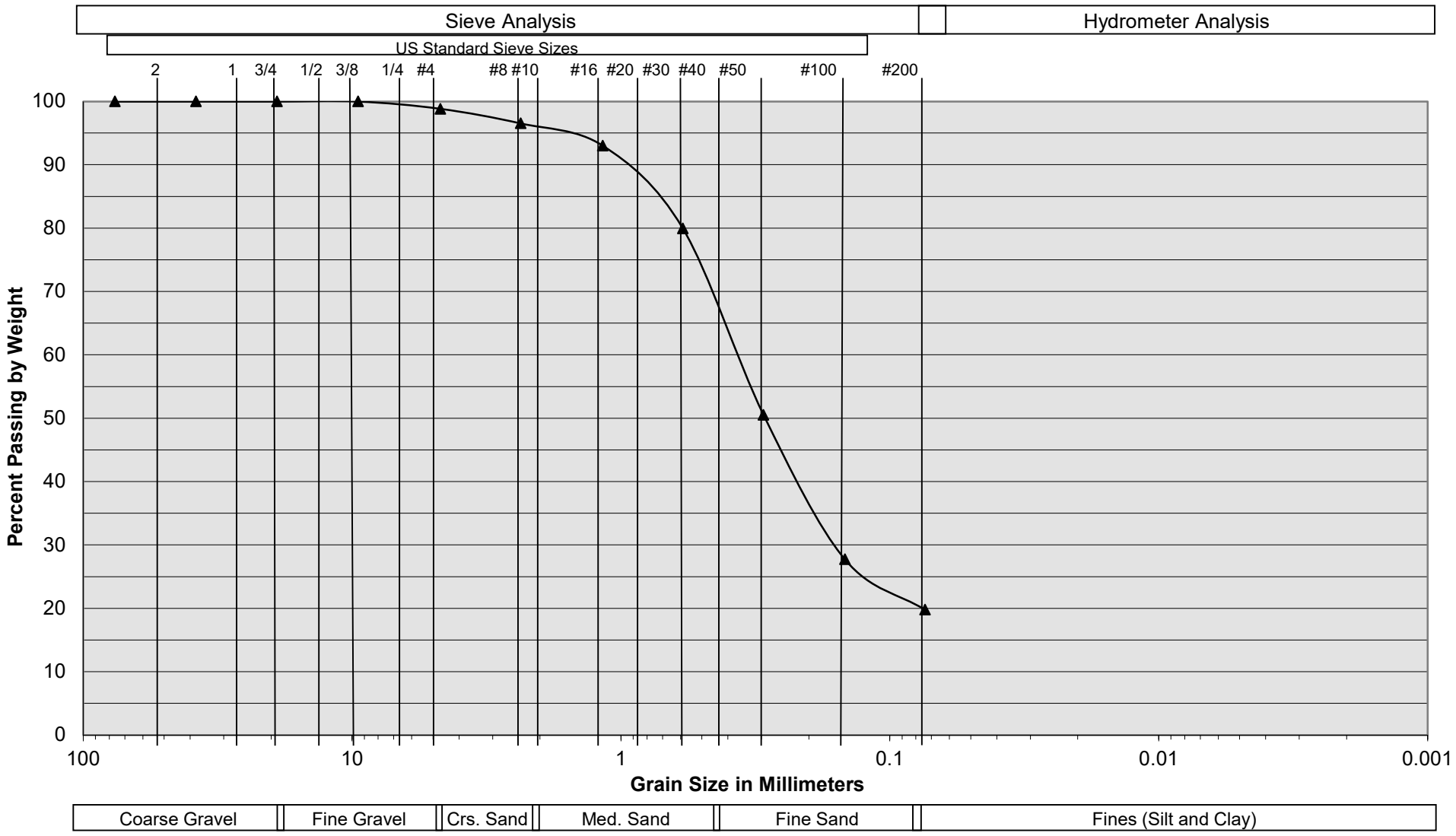


Sample Description	I-7 @ 10.5 feet
Soil Classification	Light Brown Silty fine to medium Sand

Proposed Warehouse Development
Rancho Cucamonga, CA
Project No. 21G209
PLATE C- 7

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
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Grain Size Distribution

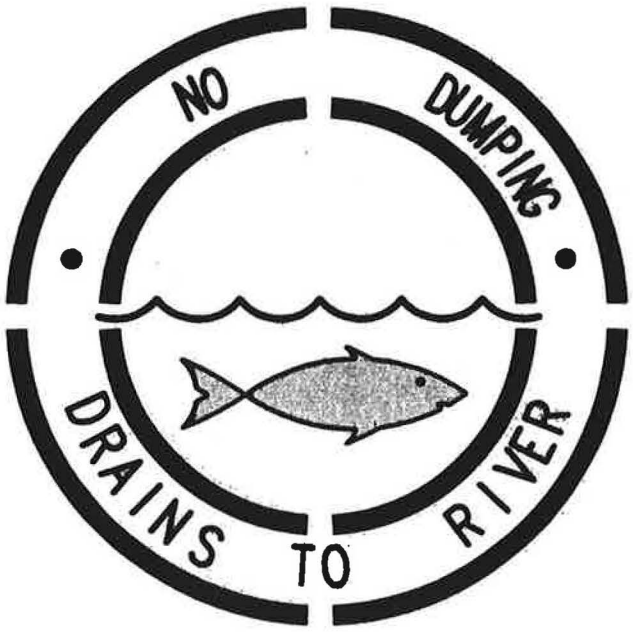


Sample Description	I-8 @ 10.5 feet
Soil Classification	Brown Silty fine to medium Sand, trace coarse Sand

Proposed Warehouse Development
Rancho Cucamonga, CA
Project No. 21G209
PLATE C- 8

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Attachment G
BMP Maintenance Material



SAMPLE STENCIL TO BE USED NEAR
GRATE AND CURB OPENING INLETS
SYMBOL TO BE 24" IN DIAMETER

Thienes Engineering
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

SAMPLE CATCH BASIN STENCIL
PER BMP SD-13

Drain Inlet Insert MP-52

General Description

Drain inlet inserts, also known as catch basin, drop inlet or curb inlet inserts, are used to remove pollutants at the point of entry to the storm drain system. There are a multitude of inserts of various shapes and configurations including baffles, baskets, boxes, fabrics, sorbent media, screens, and skimmers. The effectiveness of drain inlet inserts depends on their design, application, loading, and frequency of maintenance to remove accumulated sediment, trash, and debris.

Inspection / Maintenance Considerations

Routine inspection and maintenance is necessary to maintain functionality of drain inlet inserts and to prevent re-suspension and discharge of accumulated pollutants. Maintenance activities vary depending on the type of drain inlet insert being implemented; refer to the manufacturer's recommendations for more information.

Advanced BMPs Covered



Maintenance Concerns

- *Sediment, Trash, and Debris Accumulations*
- *Pollutant Re-suspension and Discharge*

Targeted Constituents*

Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

**Removal Effectiveness varies for different manufacturer designs. See New Development and Redevelopment Handbook-Section 5 for more information.*

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

Inspection Activities	Suggested Frequency
☐ Verify that stormwater enters the unit and does not leak around the perimeter.	After construction.
☐ Inspect for sediment, trash, and debris buildup and proper functioning.	At the beginning of the wet season and after significant storms
Maintenance Activities	**Suggested Frequency**
☐ Remove accumulated sediment, trash, and debris. ☐ Replace sorbent media.	At the beginning of the wet season and as necessary

References

California Department of Transportation. *Treatment BMP Technology Report (CTSW-RT-09-239.06),* April, 2010. http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-09-239-06.pdf.

California Stormwater Quality Association. *Stormwater Best Management Practice Handbook, New Development and Redevelopment,* 2003. https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook.

Orange County Stormwater Program. Technical Guidance Document BMP Fact Sheets. http://media.ocgov.com/gov/pw/watersheds/documents/wqmp/tgd/technical_guidance_document_bmp_fact_sheets.asp.

San Francisco Public Utilities Commission, et al. San Francisco Stormwater Design Guidelines. Appendix A, Stormwater BMP Fact Sheets, June, 2010. http://www.sfwater.org/modules/showdocument.aspx?documentid=2778.

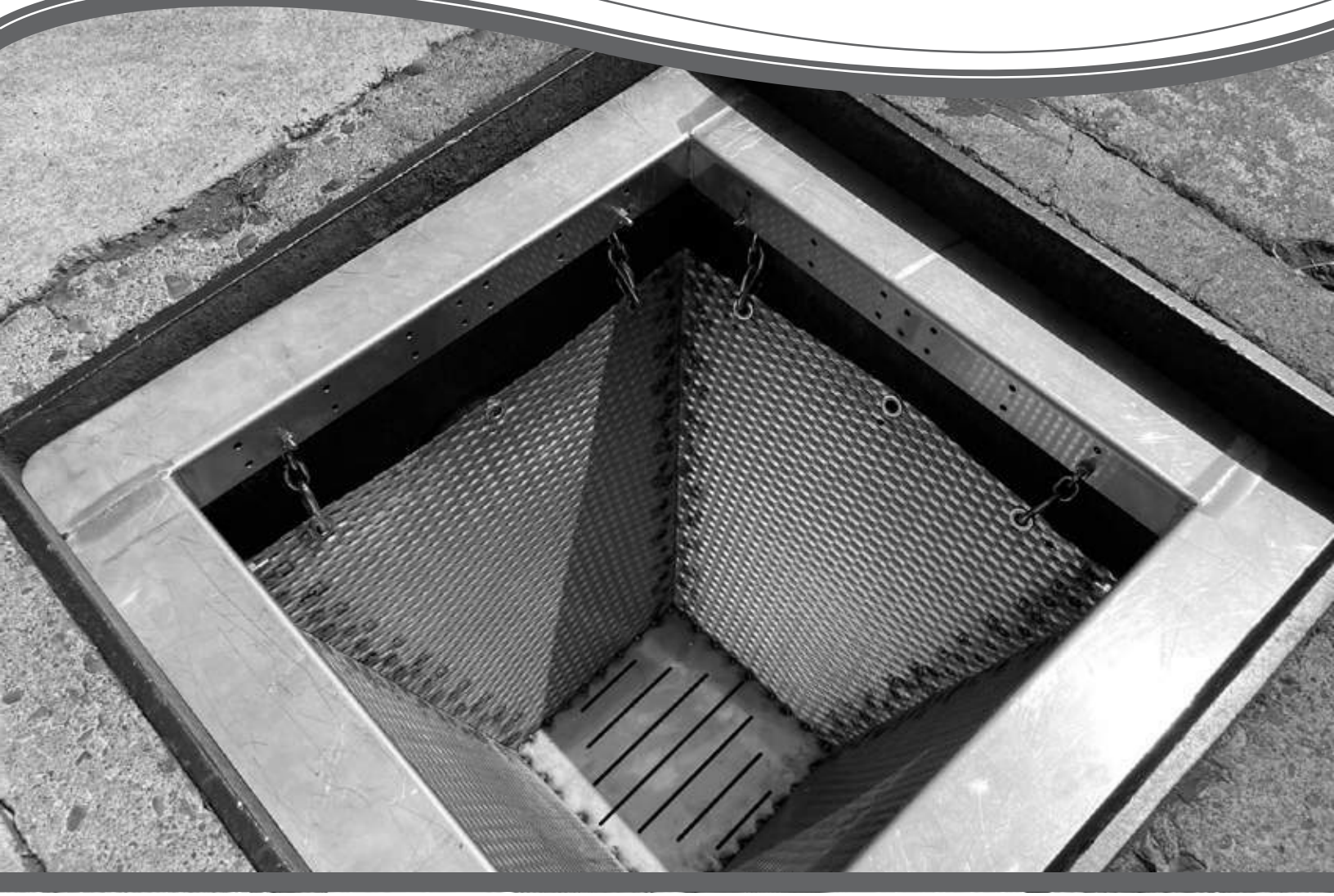
Tahoe Regional Planning Agency. Best Management Practices Handbook, 2012. http://www.tahoebmp.org/Documents/2012%20BMP%20Handbook.pdf.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development and Redevelopment. BMP Fact Sheets. Available at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5.

Ventura Countywide Stormwater Quality Management Program. *Technical Guidance Manual for Stormwater Quality Control Measures,* May, 2010. http://www.vcstormwater.org/documents/workproducts/technicalguidancemanual/2010revisions/Ventura%20Technical%20Guidance%20Document_5-6-10.pdf.

CONTECH®
ENGINEERED SOLUTIONS

Bio Clean® Grate Inlet Filter
Operation & Maintenance Manual

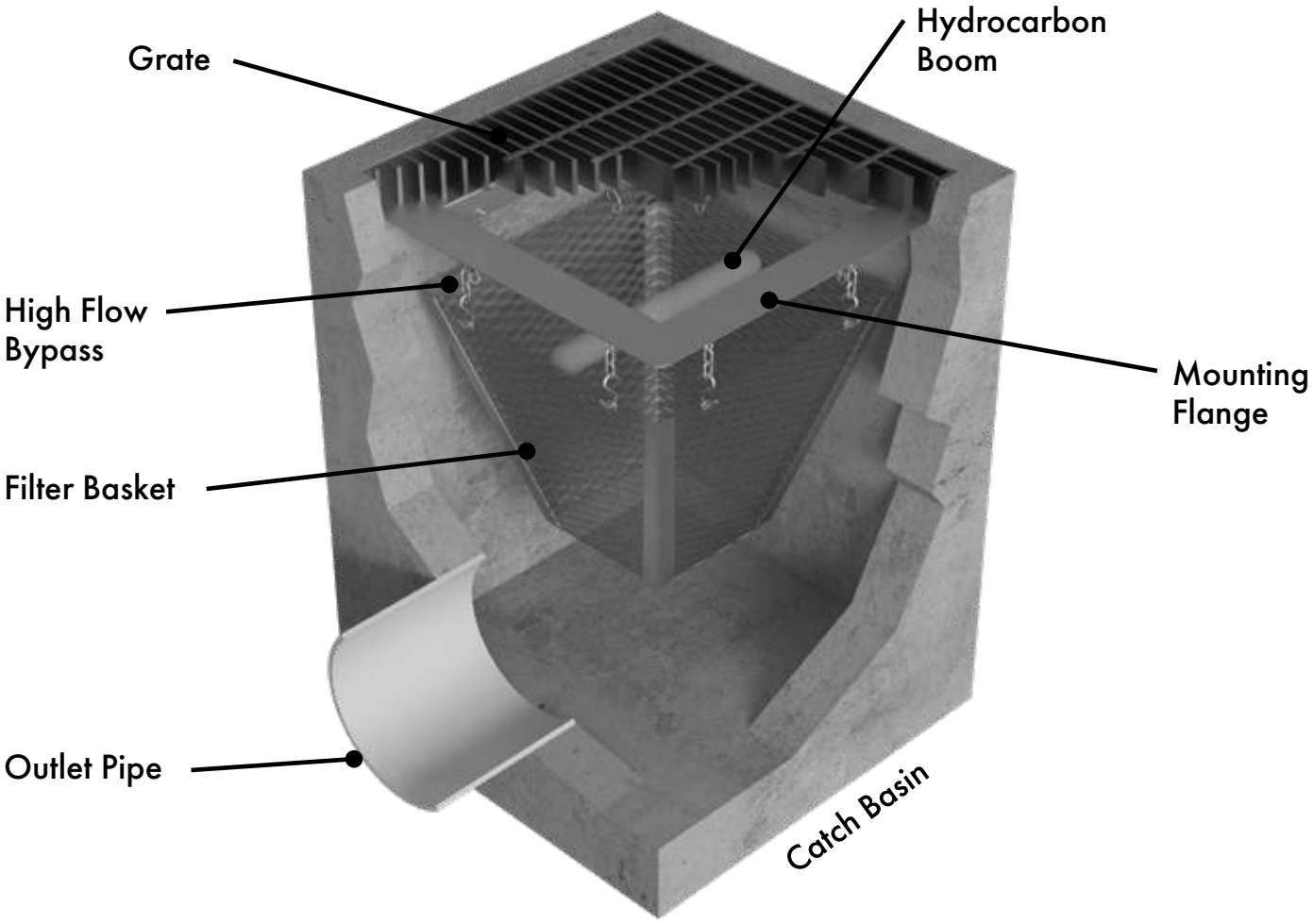


Bio Clean®

Operation & Maintenance

Contech's Bio Clean® Grate Inlet Filter is a stormwater device designed to remove high levels of trash, debris, sediments and hydrocarbons. The filter is available in several configurations including trash full capture, Kraken® membrane filter, and fabric filter variations. This manual covers maintenance procedures of the trash full capture and fabric filter configurations. A supplemental manual is available for the Kraken variation. The trash full capture filter is made of 100% stainless steel, while the fabric filter is made of a woven monofilament geotextile fabric. Both filters are available at various sizes and depths allowing them to fit in any grated catch basin inlet. The filters heavy duty construction allows for cleaning with any vacuum truck. The filter can also easily be cleaned by hand.

As with all stormwater BMPs, inspection and maintenance on the Grate Inlet Filter is necessary. Stormwater regulations require BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess site-specific loading conditions. This is recommended because pollutant loading can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding of roads, amount of daily traffic and land use can increase pollutant loading on the system. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years. Without appropriate maintenance, a BMP can exceed its storage capacity which can negatively affect its continued performance in removing and retaining captured pollutants.



System Diagram

Inspection Equipment

Following is a list of equipment to allow for simple and effective inspection of the Grate Inlet Filter:

- Contech Inspection Form (contained within this manual).
- Manhole hook or appropriate tools to remove access hatches and covers.
- Appropriate traffic control signage and procedures.
- Protective clothing and eye protection.
- Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections or maintenance of the system.



Inspection Steps

The core to any successful stormwater BMP maintenance program is routine inspections. The inspection steps required on the Grate Inlet Filter are quick and easy. As mentioned above, the first year should be seen as the maintenance interval establishment phase. During the first year, more frequent inspections should occur in order to gather loading data and maintenance requirements for that specific site. This information can be used to establish a base for long-term inspection and maintenance interval requirements.

The Grate Inlet Filter can be inspected though visual observation. All necessary pre-inspection steps must be carried out before inspection occurs, such as safety measures to protect the inspector and nearby pedestrians from any dangers associated with an open grated inlet. Once the grate has been safely removed, the inspection process can proceed:

- Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other info (see inspection form).
- Observe the filter with the grate removed.
- Look for any out of the ordinary obstructions on the grate or in the filter and its bypass. Write down any observations on the inspection form.
- Through observation and/or digital photographs estimate the amount of trash, foliage and sediment accumulated inside the filter basket. Record this information on the inspection form.
- Observe the condition and color of the hydrocarbon boom. Record this information on the inspection form.
- Finalize inspection report for analysis by the maintenance manager to determine if maintenance is required.

Maintenance Indicators

Based upon observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components.
- Obstructions in the filter basket and its bypass.
- Excessive accumulation of trash, foliage and sediment in the filter basket. Maintenance is required when the basket is greater than half-full.
- The following chart shows the 50% and 100% storage capacity of each filter height:

Basket Model	Height[1] (inches)	Top Width (inches)	Top Length (inches)	Bottom Width (inches)	Bottom Length (inches)	50% Storage Capacity (CF)	100% Storage Capacity (CF)
BIO-GRATE-FULL/ FABRIC-12-12-12	6.00	10.00	10.00	8.31	8.31	0.15	0.30
BIO-GRATE-FULL/ FABRIC-18-18-12	6.00	15.00	15.00	12.50	12.50	0.33	0.66
BIO-GRATE-FULL/ FABRIC-24-24-12	6.00	20.00	20.00	16.69	16.69	0.59	1.18
BIO-GRATE-FULL/ FABRIC-24-24-24	18.00	20.00	20.00	10.00	10.00	1.22	2.44
BIO-GRATE-FULL/ FABRIC-24-40-12	6.00	20.00	30.00	16.69	25.00	0.88	1.76
BIO-GRATE-FULL/ FABRIC-24-40-24	18.00	20.00	30.00	10.00	15.00	1.82	3.64
BIO-GRATE-FULL/ FABRIC-36-36-24	18.00	30.00	30.00	15.00	15.00	2.73	5.46
BIO-GRATE-FULL/ FABRIC-24-40-24	18.00	20.00	30.00	10.00	15.00	1.82	3.64
BIO-GRATE-FULL/ FABRIC-36-36-24	18.00	30.00	30.00	15.00	15.00	2.73	5.46

[1] Refers to basket height, total system height is equal to basket height plus 6 inches for bypass.

Maintenance Equipment

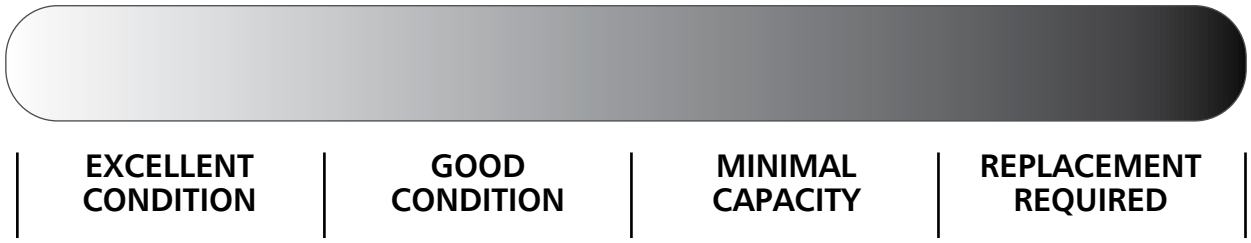
It is recommended that a vacuum truck be utilized to minimize the time required to maintain the Curb Inlet Filter, though it can easily be cleaned by hand:

- Contech Maintenance Form (contained in O&M Manual).
- Manhole hook or appropriate tools to remove the grate.
- Appropriate safety signage and procedures.
- Protective clothing and eye protection.
- Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine maintenance of the system. Small or large vacuum truck (with pressure washer attachment preferred).

Maintenance Procedures

It is recommended that maintenance occurs at least two days after the most recent rain event to allow debris and sediments to dry out. Maintaining the system while flows are still entering it will increase the time and complexity required for maintenance. Cleaning of the Grate Inlet Filter can be performed utilizing a vacuum truck. Once all safety measures have been set up, cleaning of the Grate Inlet Filter can proceed as followed:

- Remove grate (traffic control and safety measures to be completed prior)
- Using an extension on a vacuum truck, position the hose over the opened catch basin. Insert the vacuum hose down into the filter basket and suck out trash, foliage and sediment. A pressure wash is recommended and will assist in spraying off any debris stuck on the side or bottom of the filter basket. Power wash off the filter basket sides and bottom.
- Next, remove the hydrocarbon boom that is attached to the inside of the filter basket. The hydrocarbon boom is fastened to rails on two opposite sides of the basket (vertical rails). Assess the color and condition of the boom using the following information in the next bullet point. If replacement is required, install and fasten on a new hydrocarbon boom. Booms can be ordered directly from the manufacturer.
- The following is a replacement indication color chart for the hydrocarbon booms:

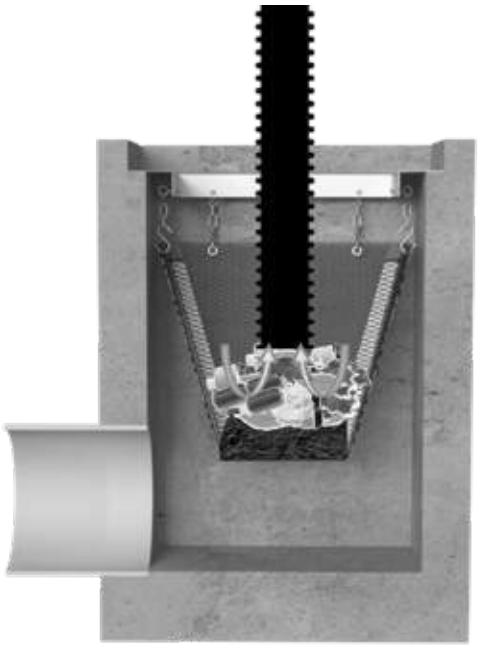


- The last step is to replace the grate and remove all traffic control.
- All removed debris and pollutants shall be disposed of following local and state requirements.
- Disposal requirements for recovered pollutants may vary depending on local guidelines. In most areas the sediment, once dewatered, can be disposed of in a sanitary landfill. It is not anticipated that the sediment would be classified as hazardous waste.
- In the case of damaged components, replacement parts can be ordered from the manufacturer. Hydrocarbon booms can also be ordered directly from the manufacturer as previously noted.

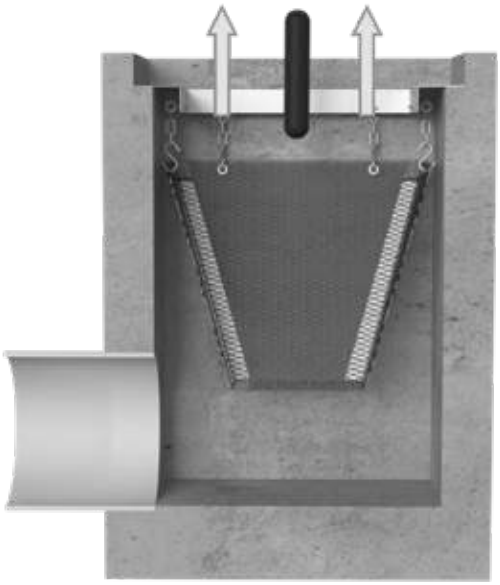
Maintenance Sequence



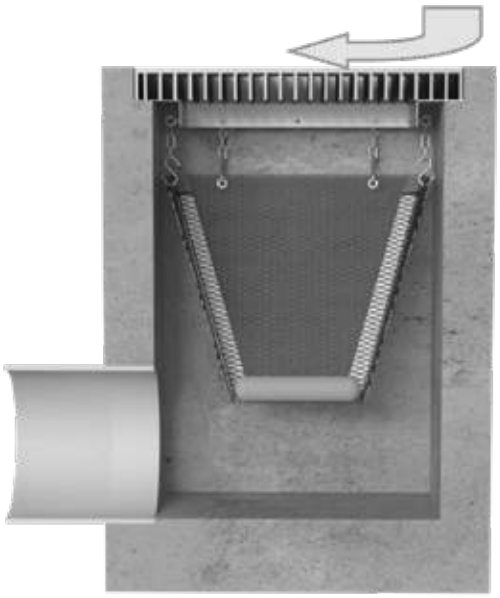
1. Remove grate and set up vacuum truck to clean the filter basket.



2. Insert the vacuum hose down into the filter basket and suck out debris. Use a pressure washer to assist in vacuum removal. Pressure wash off screens.



3. Remove the hydrocarbon boom that is attached to the inside of the filter basket. The hydrocarbon boom is fastened to rails on two opposite sides of the basket (vertical rails). Assess the color and condition of the boom using the information in the chart above. If replacement is required, install and fasten on a new hydrocarbon boom.



4. Close up and replace the grate and remove all traffic control. All removed debris and pollutants shall be disposed of following local and state requirements.

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Inspection and Maintenance Report
Catch Basin Only

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspector Name _____ Date ____ / ____ / _____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Insert	Catch Basin Size	Evidence of Illicit Discharge?	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Signs of Structural Damage?	Functioning Properly or Maintenance Needed?
1	Lat: Long:							
2	Lat: Long:							
3	Lat: Long:							
4	Lat: Long:							
5	Lat: Long:							
6	Lat: Long:							
7	Lat: Long:							
8	Lat: Long:							
10	Lat: Long:							
11	Lat: Long:							
12	Lat: Long:							
Comments:								



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Grate Inlet Filter Operation & Maintenance Manual 08/22

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Bio Clean® Curb Inlet Filter
Operation & Maintenance Manual

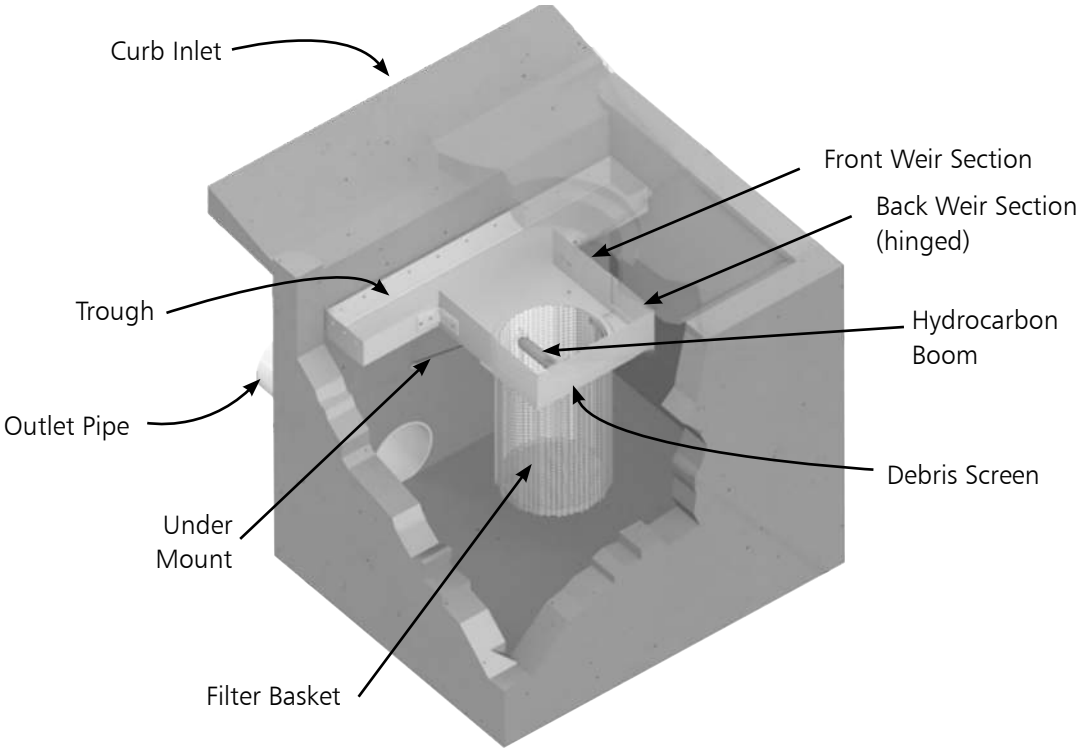


Bio Clean®

Operation & Maintenance

Contech's Bio Clean® Curb Inlet Filter is a stormwater device designed to remove high levels of trash, debris, sediments and hydrocarbons. The filter is available in several configurations including trash full capture,filter fabric, and Kraken membrane filter variations. This manual covers maintenance procedures of the trash full capture and filter fabric configurations. A supplemental manual is available for the Kraken variations. The innovative trough & weir system is mounted along the curb face and directs incoming stormwater toward the filter basket which is positioned "directly" under the manhole access opening regardless of its location in the catch basin. This innovative design allows the filter to be cleaned from finish surface without access into the catch basin, therefore drastically reducing maintenance time and eliminating confined space entry. The filter has a lifting handle allowing for the filter to be removed easily through the manhole. The weir also folds up to allow for unimpeded access into the basin for routine maintenance or pipe jetting.

As with all stormwater BMPs, inspection and maintenance on the Curb Inlet Filter is necessary. Stormwater regulations require BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess site-specific loading conditions. This is recommended because pollutant loading can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding of roads, amount of daily traffic and land use can increase pollutant loading on the system. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years. Without appropriate maintenance a BMP can exceed its storage capacity which can negatively affect its continued performance in removing and retaining captured pollutants.



Inspection Equipment

Following is a list of equipment to allow for simple and effective inspection of the Curb Inlet Filter:

- Contech Inspection Form (contained within this manual).
- Manhole hook or appropriate tools to remove access hatches and covers.
- Appropriate traffic control signage and procedures.
- Protective clothing and eye protection.
- Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections or maintenance of the system.



Inspection Steps

The core to any successful stormwater BMP maintenance program is routine inspections. The inspection steps required on the Curb Inlet Filter are quick and easy. As mentioned above the first year should be seen as the maintenance interval establishment phase. During the first year more frequent inspections should occur in order to gather loading data and maintenance requirements for that specific site. This information can be used to establish a base for long-term inspection and maintenance interval requirements.

The Curb Inlet Filter can be inspected though visual observation without entry into the catch basin. All necessary pre-inspection steps must be carried out before inspection occurs, such as safety measures to protect the inspector and nearby pedestrians from any dangers associated with an open access hatch or manhole. Once the manhole has been safely opened the inspection process can proceed:

- Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other info (see inspection form).
- Observe the inside of the catch basin through the manhole. If minimal light is available and vision into the unit is impaired utilize a flashlight to see inside the catch basin.
- Look for any out of the ordinary obstructions in the catch basin, trough, weir, filter basket, basin floor our outlet pipe. Write down any observations on the inspection form.
- Through observation and/or digital photographs estimate the amount of trash, foliage and sediment accumulated inside the filter basket. Record this information on the inspection form.
- Observe the condition and color of the hydrocarbon boom. Record this information on the inspection form.
- Finalize inspection report for analysis by the maintenance manager to determine if maintenance is required.

Maintenance Indicators

Based upon observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components.
- Obstructions in the filter basket and its bypass.
- Excessive accumulation of trash, foliage and sediment in the filter basket. Maintenance is required when the basket is greater than half-full.
- The following chart shows the 50% and 100% storage capacity of each filter height:

Basket Model	Filter Basket Diameter (inches)	Filter Basket Height (inches)	50% Storage Capacity (CF)	100% Storage Capacity (CF)
BC-CURB-24	16	24	1.77	3.53
BC-CURB-12	16	12	0.88	1.77

Maintenance Equipment

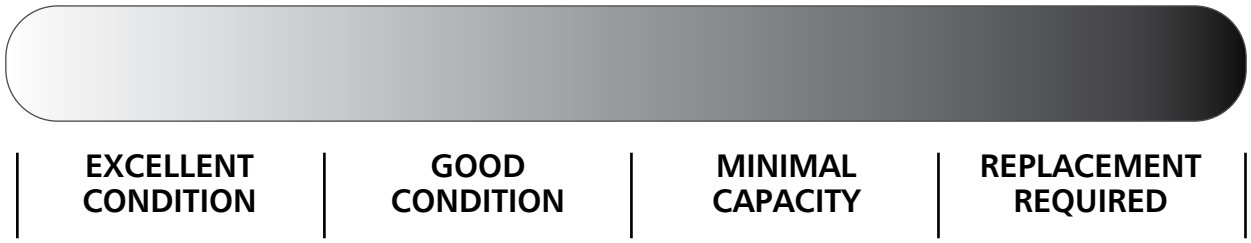
It is recommended that a vacuum truck be utilized to minimize the time required to maintain the Curb Inlet Filter though it can easily cleaned by hand:

- Contech Maintenance Form (contained in O&M Manual).
- Manhole hook or appropriate tools to access hatches and covers.
- Appropriate safety signage and procedures.
- Protective clothing and eye protection.
- Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine maintenance of the system. Small or large vacuum truck (with pressure washer attachment preferred).

Maintenance Procedures

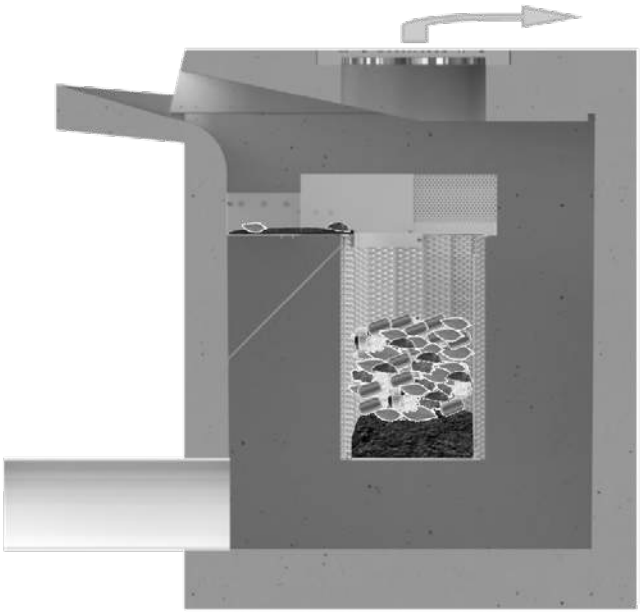
It is recommended that maintenance occurs at least two days after the most recent rain event to allow debris and sediments to dry out. Maintaining the system while flows are still entering it will increase the time and complexity required for maintenance. Cleaning of the Curb Inlet Filter can be performed from finish surface without entry into catch basin utilizing a vacuum truck. Some unique and custom configurations may create conditions which would require entry for some or all of the maintenance procedures. Once all safety measures have been set up cleaning of the Curb Inlet Filter can proceed as followed:

- Remove all manhole cover or access hatches (traffic control and safety measures to be completed prior).
- Using an extension on a vacuum truck position the hose over the opened manhole or hatch opening. Insert the vacuum hose down into the filter basket and suck out trash, foliage and sediment. A pressure wash is recommended and will assist in spraying of any debris stuck on the side or bottom of the filter basket. If the filter basket is full, trash, sediment, and debris will accumulate inside the trough and weir sections of the system. Once the filter basket is clean power wash the weir and trough pushing these debris into the filter basket (leave the hose in the filter basket during this process so entering debris will be sucked out). Power wash off the trough, weir, debris screen, and filter basket sides and bottom.
- Next remove the hydrocarbon boom that is attached to the inside of the filter basket. The hydrocarbon boom is fastened to rails on two opposite sides of the basket (vertical rails). Assess the color and condition of the boom using the following information in the next bullet point. If replacement is required install and fasten on a new hydrocarbon boom. Booms can be ordered directly from the manufacturer.
- Follow is a replacement indication color chart for the hydrocarbon booms:

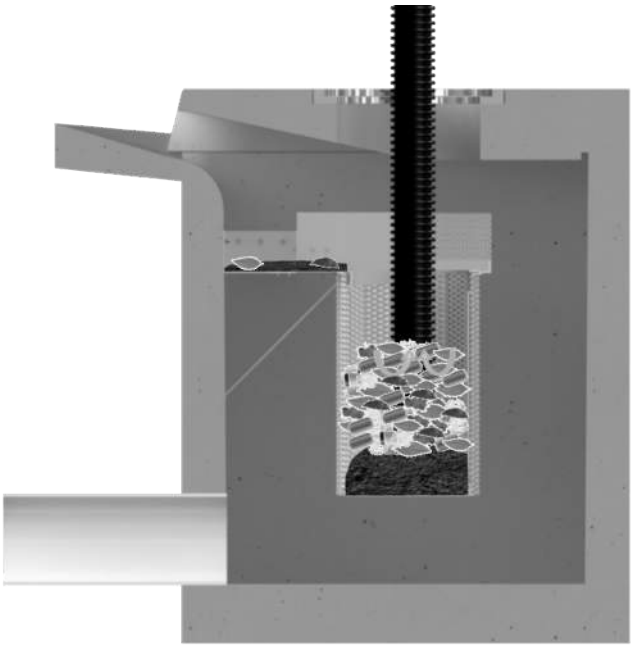


- The last step is to close up and replace the manhole or hatch and remove all traffic control.
- All removed debris and pollutants shall be disposed of following local and state requirements.
- Disposal requirements for recovered pollutants may vary depending on local guidelines. In most areas the sediment, once dewatered, can be disposed of in a sanitary landfill. It is not anticipated that the sediment would be classified as hazardous waste.
- In the case of damaged components, replacement parts can be ordered from the manufacturer. Hydrocarbon booms can also be ordered directly from the manufacturer as previously noted.

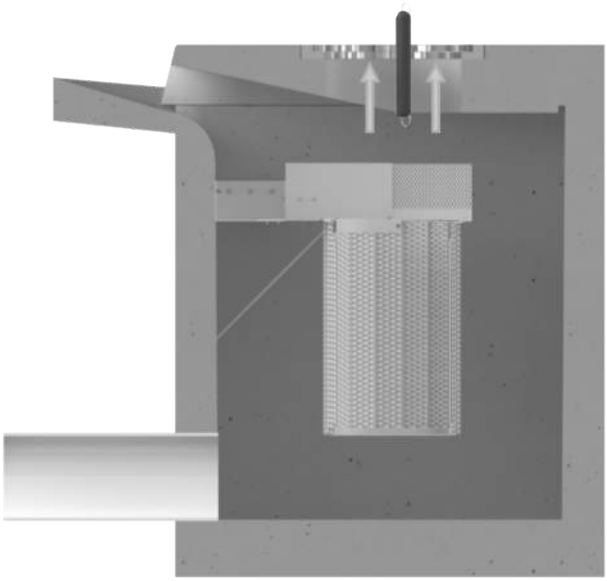
Maintenance Sequence



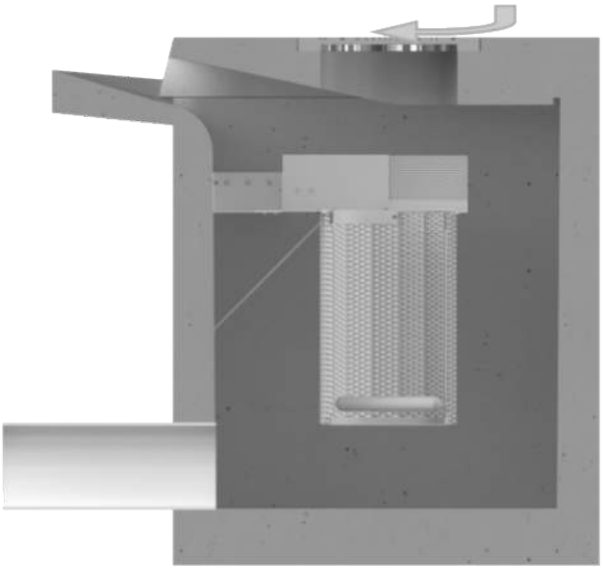
1. *Remove manhole cover and set up vacuum truck to clean the filter basket. Ensure all traffic control and safety measures are in place.*



2. *Insert the vacuum hose down into the filter basket and suck out debris. Use a pressure washer to assist in vacuum removal. Pressure wash off the weir and trough and vacuum out any remaining debris.*



3. *Remove the hydrocarbon boom that is attached to the inside of the filter basket. The hydrocarbon boom is fastened to rails on two opposite sides of the basket (vertical rails). Assess the color and condition of the boom using the following information in the next bullet point. If replacement is required install and fasten on a new hydrocarbon boom.*



4. *Close up and replace the manhole or hatch and remove all traffic control. All removed debris and pollutants shall be disposed of following local and state requirements.*

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Inspection and Maintenance Report
Catch Basin Only

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspector Name _____ Date ____ / ____ / _____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Insert	Catch Basin Size	Evidence of Illicit Discharge?	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Signs of Structural Damage?	Functioning Properly or Maintenance Needed?
1	Lat: Long:							
2	Lat: Long:							
3	Lat: Long:							
4	Lat: Long:							
5	Lat: Long:							
6	Lat: Long:							
7	Lat: Long:							
8	Lat: Long:							
10	Lat: Long:							
11	Lat: Long:							
12	Lat: Long:							
Comments:								



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Curb Inlet Filter Operation & Maintenance Manual 10/22

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Contech® CMP Detention & Infiltration Maintenance Guide



CONTECH®
CMP DETENTION SYSTEMS

Maintenance

Underground storm water detention and retention systems should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size or configuration of the system.

Inspection

Inspection is the key to effective maintenance and is easily performed. CONTECH recommends ongoing quarterly inspections of the accumulated sediment. Sediment deposition and transport may vary from year to year and quarterly inspections will help insure that systems are cleaned out at the appropriate time. Inspections should be performed more often in the winter months in climates where sanding operations may lead to rapid accumulations, or in equipment washdown areas. It is very useful to keep a record of each inspection. A sample inspection log is included for your use.

Systems should be cleaned when inspection reveals that accumulated sediment or trash is clogging the discharge orifice. CONTECH suggests that all systems be designed with an access/inspection manhole situated at or near the inlet and the outlet orifice. Should it be necessary to get inside the system to perform maintenance activities, all appropriate precautions regarding confined space entry and OSHA regulations should be followed.

Cleaning

Maintaining an underground detention or retention system is easiest when there is no flow entering the system. For this reason, it is a good idea to schedule the cleanout during dry weather.

Accumulated sediment and trash can typically be evacuated through the manhole over the outlet orifice. If maintenance is not performed as recommended, sediment and trash may accumulate in front of the outlet orifice. Manhole covers should be securely seated following cleaning activities.

Inspection & Maintenance Log Sample Template

_____" Diameter System			Location: Anywhere, USA		
Date	**Depth of Sediment**	**Accumulated Trash**	**Maintenance Performed**	**Maintenance Personnel**	**Comments**
12/01/10	2"	None	Removed Sediment	B. Johnson	Installed
03/01/11	1"	Some	Removed Sediment and Trash	B. Johnson	Swept parking lot
06/01/11	0"	None	None		
09/01/11	0"	Heavy	Removed Trash	S. Riley	
12/01/11	1"	None	Removed Sediment	S. Riley	
04/01/12	0"	None	None	S. Riley	
04/15/01	2	Some	Removed Sediment and Trash	ACE Environmental Services	

SAMPLE

CONTECH®
CMP DETENTION SYSTEMS

Support

Drawings and specifications are available at www.ContechES.com.

Site-specific support is available from our engineers.

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www.ContechES.com

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CONTECH®
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Modular Wetlands® Linear
Operation & Maintenance Manual



MODULAR WETLANDS®

MODULAR WETLANDS® LINEAR OPERATION & MAINTENANCE MANUAL

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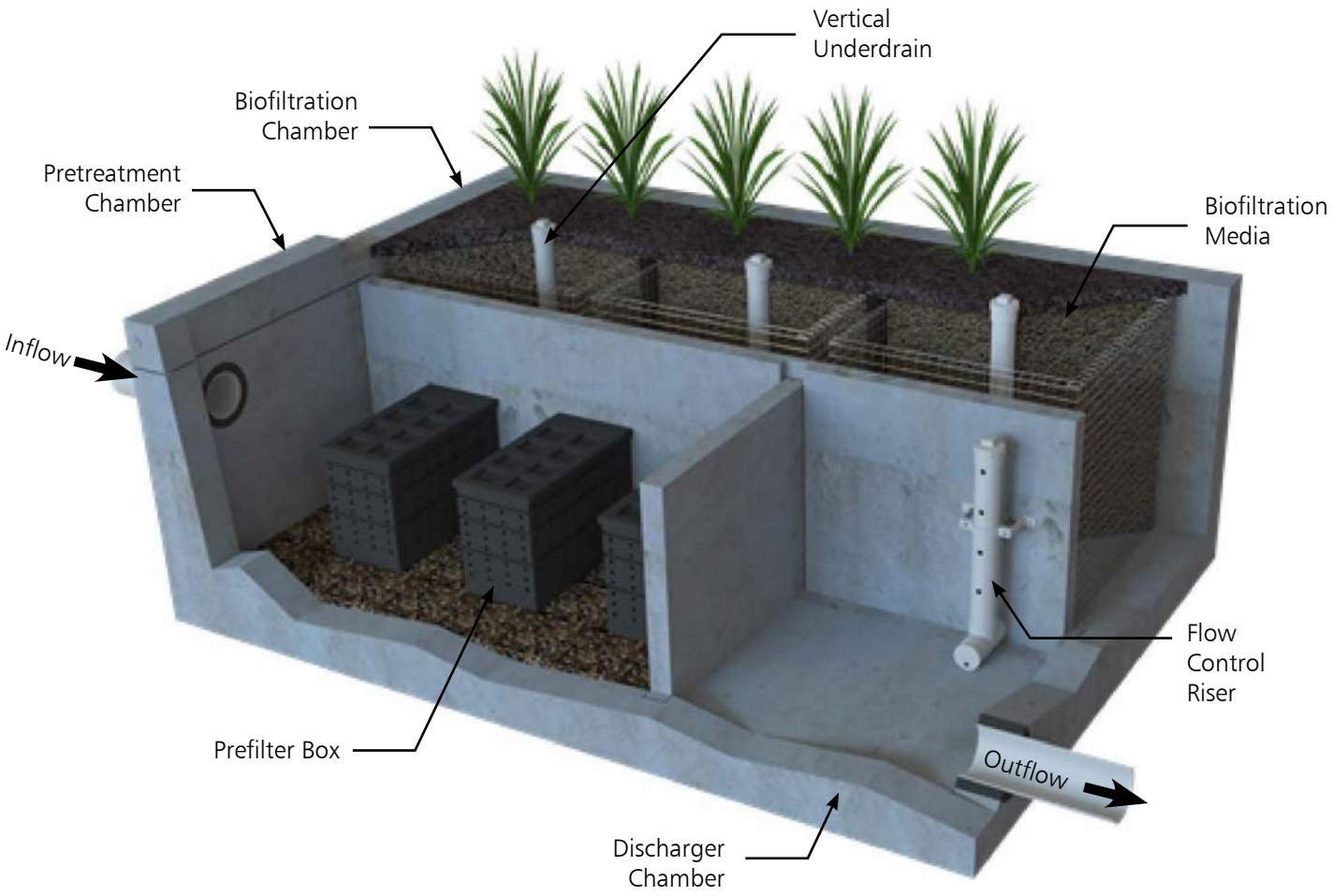
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OVERVIEW

The Modular Wetlands® Linear Biofilter is designed to remove high levels of trash, debris, sediments, nutrients, metals, and hydrocarbons. Its simple design allows for quick and easy installation. The system is housed in a standard precast structure and can be installed at various depths to meet site-specific conditions.

INTRODUCTION

This is the Modular Wetlands Linear Biofilter operation and maintenance manual. Before starting, read the instructions and equipment lists closely. It is important to follow all necessary safety procedures associated with state and local regulations. Some steps required confined space entry. Please contact Contech for more information on pre-authorized third party contractors who can provide installation services in your area. For a list of service providers in your area please visit: www.conteches.com/maintenance.



INSTRUCTIONS

INSPECTION SUMMARY

Stormwater regulations require BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess the site specific loading conditions. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided.

- Inspect pre-treatment, biofiltration, and discharge chambers an average of once every six to twelve months. Varies based on site specific and local conditions.
- Average inspection time is approximately 15 minutes. Always ensure appropriate safety protocol and procedures are followed.

The following is a list of equipment required to allow for simple and effective inspection of the Modular Wetlands Linear:

- Modular Wetlands Linear Inspection Form
- Flashlight
- Manhole hook or appropriate tools to remove access hatches and covers
- Appropriate traffic control signage and procedures
- Measuring pole and/or tape measure
- Protective clothing and eye protection
- 7/16" open or closed ended wrench
- Large permanent black marker (initial inspections only - first year)

Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections of the system

INSPECTION AND MAINTENANCE NOTES

1. Following maintenance and/or inspection, it is recommended that the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.
2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.
3. Transport all debris, trash, organics, and sediments to approved facility for disposal in accordance with local and state requirements.
4. Entry into chambers may require confined space training based on state and local regulations.
5. No fertilizer shall be used in the biofiltration chamber.
6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may not require irrigation after initial establishment.

INSPECTION PROCESS

1. Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other information (see inspection form).
2. Observe the inside of the system through the access covers. If minimal light is available and vision into the unit is impaired, utilize a flashlight to see inside the system and all of its chambers.
3. Look for any out of the ordinary obstructions in the inflow pipe, pre-treatment chamber, biofiltration chamber, discharge chamber or outflow pipe. Write down any observations on the inspection form.
4. Through observation and/or digital photographs, estimate the amount of trash, debris accumulated in the pre-treatment chamber. Utilizing a tape measure or measuring stick, estimate the amount of sediment in this chamber. Record this depth on the inspection form.
5. Through visual observation, inspect the condition of the pre-filter cartridges. Look for excessive build-up of sediment on the cartridges, any build-up on the tops of the cartridges, or clogging of the holes. Record this information on the inspection form. The prefilter cartridges can be further inspected by removing the cartridge tops and assessing the color of the BioMediaGREEN filter cubes (requires entry into pre-treatment chamber - see notes previous notes regarding confined space entry). Record the color of the material. New material is a light green color. As the media becomes clogged, it will turn darker in color, eventually becoming dark brown or black. The closer to black the media is the higher percentage that the media is exhausted and is in need of replacement.



6. The biofiltration chamber is generally maintenance-free due to the system's advanced pre-treatment chamber. For units which have open planters with vegetation, it is recommended that the vegetation be inspected. Look for any plants that are dead or showing signs of disease or other negative stressors. Record the general health of the plants on the inspection form and indicate through visual observation or digital photographs if trimming of the vegetation is required.
7. The discharge chamber houses the orifice control structure, drain down filter (only in California - older models), and is connected to the outflow pipe. It is important to check to ensure the orifice is in proper operating conditions and free of any obstructions. It is also important to assess the condition of the drain down filter media which utilizes a block form of the BioMediaGREEN. Assess in the same manner as the cubes in the pre-filter cartridge as mentioned above. Generally, the discharge chamber will be clean and free of debris. Inspect the water marks on the side walls. If possible, inspect the discharge chamber during a rain event to assess the amount of flow leaving the system while it is at 100% capacity (pre-treatment chamber water level at peak HGL - top of bypass weir). The water level of the flowing water should be compared to the watermark level on the side walls, which is an indicator of the highest discharge rate the system achieved when initially installed. Record on the form if there is any difference in level from the watermark in inches.

NOTE: During the first few storms, the water level in the outflow chamber should be observed and a 6" long horizontal watermark line drawn (using a large permanent marker) at the water level in the discharge chamber while the system is operating at 100% capacity. The diagram below illustrates where the line should be drawn. This line is a reference point for future inspections of the system.

Water level in the discharge chamber is a function of flow rate and pipe size. Observation of the water level during the first few months of operation can be used as a benchmark level for future inspections. The initial mark and all future observations shall be made when the system is at 100% capacity (water level at maximum level in the pre-treatment chamber). If future water levels are below this mark when the system is at 100% capacity, this is an indicator that maintenance to the pre-filter cartridges may be needed.

8. Finalize the inspection report for analysis by the maintenance manager to determine if maintenance is required.





MAINTENANCE INDICATORS

Based upon the observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components or cartridges
- Obstructions in the system or its inlet and/or outlet pipes
- Excessive accumulation of floatables in the pretreatment chamber in which the length and width of the chamber is fully impacted more than 18". See photo below.
- Excessive accumulation of sediment in the pretreatment chamber of more than 6" in depth.
- Excessive accumulation of sediment on the BioMediaGREEN media housed within the pretreatment cartridges. The following chart shows photos of the condition of the BioMediaGREEN contained within the pre-filter cartridges. When media is more than 85% clogged, replacement is required.
- Excessive accumulation of sediment on the BioMediaGREEN media housed within the pretreatment cartridges. When media is more than 85% clogged, replacement is required. The darker the BioMediaGREEN, the more clogged it is and in need of replacement.





INSPECTION PROCESS

- Excessive accumulation of sediment on the BioMediaGREEN media housed within the drain down filter (California only - older models). The following photos show the condition of the BioMediaGREEN contained within the drain down filter. When media is more than 85% clogged, replacement is required.





- Overgrown vegetation.



- Water level in the discharge chamber during 100% operating capacity (pretreatment chamber water level at max height) is lower than the water mark by 20%.

MAINTENANCE SUMMARY

The time has come to maintain your Modular Wetlands® Linear. All necessary pre-maintenance steps must be carried out before maintenance occurs. Once traffic control has been set up per local and state regulations and access covers have been safely opened, the maintenance process can begin. It should be noted that some maintenance activities require confined space entry. All confined space requirements must be strictly followed before entry into the system. In addition, the following is recommended:

- Prepare the maintenance form by writing in the necessary information including project name, location, date & time, unit number and other info (see maintenance form).
- Set up all appropriate safety and cleaning equipment.
- Ensure traffic control is set up and properly positioned.
- Prepared pre-checks (OSHA, safety, confined space entry) are performed.

The following is a list of equipment to required for maintenance of the Modular Wetlands® Linear:

- Modular Wetlands Linear Maintenance Form
- Manhole hook or appropriate tools to access hatches and covers
- Protective clothing, flashlight, and eye protection
- 7/16" open or closed ended wrench
- Vacuum assisted truck with pressure washer
- Replacement BioMediaGREEN for pre-filter cartridges if required (order from one of Contech's Maintenance Team members at https://www.conteches.com/maintenance).

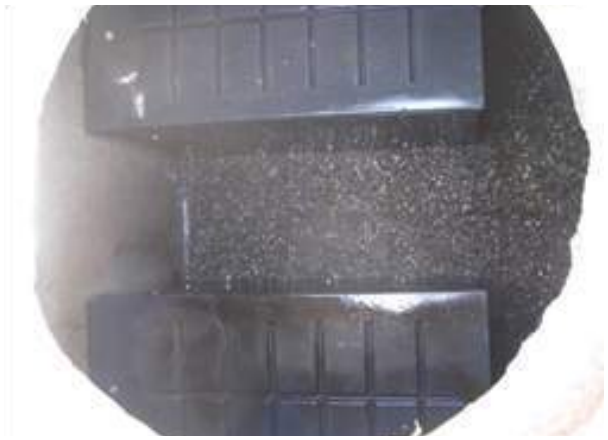
MAINTENANCE | PRETREATMENT CHAMBER

1. Remove access cover over pre-treatment chamber and position vacuum truck accordingly.
2. With a pressure washer, spray down pollutants accumulated on walls and pre-filter cartridges.
3. Vacuum out pre-treatment chamber and remove all accumulated pollutants including trash, debris, and sediments. Be sure to vacuum the floor until the pervious pavers are visible and clean.
4. If pre-filter cartridges require media replacement, continue to step 5. If not, replace access cover and move to step 11.









MAINTENANCE | PREFILTER CARTRIDGES

5. After successfully cleaning out the pre-treatment chamber (previous page) enter the pre-treatment chamber.
6. Unscrew the two bolts (circles shown below) holding the lid on each cartridge filter and remove lid.

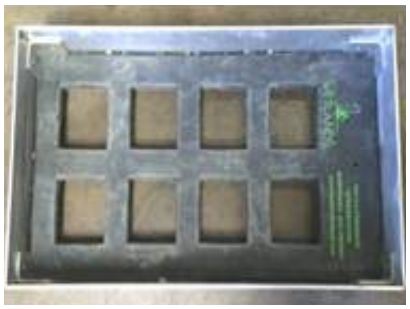




7. Place the vacuum hose over each individual media filter to suck out filter media.



8. Once filter media has been sucked out, use a pressure washer to spray down the inside of the cartridge and it's media cages. Remove cleaned media cages and place to the side. Once removed, the vacuum hose can be inserted into the cartridge to vacuum out any remaining material near the bottom of the cartridge.
9. Reinstall media cages and fill with new media from the manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase. Utilize the manufacture-provided refilling tray and place on top of the cartridge. Fill the tray with new bulk media and shake down into place. Using your hands, lightly compact the media into each filter cage. Once the cages are full, remove the refilling tray and replace the cartridge top, ensuring bolts are properly tightened.







10. Exit the pre-treatment chamber. Replace access hatch or manhole cover.

MAINTENANCE | BIOFILTRATION CHAMBER

11. In general, the biofiltration chamber is maintenance-free with the exception of maintaining the vegetation. The Modular Wetlands Linear utilizes vegetation similar to surrounding landscape areas, therefore trim vegetation to match surrounding vegetation. If any plants have died, replace them with new ones.



12. Each vertical under drain on the biofiltration chamber has a removable (threaded cap) that can be taken off to check any blockages or root growth. Once removed, a jetting attachment can be used to clean out the under drain and orifice riser.
13. As with all biofilter systems, at some point the biofiltration media (WetlandMedia) will need to be replaced. Either because of physical clogging of sorptive exhaustion of the media ion exchange capacity (to remove dissolved metals and phosphorous). The general life of this media is 10 to 20 years based on site specific conditions and pollutant loading. Utilize the vacuum truck to vacuum out the media by placing the hose into the chamber. Once all the media is removed use the power washer to spray down all the netting on the outer metal cage. Inspect the netting for any damage or holes. If the netting is damaged it can be repaired or replaced with guidance by the manufacturer.
14. Contact one of Contech's Maintenance Team members at https://www.conteches.com/maintenance to order new WetlandMedia. The quantity of media needed can be determined by providing the model number and unit depth. Media will be provided in super sacks for easy installation. Each sack will weigh between 1000 and 2000 lbs. A lifting apparatus (backhoe, boom truck, or other) is recommended to position the super sack over the biofiltration chamber. Fill the media cages up to the same level as the old media. Replant with vegetation.





MAINTENANCE | DISCHARGE CHAMBER

15. Remove access hatch or manhole cover over discharge chamber.
16. Enter chamber to gain access to the drain down filter. Unlock the locking mechanism and lift up drain down filter housing to remove used BioMediaGREEN filter block as shown below. *NOTE: Drain down filter is only found on units installed in California prior to 2023. If no drain down filter is present, skip steps 16 and 17.*





17. Insert a new BioMediaGREEN filter block and lock drain down filter housing back in place.
18. Replace access hatch or manhole cover over discharge chamber.

NOTES

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Inspection Report
Modular Wetlands Linear

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ___/___/___ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date) Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

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Cleaning and Maintenance Report
Modular Wetlands Linear

Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

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(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:



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Modular Wetlands Maintenance Guide 1/2023

Attachment H
Conditions of Approval

Attachment I
Class V Injection Well Registration

Attachment J
Activity Restrictions

Activity Restrictions

It is the responsibility of the owner to prohibit:

- Vehicle washing, maintenance or repair outside of designated areas
- Hosing down paved areas
- Disposal of animal waste not in appropriate locations
- Use of chemicals, pesticides, toxins, etc. on paved or landscape areas
- Dumping of any waste into drainage facilities
- Blowing or sweeping of debris (leaf litter, grass clippings, litter, etc.) into drainage facilities.
- Discharge of fertilizer or pesticides to drainage facilities
- Keeping dumpsters lids open
- Washing kitchen wastes or kitchen equipment to storm water drainage features
- The owner will inform employees, contractors, etc. that spills are to be swept or vacuumed
- Connections of pool/spa drains to streets or storm drains.
- Discharges of paint or masonry wastes to streets or storm drains

Attachment K
Subsurface Investigation Report (excerpt)

Subsurface Investigation Report

12451 Arrow Route
Rancho Cucamonga, California

April 7 2023

Prepared for:

BTC III Arrow Route CC LP

Prepared by:
Roux Associates, Inc.
5150 E. Pacific Coast Highway, Suite 450
Long Beach, California, 90804

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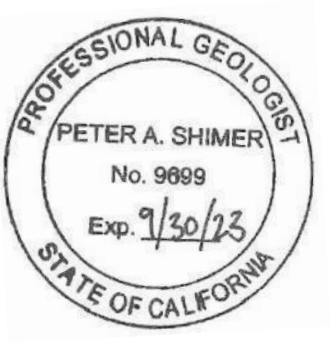
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Subsurface Investigation Report
Former Commercial Metals Company Facility
12451 Arrow Route
Rancho Cucamonga, California

April 7, 2023

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Executive Summary

Roux Associates, Inc. (Roux), on behalf of BTC III Arrow Route CC LP (BTC, CLIENT), has prepared this *Subsurface Investigation Report* (Report) for the 95-acre Former Commercial Metals Company (CMC) facility located at 12451 Arrow Route, Rancho Cucamonga, California (Site; Figure 1). The Site was formerly owned and occupied by CMC and included an inactive rebar fabrication facility and inactive steel mill. The Site is comprised of four parcels (Parcels 1 through 4; Figure 2), which were historically used as follows:

- Parcel 1 was formerly used as an equipment yard, slag material storage, and steel billets storage and had no permanent structures;
- Parcel 2 was formerly developed with a melt shop, warehouse and maintenance building, an old bag house, and a guard shack;
- Parcel 3 was formerly developed with a new bag house, the main office, a parts warehouse, a roll mill, and a bundling station; and
- Parcel 4 was formerly developed with an office and a fabrication shop that included a vehicle wash area.

The Site was acquired by CLIENT in December 2021 and as of the date of this Report was being cleared of all structures in preparation for industrial redevelopment (Figure 3).

Ramboll US Consulting, Inc. (Ramboll) conducted a Phase I Environmental Site Assessment (ESA) and a Phase II Subsurface Investigation of the Site (Ramboll, 2021b and 2021a) in late 2020 and early 2021 on behalf of the former owner. The stated objectives of Ramboll's Phase II investigation were to evaluate: (1) soil and soil vapor conditions across the Site; (2) the extent of subsurface slag, a byproduct of the steel manufacturing process; and (3) subsurface conditions near current and former features such as underground storage tanks (USTs), cooling towers, and storage areas for slag, steel billet, scrap metal and rebar.

Ramboll's key findings included the following:

- Lead was detected in shallow soil samples above the Department of Toxic Substance Control (DTSC) screening level (SL) for Commercial/Industrial Soil (320 milligrams per kilogram [mg/kg] at the time of the Ramboll investigation[1]) in initial borings and in step-out borings near the former warehouse and maintenance buildings (Parcels 2 and 3);
- Total petroleum hydrocarbon (TPH) concentrations in the diesel range ("diesel range organics" or "DRO") in shallow soil samples exceeded the United States Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs; 560 mg/kg) in borings at the southeast corner of Parcel 3 and the western portion of Parcel 2;

[1] The DTSC SL for lead in soil has been updated from 320 mg/kg to 500 mg/kg per the Human Health Risk Assessment (HHRA) Note Number 3, updated in May 2022 by the DTSC Human and Ecological Risk Office (HERO). https://dtsc.ca.gov/wp-content/uploads/sites/31/2022/02/HHRA-Note-3-June2020-Revised-May2022A.pdf

- Volatile organic compounds (VOCs), primarily tetrachloroethene (PCE), were detected in shallow soil vapor at concentrations exceeding the DTSC SL for a commercial/industrial scenario using an attenuation factor of 0.03 (67 micrograms per cubic meter [$\mu g/m^3$]) in the southeastern portion of the Site at Parcel 3; and

- Slag, an operational byproduct containing metals, was found in shallow soils across the western, and southwestern portions of the Site at Parcels 1, 2, and 4.

As part of due diligence prior to Site acquisition by BTC, Roux conducted a Phase I ESA in September 2021 (Roux, 2021) and identified the following Recognized Environmental Conditions (RECs):

- TPH and metals impacts to shallow soil at Parcels 2 and 3, and PCE impacts to shallow soil vapor at Parcel 3, as identified by Ramboll;
- Rail spurs at Parcels 2 and 3;
- An existing 12,000 gallon dual-compartment diesel and gasoline underground storage tank (UST) at Parcel 3;
- A former chemical storage area northwest of the former melt shop on Parcel 2;
- A wash rack in the northern portion of Parcel 2, which had not been previously assessed;
- An inactive former on-Site UST, which historical records suggested had been removed from the Site;
- An inactive subsurface clarifier and aboveground oil recovery system in Parcel 4; and
- Slag materials in soils along the western portion of the Site.

In order to address the RECs and build on Ramboll's data, Roux conducted a Subsurface Investigation in two mobilizations: the first in November 2021 and the second in March 2022 (Figures 4 through 7). Mobilization 1 was implemented to confirm Site environmental conditions prior to BTC's ownership and Mobilization 2 was implemented after BTC became owner to delineate VOC impacts to shallow soil and soil vapor at Parcel 3.

The results of Mobilization 1 confirmed that:

- Soil samples collected along rail spurs at Parcels 2 and 3 indicated that one boring location had PCB concentrations greater than the SLs and one boring location had a SVOC constituent (benzo(a)pyrene) concentration greater than the SL;

- Target chemical concentrations in soil and soil vapor samples at an existing UST, a former chemical storage area, a wash rack, and former USTs were less than commercial/industrial RSLs or SLs;

- Pesticide and herbicide concentrations across the Site were less than the commercial/industrial RSLs or SLs;

- Shallow soils (less than 5 feet bgs) in limited areas near the southern portion of the Site (Parcels 2 and 3) contained DRO and metals concentrations exceeding the commercial/industrial RSLs or SLs; and

- PCE and benzene concentrations in soil vapor samples in portions of Parcel 3 exceeded the conservative SLs.

The results of Mobilization 2 confirmed that:

- VOCs in soil are not present at concentrations above USEPA RSLs or DTSC SLs; and
- PCE concentrations in soil vapor at Parcel 3 were detected within a limited area and significantly decrease with depth, and are laterally and vertically defined.

Based on the results of the Subsurface Investigation, Roux recommends:

1. Evaluation of soil vapor extraction (SVE) as a remedial alternative for shallow VOC impacts to Parcel 3.[2]
2. Additional, limited sampling along the rail spur to delineate the extent of PCB impacts.[3]
3. Additional evaluation of the physical distribution and chemical composition of slag materials in the western portions of the Site.[4]
4. Additional shallow soil sampling to define the limits of metals and DRO impacts to shallow soils at Parcels 2 and 3, and SVOC impacts at Parcel 3.

[2] On July 15, 2022, Roux conducted an SVE pilot, which was documented in a, Soil Vapor Extraction Pilot Test Technical Memorandum, dated October 4, 2022.

[3] A shallow soil investigation in the area of identified polychlorinated biphenyls (PCBs) was conducted in November 2022, which was documented in a *Technical Memorandum, Targeted Shallow Soil Investigation for Polychlorinated Biphenyls, Southeastern Corner of Parcel 3*, dated April 7, 2023.

[4] A focused slag investigation was conducted between September and October 2022, which was documented in a *Slag Investigation Technical Memorandum*, dated April 7, 2023.

1. Introduction

Roux Associates, Inc. (Roux), on behalf of BTC III Arrow Route CC LP (BTC, CLIENT), has prepared this *Subsurface Investigation Report* (Report) for the former Commercial Metals Company (CMC) facility located at 12451 Arrow Route, Rancho Cucamonga, California (Site; Figure 1). The Site was formerly owned and occupied by CMC and included an inactive rebar fabrication facility and inactive steel mill (Figure 2). BTC purchased the Site in December 2021. Demolition of Site structures to facilitate industrial redevelopment began in June 2022 and is anticipated to be completed by mid-2023. A conceptual industrial development plan, which is subject to change, is shown on Figure 3.

Ramboll US Consulting, Inc. (Ramboll) conducted a Phase I Environmental Site Assessment (ESA) and Phase II subsurface investigation on behalf of CMC (the former owner) in 2020 and 2021 (Ramboll, 2021a and 2021b). Ramboll's Site-wide Phase II investigation was intended to assess soil and soil vapor conditions as part of CMC's shut down of operations (Ramboll, 2021b). The Phase II investigation evaluated point-source features of concern, including former underground storage tanks (USTs), clarifiers, cooling towers, chemical storage areas, and former remediation areas. Ramboll evaluated the extent and presence of buried slag by implementing unbiased, Site-wide grid sampling in areas that had not previously been sampled.

As part of due diligence prior to Site acquisition by BTC, Roux conducted a Phase I ESA in September 2021 (Roux, 2021), which identified the six (6) Recognized Environmental Conditions (RECs). In order to assess the identified RECs, Roux conducted a Subsurface Investigation in two mobilizations: the first in October and November 2021 and the second in March 2022 (Figures 4 through 7). The Subsurface Investigation was conducted to evaluate Site conditions relative to intended industrial redevelopment.

1.1 Objectives

The objectives of the Subsurface Investigation were to:

- Evaluate total petroleum hydrocarbon (TPH) concentrations in the diesel range ("diesel range organics" or "DRO") and metals impacts to shallow soil at Parcels 2 and 3, and VOC impacts (primarily tetrachloroethene [PCE]) to shallow soil vapor at Parcel 3, as identified by Ramboll;
- Evaluate shallow soils in the area of former rail spurs at Parcels 2 and 3;
- Evaluate soil and soil vapor at a then-existing[5] 12,000 gallon dual-compartment diesel and gasoline underground storage tank (UST) at Parcel 3;
- Evaluate soil and soil vapor at a former chemical storage area northwest of the former melt shop on Parcel 2;
- Evaluate soil and soil vapor at a wash rack in the northern portion of Parcel 2;

[5] The UST was removed by December 12, 2022 in accordance with permits from the San Bernardino County Fire Protection District (SBCFPD) and Rancho Cucamonga Fire Protection District (RCFPD). Soil sampling was conducted per the permits and showed no indication of hydrocarbon-related impacts; case closure will be requested from the SBCFPD and RCFPD.

- Evaluate soil in the vicinity of an inactive subsurface clarifier and aboveground oil recovery system in Parcel 4; and

- Evaluate soil and soil vapor at an inactive former on-Site UST at Parcel 3, which historical records suggested had been removed from the Site.

The subsurface investigation was completed in two mobilizations; Mobilization 1 was conducted from October to November 2021 and Mobilization 2 was conducted in March 2022. The results of the Subsurface Investigation are presented herein.

1.2 Report Organization

The remaining sections of this Report are organized as follows:

- Section 2 presents general background information, including Site description, Site history, Site geology and hydrogeology, and a summary of previous environmental investigations;
- Section 3 describes the Subsurface Investigation activities;
- Section 4 provides a summary of results and discussion;
- Section 5 summarizes the findings of the investigation and provides conclusions;
- Section 6 presents Roux's recommendations for the Site;
- Section 7 provides a list of references used in this Report.

2. General Background

2.1 Site Information and History

The Site consists of approximately 95 acres of land bounded by Arrow Route to the north and the Atchison Topeka and Santa Fe Railroad (Railroad) to the south and is accessible via Arrow Route and Juneberry Drive. The nearest surface water feature to the Site is Day Creek, approximately 0.24-mile to the west.

The Site was formerly occupied by several related entities: CMC, an inactive steel mill; CMC Rebar, a limited rebar manufacturing facility; and Phoenix Industries, a slag processing facility (slag is an inert byproduct of steel production). The Site operated as a steel mill from the 1950s until 2019 when milling operations were phased out. BTC purchased the property in 2021. The Site is currently vacant and is undergoing demolition in preparation for industrial redevelopment. The Site is generally flat with a stormwater retention basin located along the southern boundary of Parcel 3.

The main address for the Site is 12451 Arrow Route, Rancho Cucamonga, San Bernardino County, California. Additional street addresses historically used at the Site include: 12343, 12353, 12455, and 12459-B Arrow Route. The Site consists of four parcels (Parcels 1 through 4), which are described below and shown on Figure 2:

- Parcel 1 is located in the western portion of the Site and was not historically developed with any permanent structures. CMC utilized the northern portion of Parcel 1 as an equipment boneyard and the southern portion for storage of steel billets. At the time of Roux's Phase I ESA, the majority of Parcel 1 was vacant with some equipment storage in the northern portion and processed slag storage in its central portion.

- Parcel 2 is located in the central and southern portions of the Site. The northern area of Parcel 2 was partially occupied by Phoenix Industries for storage of scrap metal for processing and steel slag that was produced on-Site. On-Site operations consisted of mechanical crushing and sorting of steel slag for off-Site use as aggregate material. No chemical processing of steel slag was conducted on-Site, and no permanent structures were located at this area. The southern portion of Parcel 2 was occupied by the CMC steel mill. The steel mill's primary processing building (melt shop) was previously equipped with an electric arc furnace (EAF) for melting of scrap metal.

- Parcel 3 is located in the eastern portion of the Site. The northern area of Parcel 3 was occupied by CMC's main office building, a fueling station, and a vacant area used for rebar storage. The southern portion of Parcel 3 was developed with the former milling and rolling building.

- Parcel 4 is located in the northern portion of the Site and was occupied by CMC Rebar, which operated a small rebar fabrication facility. An office and fabrication building were located at the northwestern portion of the parcel, which included a maintenance area and a vehicle wash area with an oil collection trench and clarifier. The southern and eastern portions of the parcel were used for parking and rebar storage.

The Site was developed for agricultural use (row crops) from at least 1938 until 1954. A small structure was added to the southeastern corner of the Site in 1953, in the approximate present-day location of an existing groundwater well and water tower. By 1959, the eastern portion of Parcel 3 was developed with the milling and rolling improvements, paved parking areas, outdoor storage yard, office building, water tower, and

multiple rail spurs. The remaining parcels continued to be used for agricultural purposes through at least 1973. By 1975, Parcel 2 and the southern portion of Parcel 1 were graded and likely used for storage of raw, finished, or used materials. The northern portion of the Site remained agricultural until the 1980s when Parcel 4 was developed with the fabrication building. By 1985, agricultural operations had ceased, and the Site was primarily developed for industrial use. The current office building and melt shop at Parcel 2 were added by 1990. Major operations from the 1980s through 2019 included receiving of steel scrap, melting of steel scrap, production and fabrication of rebar, and processing of steel slag.

2.2. Site Geology & Hydrogeology

2.2.1 Site Geology

The Site is located roughly 5 miles to the south of the San Gabriel Mountain Ranges. The Site is underlain by the Chino Subbasin. The Chino Subbasin is bound by geological features such as the Rialto Fault to the east, the Jurupa Mountains to the South, the San Jose Fault to the northwest, and the Cucamonga Fault to the north. Regional source rocks consist of consolidated and semi-consolidated Quaternary fluvial and marine deposits. Depositional facies are primarily alluvium, lake, playa, and terrace deposits. Regional soils are mostly gravelly loamy sands (California Department of Conservation, 2010 Geologic Map).

According to Ramboll's 2021 Phase II Subsurface Investigation Report (Ramboll, 2021a), soil on-Site generally consists of sands and gravel in the upper 5 feet below ground surface (bgs), followed by lenses of sand and silts. This was confirmed during Roux's subsurface investigation conducted in 2021 and 2022.

Lithologic conditions observed by Ramboll and Roux at each parcel are as follows:

- Parcel 1–- Sand with gravel and/or slag to 5 feet bgs (slag was observed to 7.7 feet bgs by Ramboll in some locations), sand and sand with silt to 18 feet bgs, sandy silt to 25 feet bgs
- Parcel 2 – Sand with gravel and/or slag to 5 feet bgs (slag was observed to 10 feet bgs by Ramboll in some locations), sand and sand with silt to 12 feet bgs, silty sand and sand layering to 30 feet bgs
- Parcel 3 – Sand or silty sand to 29 feet bgs and dense silty layer from 29 to 34 feet bgs
- Parcel 4 – Sand and silty sand layers to 5 feet bgs, and sand to 25 feet bgs

Soil boring logs from Roux's Subsurface Investigation are provided in Appendix A.

2.2.2 Site Hydrogeology

The Site is situated along the northeastern portion of the Chino Subbasin within the Upper Santa Ana Valley Groundwater Basin. The Chino Subbasin is bounded on the north by the San Gabriel Mountains (California's Groundwater Bulletin 118, 2004). Nearest tributaries to the Site drain from north to south from the San Gabriel mountains. The nearest surface water feature to the Site is Day Creek, a concrete lined stormwater drainage channel, approximately 0.24-miles to the west.

Based on monitoring well information from the Etiwanda Generating Station (P. Hamilton, 2010) groundwater is estimated at a depth of 430 feet bgs. Ramboll's Phase II Report notes that historical well drillers logs from a well installed at the southeastern corner of the Site to 728 feet bgs in 1956, had depth

to water at 378 feet bgs (Ramboll, 2021a). During Site investigations by Ramboll and Roux, groundwater was not encountered to the maximum depth drilled of 35 feet bgs.

2.3 Key Previous Environmental Investigations

Environmental investigations have been conducted at the Site by various consultants starting in 1987. Some investigations and on-Site environmental work have warranted regulatory agency oversight from the Department of Toxic Substance Control (DTSC); the Santa Ana Regional Water Quality Control Board (SA-RWQCB), or the County of San Bernardino Environmental Management Group. Ramboll's Phase I ESA provided summaries of selected previous Site investigations, as follows (corresponding reports provided in Appendix D of Ramboll's Phase I ESA):

- 1988 Clean Closure Verification (Parcel 4), Slag Trench Remediation Area;
- 1990 Remediation of Lead Contaminated Soil at Southwest Corner of the Site (Parcel 1);
- 1993 UST Removals (Parcel 3);
- 1994 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Preliminary Assessment (PA; Parcels 1, 2, and 3);
- 2001 Preliminary Endangerment Assessment (Parcel 4), Slag Trench Remediation Area;
- 2002 Baghouse Dust Commingled with Slag Stockpile Remediation (Parcels 1 and 2);
- 2006 UST Closure (Parcel 3);
- 2007 Remediation of Soils Impacted with Heavy Metals North of Pad 16 (Parcel 2);
- 2011 UST Removal (Parcel 2); and
- 2014 UST Removal (Parcel 4).

Additional details can be found in the referenced documents and will be included in Roux's forthcoming Preliminary Environmental Assessment Equivalent (PEA-E) Report to be finalized by May 2023.

2.3.1 Phase II Subsurface Investigation Report (Ramboll, 2021a)

Ramboll's Phase II investigation was performed between December 2020 and February 2021, as CMC was shutting down steel mill operations, and was intended to establish "current" soil and soil vapor conditions in preparation for Site closure (Ramboll, 2021a). The Phase II investigation evaluated point-source features of concern, including former USTs, clarifiers, cooling towers, chemical storage areas, and former remediation areas, as well as the extent and presence of buried slag in areas that had not previously been assessed through unbiased, Site-wide grid sampling. Ramboll's figures are included in Appendix B.

Ramboll collected soil and soil vapor samples from 104 borings drilled throughout the Site to depths ranging from 5 to 35 feet bgs. Soil samples were collected and analyzed for metals, VOCs, and TPH at most locations, with select samples also analyzed for hexavalent chromium and/or PCBs. Soil vapor samples were collected at 26 locations and analyzed for VOCs. Ramboll reported that TPH in the diesel range ("diesel range organics" or "DRO"), lead, cadmium, and zinc concentrations were greater than their respective screening levels (SLs) in soil; and chloroform and tetrachloroethene (PCE) concentrations exceeded their respective SLs in soil vapor.

More specifically, Ramboll's key findings included the following:

- Lead concentrations in shallow soil samples exceeded the DTSC SL for Commercial/Industrial Soil (320 milligrams per kilogram [mg/kg] at the time of the Ramboll investigation[6]) in initial borings and in step-out borings near the warehouse and maintenance buildings at Parcel 2 and in the southeast corner of Parcel 3 (Figure 6 in Appendix B);

- DRO concentrations in shallow soil samples exceeded the United States Environmental Protection Agency (USEPA) Regional Screening Level (RSL; 560 mg/kg) in initial borings and in step-out borings in the western boundary of Parcel 2 and the southeast corner of Parcel 3 (Figure 6 in Appendix B);

- PCE and benzene were detected in shallow soil vapor at concentrations exceeding the DTSC SL for a commercial/industrial scenario using an attenuation factor of 0.03 (67 and 14 micrograms per cubic meter [$\mu g/m^3$], respectively) at shallow depths in the western portion of the roll mill and in the area of the parts warehouse at Parcel 3 (Figure 6 in Appendix B). Detections of PCE ranged from 10 to 100,000 $\mu g/m^3$ and benzene detections ranged from 29 to 220 $\mu g/m^3$; and

- Slag was observed in several borings at depths ranging from 0 to 10 feet bgs, primarily on the western portions of the Site.

Ramboll concluded that the investigations did not suggest that on-Site operations had adversely affected groundwater, which was known to be occur at a depth over 400 feet bgs.

2.3.2 Phase I Environmental Site Assessment (Roux, 2021)

Prior to acquisition of the Site by BTC and as part of due diligence activities, Roux conducted a Phase I ESA of the Site in September 2021. The following RECs were identified:

- VOC impacts to soil vapor, and DRO and metals impacts to shallow soils, as identified by Ramboll. This included SL exceedances in soil vapor for chloroform (three locations), benzene (two locations), and PCE (six locations) and in soil for DRO, total cadmium, lead, and zinc.

- Rail spurs at Parcels 2 and 3 were installed by at least 1959. Railroad spurs represent environmental concerns due to potential historical application of oils containing PCBs, herbicides, and arsenic for pest and weed control, as well as the potential presence of creosote on the rail ties, and the historical practice of using coal cinders for track fill material.

- A 12,000-gallon dual-compartment diesel and gasoline underground storage tank (UST) and former fueling station was located at Parcel 3, north of the main office building.

- A former chemical storage area was located northwest of the melt shop on Parcel 2. Moderate staining and cracks were observed, and this area was not previously assessed.

- A wash rack located in the northern portion of Parcel 2. This area was not previously assessed.

[6] The DTSC SL for lead in soil has been updated from 320 mg/kg to 500 mg/kg per the Human Health Risk Assessment (HHRA) Note Number 3, updated in May 2022 by the DTSC Human and Ecological Risk Office (HERO). https://dtsc.ca.gov/wp-content/uploads/sites/31/2022/02/HHRA-Note-3-June2020-Revised-May2022A.pdf

- An inactive subsurface clarifier and aboveground oil recovery system in Parcel 4, which had not been previously assessed.

- Potential inactive on-Site USTs were identified in previous reports and regulatory agency records.

A number of historical RECs (hRECs) also were identified including areas of the Site formerly remediated for slag and lead impacts. Based on a review of historical environmental documents for the Site, Ramboll's investigation data, and RECs identified in the Phase I ESA, Roux recommended and conducted a Subsurface Investigation, as detailed in the following sections.

3. Subsurface Investigation Activities

The Subsurface Investigation was conducted in two mobilizations; the first from October to November 2021 and the second in March 2022. Mobilization 1 was performed prior to BTC's purchase of the Site and the scope of work was focused on confirming Site environmental conditions prior to BTC's ownership of the Site. Mobilization 2 was performed after BTC became owner and the scope of work targeted delineation of PCE impacts to shallow soil and soil vapor at Parcel 3. All activities performed and detailed in this Report were conducted under the supervision of a registered California Professional Geologist or a registered California Professional Engineer.

3.1 Pre-Field Activities

Prior to the start of field activities, Roux prepared a Site-specific HASP to ensure worker safety. In addition to containing information regarding Roux's standard safety practices, the HASP describes potential hazards relating to Site activities and provides the locations and contact information of nearby emergency services. The HASP was kept on-Site when fieldwork occurred and was reviewed and signed by Site workers during the daily tailgate health and safety meeting prior to work each day.

Before each mobilization began, Roux performed a Site visit to mark areas intended for intrusive work. Work areas were marked in white paint along the Site boundaries, and Underground Service Alert of Southern California was notified at least 2 business days prior to the start of intrusive field activities. A private geophysical services and utility locating firm, Atlas Geophysics (Atlas) of San Diego, California, performed a geophysical survey to assess the proposed boring locations prior to each round of drilling. Atlas utilized a variety of tools, including mini ground penetrating radar, to assess locations of buried utilities (i.e., natural gas, electric, water, sewer, telephone, fiber optic, etc.) or obstructions in the area of each boring. Atlas did not identify any subsurface utilities or structures during the geophysical survey that would interfere with the proposed sampling locations and no proposed boring locations were modified.

3.2 Subsurface Investigation Procedures

Investigation procedures, including drilling, soil sampling, soil vapor probe installation, and soil vapor sampling, were generally consistent between Mobilizations 1 and 2. Those procedures are described in this section, and the specific scopes of work for each mobilization are described in Section 3.3.

3.2.1 Drilling and Soil Sampling Procedures

In Mobilizations 1 and 2, soil borings were drilled at the Site by C-57 licensed drillers under the direction of Roux. Borings were drilled using a truck mounted Geoprobe direct-push drill rig. All soil borings were hand augured to 5 feet bgs to minimize the risk of damage to unmarked or unidentified subsurface utilities.

Each soil boring was logged using United Soil Classification System (USCS). Soils were field screened using a photoionization detector (PID) at regular intervals. PID readings and general observations regarding material color and odor encountered at each boring were noted on boring logs. Boring logs can be found in Appendix A.

In the top 5 feet, soil samples were collected directly from the hand auger bucket. Soil samples from deeper than 5 feet bgs were collected directly from acetate liners. All soil samples were collected in laboratory supplied containers and samples selected for VOC analysis were collected using USEPA Method 5035

TerraCore sampling kits. All soil samples were transported under proper chain-of-custody procedures to Enthalpy Analytical, LLC (Enthalpy) of Orange, California, a California state-certified analytical laboratory. Laboratory analytical methods that were used are described below:

- Title 22 metals by USEPA method 6010B;
- Lead by USEPA method 6010B;
- VOCs by USEPA method 8260B with 5035 extraction;
- TPH (Gasoline Range Organics [GRO; C6 to C10], DRO [C10 to C28], and Oil Range Organics [ORO; C28 to C44]) by USEPA method 8015B;
- PCBs by USEPA method 8082;
- OCPs by USEPA method 8081;
- SVOCs by USEPA method 8270C; and
- Chlorinated herbicides by USEPA method 8151.

Drilling equipment was decontaminated in a solution of laboratory-grade detergent and rinsed with distilled water prior to reuse.

3.2.2 Soil Vapor Probe Installation and Sampling Procedures

All soil vapor probes were constructed with new stainless-steel filter probe tip with a 1/4-inch push-to-connect fitting attached to 1/4-inch-diameter Teflon tubing. The probes were constructed by first placing approximately 6 inches of #3 coarse-grained sand into the bottom of the borehole. The sampling tubing with the stainless-steel filter probe tip was then placed within the borehole with a length of PV. Additional sand was then placed in the borehole to create an approximately 1-foot sand pack interval around the vapor tip. Approximately 1 foot of dry granular bentonite was placed on top of the sand pack, followed by hydrated bentonite to the surface. The tubing was labeled with depth of placement and capped using a gas-tight valve set to the "off" position. Each probe was completed with a 6-inch-diameter traffic rated well box. The soil vapor probes were installed in general accordance with the DTSC and Los Angeles Regional Water Quality Control Board and San Francisco Regional Water Quality Control Board Advisory – Active Soil Gas Investigations (Soil Gas Advisory; DTSC, 2015).

Prior to purging or sampling, a minimum 60-second shut-in test at a vacuum of 100 inches of water column was performed at each probe to confirm that the above-ground lines and three-way valves were properly sealed. As a secondary test, a leak check compound (LCC), 1,1-difluoroethane (1,1-DFA), was utilized to check for leaks during sampling and was included among the laboratory analyte list for soil vapor. Upon successful completion of the shut-in test, three purge volumes were subsequently extracted from the sampling system.

Soil vapor samples were collected in 1-liter laboratory supplied batch-certified SUMMA® canisters at a flow with 200 milliliters per minute (mL/min) flow controllers. Upon collection, each sample was immediately labeled with a unique sample identifier. Soil vapor samples were then transported under proper chain-of-custody procedures to Enthalpy. Soil Vapor samples were analyzed for VOCs by USEPA Method TO-15.

Drilling equipment was either dedicated to the sampling location (i.e., it was not reused), or was cleaned in a solution of laboratory-grade detergent and rinsed with distilled water prior to reuse. Soil vapor sampling equipment was not re-used between sampling locations or depth intervals.

Soil vapor probe construction is shown on boring logs (Appendix A).

3.3 Subsurface Investigation – Mobilization 1 (November 2021)

Mobilization 1 was implemented from October 27 through November 8, 2021. The work was intended to address RECs identified in Roux's Phase I ESA and build upon the results of Ramboll's Phase II investigation. In order to accomplish the objectives of the investigation, Confluence Environmental (C-57 License #913194), of Rio Linda, California, was contracted to drill 95 soil borings at the Site under the direction of Roux. Borings were drilled to depths up to 15 feet bgs. Activities included:

- Investigation of the extent of shallow soil lead and DRO exceedances in the vicinity of Ramboll borings RSB-02, RSB-03, RSB-05, and RSB-57 (Figure 6 and 7).
    - 7 samples were collected from three step-out borings at depths of 1, 3, and 5 feet bgs in the vicinity of Ramboll boring RSB-02-W and analyzed for lead;
    - 7 samples were collected from five step-out borings at depths of 1 and 3 feet bgs in the vicinity of Ramboll boring RSB-57 and analyzed for lead;
    - 10 samples were collected from five step-out borings at depths of 1 and 3 feet bgs in the vicinity of Ramboll borings RSB-03-E and RSB-03-S and analyzed for TPH; and
    - 10 samples were collected from seven step-out borings at depths of 1, 3, and 5 feet bgs in the vicinity of Ramboll boring RSB-05 and analyzed for TPH.
- Investigation of shallow soils in the former rail spurs located on Site (borings RR-1 through RR-19, Figures 6 and 7). 38 soil samples were collected from 20 borings at depths of 0.5 and 1.5 feet bgs and analyzed for metals, TPH, VOCs, PCBs, OCPs, SVOCs, and chlorinated herbicides.
- Investigation of the extent of impacted soil vapor in the areas where Ramboll reported elevated concentrations of benzene and PCE (in the vicinity of Ramboll borings RSB-28, RSB-29, RSB-30, RSB-38, RSB-53, RSB-54, RSB-60, and RSB-61, Figures 5 and 7). Soil vapor probes were installed at depths of 5, 10, and 15 feet bgs at 40 locations and samples were analyzed for VOCs. See Table 1 and Appendix A for soil vapor probe construction details.
- Collection of shallow soil samples on the east side of the existing underground storage tank and dispenser at Parcel 3 (boring SB-4, Figure 7). Two samples were collected at 1 and 3 feet and analyzed for TPH.
- Collection of shallow soil samples in the vicinity of the four former diesel USTs at Parcel 3 which were removed in 1993 (borings SB-2 and SB-3, Figures 6 and 7). Four soil samples were collected at depths of 1 and 3 feet bgs in 2 borings and analyzed for metals, VOCs, and TPH.
- Collection of shallow soil samples in the drum storage area adjacent to the former 300-gallon diesel fuel UST on Parcel 2 (boring SB-1, Figure 6). Two soil samples were collected at depths of 1 and 3 feet bgs in 1 boring and analyzed for metals, VOCs, and TPH.

- Collection of shallow soil samples in the vicinity of the vehicle wash rack located in the northern portion of Parcel 2 (borings RSB-70-W and RSB-70-E, Figure 5). 6 soil samples were collected at depths of 1, 3, and 5 feet bgs in 2 borings and analyzed for metals, VOCs, and TPH.

- Collection of shallow soil samples in the vicinity of the former subsurface clarifier and aboveground oil recovery system in Parcel 4 (boring RSB-58-S and RSB-58-W, Figure 5). 6 soil samples were collected at depths of 1, 3, and 5 feet bgs in 2 borings and analyzed for metals, VOCs, and TPH.

All Ramboll and Roux sample locations are shown on Figures 4 through 7, and soil and soil vapor sampling are summarized in the following sections. Refer to Table 1 for sampling rationale and soil vapor probe construction details for the Subsurface Investigation.

3.4 Subsurface Investigation – Mobilization 2 (March 2022)

Mobilization 2 was implemented in March 2022 after BTC became owner to further delineate the extent of VOC impacted soil and soil vapor at Parcel 3 (Figure 7). From March 2 through March 4, 2022, Cascade Drilling and Technical Services (Cascade; C-57 License #1058336), of Santa Ana, California, drilled 34 soil borings at the Site under the direction of Roux.

- Borings were drilled to depths between 15 and 35 feet bgs.

- Soil samples were collected at depths of 5, 15, and 35 feet bgs.

- Soil vapor probes were installed at the same locations and depths as soil samples.

- A total of 63 soil samples were collected and analyzed for VOCs by USEPA method 8260B.

- A total of 63 soil vapor samples were collected and analyzed for VOCs by USEPA Method TO-15.

All sample depths and laboratory analyses are summarized in Table 1. Soil vapor samples were collected on March 7 and 8, 2022, following a 48-hour equilibration period.

3.5 Soil Observations

Soil lithology observed during the Subsurface Investigation was generally consistent with previous investigations. PID screening measurements of soil samples collected ranged from 0.0 to 10.9 parts per million by volume (ppmv) above ambient background. No odor or staining was observed in soil samples. Groundwater was not encountered in this investigation to the maximum depth explored of 35 feet bgs. Slag was observed in some borings placed at the western portion of the Site during drilling. Soil boring logs are provided in Appendix A.

3.6 Investigation Derived Waste

Investigation derived waste (IDW) from Site activities included soils cuttings, concrete/asphalt, coring water, and decontamination water. IDW was stored in 55-gallon drums. Ten drums containing soil and seven drums containing rinsate water were generated and staged within the mobile maintenance warehouse at the southern portion of Parcel 3. Drums were labeled and clearly marked with “pending analysis” labels. Roux collected samples to profile the soil drums and decontamination rinseate. The drums were transported as

non-hazardous waste to Soil Safe in Adelanto, California (soil) and Crosby & Overton in Long Beach, California (water) on October 20, 2022, under proper manifest (Appendix C).

4. Subsurface Investigation Results

This section presents a summary of the findings of Roux's Subsurface Investigation. Results for detected analytes in soil and soil vapor are provided in Tables 2 through 9. Data for select Ramboll boring locations within areas investigated by Roux are also included. Analytical laboratory reports are provided in Appendix D.

4.1 Screening Levels

Soil analytical results were compared to the following soil screening levels:

- USEPA RSLs, dated May 2022 (USEPA, 2022);
- DTSC Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note Number 3 Screening Levels (DTSC SLs), dated May 2022 (DTSC, 2022);[7]
- DTSC HERO HHRA Note Number 11 Southern California Ambient Arsenic Screening Level (DTSC, 2020);
- Kearney Foundation Special Report, Kearney Foundation of Soil Science, Division of Agriculture and Natural Resources, University of California, Background Concentrations of Trace and Major Elements in California Soil (Kearney, 1996)

Soil vapor analytical results were compared to soil vapor screening levels (SVSLs) which were calculated by applying an attenuation factor (AF) of 0.03 to the USEPA Industrial Indoor Air RSLs and DTSC Industrial Indoor Air SLs, in accordance with the February 2023 DTSC Supplemental Guidance: Screening and Evaluating Vapor Intrusion (Final Draft Supplemental Guidance; DTSC, 2023).

4.2 Analytical Results

4.2.1 Lead and TPH Delineation in Soil (Parcels 2 and 3)

In 2020 and 2021, Ramboll collected soil samples in a sitewide grid to evaluate the extent of slag material at the Site (RSB-01 through RSB-24; Figure 4). Lead or TPH impacts were identified in a subset of those samples (RSB-02, RSB-03, and RSB-05). Lead impacts were also identified in Ramboll boring RSB-57, which was installed east of the former mobile maintenance building on Parcel 3. Step-out samples were subsequently collected and analyzed but delineation was not completed. Based on those results, Roux collected additional step-out samples to delineate lead impacts around borings RSB-02-W and RSB-57, and TPH impacts around borings RSB-03 and RSB-05.

- **Borings RSB-02-R1 through R3:** Ramboll boring RSB-02-W had reported lead concentrations of 92.4 mg/kg, 2,040 mg/kg, and 5.0 mg/kg at depths of 1, 3, and 5 feet bgs, respectively. In order to delineate lead impacts, Roux collected seven soil samples from 3 borings placed around RSB-02-W. Roux collected soil samples at depths of 1 and 3 feet bgs in all borings with an additional sample

[7] Although the DTSC SLs for TPH in the aromatic medium carbon range (C9-C16) and aromatic high carbon range (C17-C32) both overlap the DRO analysis carbon range (C10-C28), the aromatic medium SL was lower (500 mg/kg). Thus, it is more conservative and protective of future site users to screen DRO results against the TPH aromatic medium carbon range SL. The TPH aromatic high carbon range SL was used to screen the ORO results.

collected at 5 feet bgs in boring RSB-02-R2 (Figure 8 and Table 2). All samples were analyzed for total lead and reported concentrations ranged between 5.9 mg/kg and 1,700 mg/kg. The sample collected at a depth of 3 feet bgs in the boring placed to the west of Ramboll boring RSB-02-W (RSB-02-R2-3) had a total lead concentration of 1,700 mg/kg, which exceeded the DTSC Commercial/Industrial Soil SL of 500 mg/kg. Based on data collected to date in this area, lead impacts at RSB-02-W occur primarily at 3 feet bgs, and were delineated to the north, south, and east, but not to the west.

- **Borings RSB-57-R1 through R5:** Ramboll borings RSB-57, RSB-57-W, and RSB-57-S had reported lead concentrations of 918 mg/kg, 692 mg/kg, and 775 mg/kg, respectively at a depth of 1 foot bgs. In all three borings lead concentrations in samples collected from 3 and 5 feet bgs were below the DTSC Commercial/Industrial Soil SL of 500 mg/kg. In order to delineate lead impacts, Roux collected seven soil samples from 5 borings at a depth of 1 foot bgs; additionally, 3 foot samples were collected from two borings (RSB-57-R4 and RSB-57-R5). All samples were analyzed for total lead and reported concentrations ranged between 7.4 mg/kg (RSB-57-R1-1) and 2,300 mg/kg (RSB-57-R4-3); see Figure 9 and Table 2. Lead concentrations in two samples collected from boring RSB-57-R4 at 1 foot bgs (780 mg/kg) and 3 feet bgs (2,300 mg/kg) exceeded the DTSC Commercial/Industrial Soil SL of 500 mg/kg (RSB-57-R4-1 and RSB-57-R4-3). Based on data collected to date in this area, lead impacts at RSB-57 primarily occur at 1 foot bgs and need to be further delineated at boring RSB-57-R4.

- **Borings RSB-03-R1 through R5:** Ramboll borings RSB-03, RSB-03-S, and RSB-03-E had reported TPH concentrations in the in diesel range (also referred to as "DRO") of 9,230 mg/kg, 811 mg/kg, and 4,500 mg/kg, respectively, at a depth of 1 foot bgs. In all three borings, DRO concentrations in samples collected from 3 feet bgs were below 10 mg/kg, which is also below the DTSC Commercial/Industrial Soil SL of 500 mg/kg. In order to delineate DRO impacts, Roux collected 10 soil samples from 5 borings at depths of 1 and 3 feet bgs and analyzed all the 1-foot samples for the full TPH carbon chain range and the 3 foot samples for DRO only (Figure 10 and Table 4). Nine of 10 soil samples had reported DRO concentrations above the DTSC Commercial/Industrial Soil SL of 500 mg/kg, with a maximum concentration of 5,700 mg/kg reported for the 1-foot bgs sample collected from boring RSB-03-R1 . All reported TPH concentrations in the gasoline range were less than the reporting limit and all TPH concentrations in the oil range were below the DTSC Commercial/Industrial Soil SL of 18,000 mg/kg. Based on data collected to date in this area, DRO impacts need to be further delineated to the south and west of boring RSB-03.

- **Borings RSB-05-R1 through R7:** Ramboll borings RSB-05, RSB-05-SSW, RSB-05-S2, RSB-05-SSE, and RSB-05-S had reported DRO concentrations that exceeded the DTSC Commercial/Industrial Soil SL of 500 mg/kg at 0.5 and/or 1 foot bgs. Additionally, the DRO concentration from a sample collected at 3 feet bgs in boring RSB-05-S also exceeded 500 mg/kg. In order to delineate DRO impacts, Roux collected 10 soil samples from 7 borings. Samples were collected from 1 foot bgs in all 7 boring locations; a sample from 3 feet bgs was collected at boring locations RSB-05-R1 through R3. Roux analyzed all of the 1-foot bgs samples for the full TPH carbon chain range and the 3 feet bgs samples for DRO only (Figure 11 and Table 4). Four of 10 soil samples had reported DRO concentrations above the DTSC Commercial/Industrial Soil SL of 500 mg/kg, with a maximum concentration of 3,100 mg/kg reported for the 1-foot bgs sample collected from boring RSB-05-R6-1. TPH concentrations in the gasoline range were less than the reporting limit and all TPH concentrations in the oil range were below the DTSC Commercial/Industrial Soil SL of 18,000 mg/kg. Based on data

collected to date in this area, DRO impacts need to be further delineated to the east and west of boring RSB-05.

Based on the results presented above, lead and TPH impacts identified by Ramboll appear to be limited in aerial extent and depth. Further delineation during a future Data Gap Investigation and/or hot spot removal with confirmation soil sampling during redevelopment activities may be appropriate.

4.2.2 Rail Spur (Parcels 2 and 3)

Roux's Phase I ESA identified the lack of sampling along the railroad rail spurs as a REC. Specifically, the Phase I ESA noted that rail spurs have been in place on-Site at Parcels 2 and 3 since at least 1959. Due to the historical application of oils containing PCBs, herbicides, and arsenic for pest and weed control, as well as the potential presence of creosote on the rail ties, and the historical common practice of using coal cinders for track fill material, the on-Site rail spurs were considered a REC in the context of the Phase I ESA. To address this REC, shallow soil samples were collected from 19 borings (RR-1 through RR-19) placed along the rail spurs that encircle the southern half of Parcels 2 and all of 3 (Figure 12). Samples were collected from each boring at depths of 0.5 and 1.5 feet bgs and were analyzed for metals, VOCs, TPH, PCBs, OCPs, SVOCs, and chlorinated herbicides. Analytical results are summarized below.

- **Metals:** Arsenic concentrations exceeded the DTSC Commercial/Industrial Soil SL of 0.36 mg/kg in all samples but one (RR-16-.5), but all were less than the California Upper Confidence Limit background concentration of 12 mg/kg, with the exception of three samples (RR-12-.5, RR-12-1.5, and RR-14-.5), which were between 13 and 15 mg/kg. No other metals exceeded their respective DTSC SLs and/or USEPA RSLs (Table 2). Total chromium concentrations varied with a maximum concentration of 1,100 mg/kg in soil sample RR-3-0.5; total chromium does not have a corresponding DTSC Commercial/Industrial SL or USEPA RSL.

- **VOCs:** Four VOC constituents were detected in 18 of 28 rail spur soil samples. All VOC concentrations were less than their respective DTSC Commercial/Industrial SLs and/or USEPA RSLs (Table 3).

- **TPH:** DRO and ORO were detected in 30 of 38 rail spur soil samples. Concentrations of DRO ranged from 15 to 2,700 mg/kg and 12 samples exceeded the DTSC Commercial/Industrial SL of 500 mg/kg. ORO detections ranged from 22 to 3,200 mg/kg, but were less than the Commercial/Industrial DTSC SL of 18,000 mg/kg (Table 4).

- **Polychlorinated Biphenyls (PCBs):** 24 rail spur soil samples were analyzed for PCBs, and Aroclor-1242 and Aroclor-1260 were the only two PCBs detected. Specifically, samples RR-3-0.5 and RR-3-1.5 had reported Aroclor-1242 concentrations of 130 and 170 mg/kg, respectively, which exceeded the USEPA RSL and DTSC Commercial/Industrial SL of 0.95 and 0.58 mg/kg, respectively. Aroclor-1260 was reported in soil samples RR-7-1.5, RR-9-0.5, and RR-9-1.5 at concentrations of 0.13, 0.22, and 0.32 mg/kg, below the USEPA Commercial/Industrial RSL of 0.99 mg/kg and the DTSC SL of 0.60 mg/kg (Table 5).

- **Organochlorine Pesticides (OCPs):** One OCP, endrin ketone, was detected in one of 24 rail spur soil samples at 11 micrograms per kilogram (µg/kg) (RR-7-0.5; Table 6). There are no established screening levels for this compound.

- **Semi-Volatile Organic Compounds (SVOCs):** SVOCs were detected above laboratory reporting limits in 10 of 24 rail spur soil samples at 0.5 and 1.5 feet bgs. Only one detection, benzo(a)pyrene in RR-12-1.5 (1,800 µg/kg), exceeded the DTSC Commercial/Industrial SL of 1,300 µg/kg (Table 7).

- **Chlorinated Herbicides:** Three of 24 rail spur soil samples contained detections of pentachlorophenol (PCP) above laboratory reporting limits. PCP ranged from 10.2 µg/kg wet (RR-12-1.5) to 52.6 µg/kg wet (RR-4-0.5), less than their respective USEPA Commercial/Industrial RSLs and DTSC SLs. No other chlorinated herbicides were detected (Table 8).

Based on the results presented above, PCBs in the area of boring RR-3 were further investigated in November 2022 and will be documented in a *Technical Memorandum, Targeted Shallow Soil Investigation for Polychlorinated Biphenyls, Southeastern Corner of Parcel 3,* dated April 7, 2023. Further delineation of limited shallow areas with metals, DRO, and/or SVOC screening level exceedances will be presented in a future Data Gap Investigation. Depending on the results of these investigations, hot spot removal with confirmation soil sampling during redevelopment activities may be appropriate.

4.2.3 Former Vehicle Wash Area (Parcel 2)

Two shallow soil borings (RSB-70-E and RSB-70-W, Figure 5) were drilled east and west of a former vehicle wash area at Parcel 2 to screen for metals, VOCs, and TPH associated with former operations in this area. Six soil samples were collected from borings RSB-70-E and RSB-70-W at depths of 1, 3, and 5 feet bgs. 17 metals were detected above laboratory reporting limits; all concentrations were less than their respective screening criteria or background concentrations (Table 2). VOCs were not detected above laboratory reporting limits in any samples (Table 3). DRO and ORO were detected in 3 of the samples at concentrations less than DTSC Commercial/Industrial SLs (Table 4). No impacts were identified associated with former operations in the vicinity of the former vehicle wash area.

4.2.4 Former Drum Storage Area (Parcel 2)

One shallow boring (SB-1, Figure 6) was drilled in a former drum storage area in Parcel 2 to a depth of 3 feet bgs. Samples were collected at depths of 1 and 3 feet bgs, and analyzed for metals, VOCs, and TPH. Eleven metals were detected at concentrations less than their respective screening criteria or background concentrations (Table 2). ORO was detected at 820 mg/kg at 1-foot bgs, which is less than the DTSC Commercial/Industrial SL. The only VOC constituent detected was tert-butyl alcohol (TBA), for which there is no established screening level. No impacts associated with former operations in the vicinity of the former drum storage area were identified.

4.2.5 Open Top Clarifier (Parcel 3)

Soil and soil vapor samples were collected to delineate PCE and benzene impacts around Ramboll borings RSB-28 and RSB-29 at the north and south end of a former open top clarifier, at the southwestern portion of Parcel 3 (Figure 13). RSB-28 and -29 were initially installed and sampled by Ramboll to assess potential leaks/spills in the vicinity of the open top clarifier. Soil samples were collected at various depths up to 30 feet bgs, and analyzed for metals, VOCs, and TPH. Soil vapor samples were collected from 5 and 30 feet bgs for VOC analysis. No impacts to soil were identified by Ramboll; however, benzene was detected in shallow (5 foot bgs) soil vapor samples at concentrations that exceeded the DTSC Commercial/Industrial SL of 14 ug/m^3. No VOCs exceeded their respective SLs in the soil vapor samples collected at 30 feet bgs.

Soil

Nineteen soil samples were collected from 11 borings at depths of 5 and 15 feet bgs and analyzed for VOCs. No VOCs were detected above laboratory reporting limits (Table 3).

Soil Vapor

Thirty-one soil vapor samples were collected and analyzed for VOCs (including 4 duplicates) from 19 step-out boring locations around RSB-28 and RSB-29 at depths of 5 and 15 feet bgs. 20 VOCs were detected, however only benzene and PCE were detected above the USEPA and/or DTSC SVSLs (Table 9).

- **Benzene:** Benzene was detected in 23 soil vapor samples at concentrations ranging from 1.0 $\mu g/m^3$ (RSB-28-R7-15) to 190 $\mu g/m^3$ (RSB-28-R2-5). Of the 23 benzene detections, 11 exceeded the DTSC SVSL of 14 $\mu g/m^3$.

- **PCE**: PCE was detected in 29 soil vapor samples at concentrations ranging from 2.5 $\mu g/m^3$ (RSB-29-R6-5) to 250 $\mu g/m^3$ (RSB-28-R2-5). Of the 29 PCE detections, 12 exceeded the DTSC Commercial/Industrial SVSL of 67 $\mu g/m^3$.

Based on the results presented above, PCE and benzene impacts were delineated vertically and laterally in the area of Ramboll borings RSB-28 and RSB-29; refer to Figures 13, 16, and 17.

4.2.6 Mobile Maintenance Building (Parcel 3)

Soil and soil vapor samples were collected to delineate PCE impacts around Ramboll borings RSB-30 and RSB-60 inside the footprint of the former mobile maintenance building, at the southern portion of Parcel 3 (Figure 14). RSB-30 and -60 were initially installed and sampled by Ramboll to assess potential soil and soil vapor impacts in the vicinity of the mobile maintenance building. Soil samples were collected at various depths up to 15 feet bgs, and analyzed for VOCs. Soil vapor samples were collected from 5 and 15 feet bgs at boring RSB-30 and from 5 feet bgs at boring RSB-60; all soil vapor samples were analyzed for VOCs. No impacts to soil were identified by Ramboll; however, PCE concentrations in soil vapor exceeded the DTSC Commercial/Industrial SVSL of 67 $\mu g/m^3$ for all samples.

Soil

Eleven soil samples were collected at depths ranging from 5 to 35 feet bgs and analyzed for VOCs. TBA was the only VOC detected at 3 locations ranging in concentration from 8.1 $\mu g/kg$ (RSB-60-R8-15) to 19 $\mu g/kg$ (RSB-60-R5-5; Table 3). No screening levels are established for TBA.

Soil Vapor

Twenty-seven soil vapor samples were collected and analyzed for VOCs (including 2 duplicates) from 13 step-out locations at depths ranging from 5 to 35 feet bgs. 26 VOCs were detected in one or more samples, however only benzene, chloroform, PCE, and TCE were detected at concentrations exceeding the USEPA and/or DTSC Commercial/Industrial SVSLs (Table 9).

- **Benzene:** Benzene was detected in 20 soil vapor samples at concentrations ranging from 1.1 $\mu g/m^3$ (RSB-60-R4-5) to 29 $\mu g/m^3$ (RSB-60-R3-5). Of the 20 benzene detections, only one exceeded the DTSC SVSL of 14 $\mu g/m^3$.

- **Chloroform:** Chloroform was detected in 12 soil vapor samples at concentrations ranging from 2.6 μg/m^3 (RSB-60-R8-15) to 86 μg/m^3 (RSB-30-R6-35). Of the 12 chloroform detections, only three exceeded the USEPA SVSL of 18 μg/m^3.

- **PCE**: PCE was detected in all 27 soil vapor samples at concentrations ranging from 13 μg/m^3 (RSB-60-R6-15) to 680 μg/m^3 (RSB-30-R3-5). Of the 27 PCE detections, 22 exceeded the DTSC SVSL of 67 μg/m^3.

- **TCE**: TCE was detected in 25 soil vapor samples at concentrations ranging from 3.8 μg/m^3 (RSB-60-R1-5) to 550 μg/m^3 (RSB-30-R6-35). Of the 25 TCE detections, only four exceeded the USEPA SVSL of 100 μg/m^3.

Based on the results presented above, VOC impacts were delineated vertically and laterally in the area of Ramboll borings RSB-30 and RSB-60; refer to Figures 14, 16, 17, and 18.

4.2.7 ASTs South of Mobile Maintenance Building (Parcel 3)

Soil and soil vapor samples were collected from seven step-out borings to delineate PCE impacts identified in Ramboll boring RSB-38, drilled near the former ASTs south of the mobile maintenance building (Figure 14). Ramboll collected soil samples from boring RSB-38 at 1, 3, and 5 feet bgs and one soil vapor sample from 5 feet bgs; all soil and soil vapor samples were analyzed for VOCs. No impacts to soil were identified by Ramboll; however, the reported PCE concentrations in the 5-foot soil vapor sample exceeded the DTSC Commercial/Industrial SVSL of 67 μg/m^3.

Soil

Seven soil samples were collected at depths ranging from 5 to 15 feet bgs and analyzed for VOCs (Figure 14 and Table 3). The only analyte detected was TBA, which was detected in one boring at 5 and 15 feet bgs at concentrations of 8.6 μg/kg (RSB-38-R5-5) and 14 μg/kg (RSB-38-R5-15). No screening levels are established for TBA.

Soil Vapor

Twelve soil vapor samples were collected and analyzed for VOCs (including 1 duplicate) from 8 step-out locations around RSB-38 ranging in depth from 5 to 35 feet bgs. 16 VOC analytes were detected, with only chloroform, PCE, and TCE were detected at concentrations exceeding the USEPA and/or DTSC Commercial/Industrial SVSLs.

- **Chloroform:** Chloroform was detected in two soil vapor samples at concentrations of 8.0 μg/m^3 (RSB-38-R2-5) and 25 μg/m^3 (RSB-38-R7-35), the latter of which exceeded the USEPA SVSL of 18 μg/m^3.

- **PCE**: PCE was detected in 12 soil vapor samples at concentrations ranging from 3.1 μg/m^3 (RSB-38-R4-15) to 1,000 μg/m^3 (RSB-38-15). Of the 11 PCE detections, four exceeded the DTSC SVSL of 67 μg/m^3.

- **TCE**: TCE was detected in four soil vapor samples at concentrations ranging from 1.8 μg/m^3 (RSB-38-15) to 270 μg/m^3 (RSB-38-R7-35). Of the four TCE detections, one exceeded the USEPA SVSL of 100 μg/m^3.

Based on the results presented above, VOC impacts were delineated vertically and laterally in the area of Ramboll boring RSB-38; refer to Figures 14, 16, 17, and 18.

4.2.8 Parts Warehouse (Parcel 3)

Soil and soil vapor samples were collected from 23 step-out borings to delineate PCE impacts around Ramboll borings RSB-53 and RSB-54 near the former Parts Warehouse in the northern portion of Parcel 3. . Ramboll collected soil samples from borings RSB-53 and RSB-54 at 1, 3, and 5 feet bgs and analyzed them for VOCs; PCE was detected at low concentrations in the 1- and 5-feet bgs samples from boring RSB-54. Ramboll also initially collected soil vapor samples from 5-feet bgs and analyzed them for VOCs; PCE at both locations exceeded the DTSC Commercial/Industrial SVSL of 67 μg/m^3. However, the reported PCE soil vapor concentration in the 5-foot probe at RSB-54 was 100,000 μg/m^3. Ramboll resampled the 5-foot probe at RSB-54 and the reported PCE concentration was 30,000 μg/m^3.

Based on the above, Ramboll installed multiple step-out borings at RSB-54 with soil vapor probes at 5, 15, and 35 feet bgs (15 probes total); all samples were analyzed for VOCs. Laboratory results showed detectable PCE in all vapor samples, with 14 of 15 above the DTSC SVSL of 67 μg/m^3.

Soil

Twenty-six soil samples were collected and analyzed for VOCs from the same depths as corresponding soil vapor probes. Depths for sample collection included 5, 15, and/or 35 feet bgs; all samples were analyzed for VOCs. Laboratory results only showed the VOC constituent TBA at 5 locations and at low concentrations (maximum was 23 μg/kg). There are no established screening levels for TBA.

Soil Vapor

Forty-four soil vapor samples (including 2 duplicates) were collected at depths of 5, 15, and/or 35 feet bgs and analyzed for VOCs. A total of 20 VOC analytes were reported, with PCE and TCE at concentrations exceeding the USEPA and/or DTSC Commercial/Industrial SVSLs.

- **PCE**: PCE was detected in 44 soil vapor samples at concentrations ranging from 2.2 μg/m^3 (RSB-54-E4-15) to 2,500 μg/m^3 (RSB-54-E1-15). Of the 44 PCE detections, 24 exceeded the DTSC SVSL of 67 μg/m^3.
- **TCE**: TCE was detected in 25 soil vapor samples at concentrations ranging from 2.4 μg/m^3 (RSB-54-SE-5) to 520 μg/m^3 (RSB-54-SE-35). Of the 25 TCE detections, two exceeded the USEPA SVSL of 100 μg/m^3.

Based on the results presented above, VOC impacts were delineated vertically and laterally in the area of Ramboll borings RSB-53 and RSB-54; refer to Figures 15, 16, 17, and 18.

4.2.9 Former 1993 UST Footprint (Parcel 3)

Two shallow soil borings (SB-2 and SB-3) were placed within the excavation footprint (east and west ends) at a former fuel UST , which had been removed in 1993 (Figure 6). The objective of the sampling was to evaluate the backfill for metals, VOCs, and TPH; therefore, soil samples were collected from depths of 1 and 3 feet bgs at each boring. 15 metals were detected above laboratory reporting limits, all concentrations were less than their respective screening criteria or background concentrations (Table 2). There were only two VOCs analytes detected, TBA and benzene, both at low concentrations. TBA does not have a screening

level, but the reported benzene concentration was below its respective USEPA RSL and DTSC SL (Table 3). DRO and ORO were detected in all four samples at concentrations less than the DTSC SLs (Table 4). Based on the above results, no impacts associated with the backfill material for the former 1993 UST were identified.

4.2.10 UST and Dispenser (Parcel 3)

One shallow soil boring (SB-4) was drilled within the tank pit and adjacent to a former 12,000 gallon dual-compartment diesel and gasoline UST, which has since been removed, but which was formerly located at the northwestern portion of Parcel 3. (Figure 7). The UST had a dispenser directly over top and the objective was to evaluate whether the dispenser and associated piping may have leaked. Soil samples were collected at 1 and 3 feet bgs and analyzed for TPH. Laboratory results did not show DRO or ORO at concentrations greater than the DTSC Commercial/Industrial SLs. Based on these results, no impacts associated with the UST and dispenser were identified.

4.2.11 Clarifier & Oil Recovery System South of Maintenance Shop (Parcel 4)

Two shallow soil borings (RSB-58-S and RSB-58-W) were drilled in the vicinity of an inactive subsurface clarifier and aboveground oil recovery system in Parcel 4 (Figure 5). Soil samples were collected from each boring at depths of 1, 3, and 5 feet bgs; all samples were analyzed for metals, VOCs, and TPH. 11 metals were detected at concentrations exceeding the laboratory reporting limits, but all concentrations were less than their respective screening criteria or background concentrations (Table 2). VOC concentrations were less than the laboratory reporting limits (Table 3). DRO and ORO were detected at 1-foot bgs in two sample locations at concentrations less than their respective DTSC Commercial/Industrial SLs (Table 4).

Based on these results, no impacts associated with the inactive clarifier and oil recovery system were identified.

4.3 Quality Control and Data Validation and Verification

4.3.1 Field Sample Collection Quality Control

Two trip blanks were included in each cooler containing VOC samples to confirm that cross-contamination did not occur during sample transportation. Samples were labeled TB-01 and TB-02 and were analyzed for VOCs. Neither sample contained detectable concentrations of any VOC analytes.

Four soil vapor duplicate samples and seven soil vapor duplicate samples were collected during the November 2021 and March 2022 investigations, respectively. Duplicate samples were collected at RSB-28-15, RSB-29-15, RSB-30-R1-15, RSB-38-15, RSB-28-R8-15, RSB-29-R4-5, RSB-30-R4-5, RSB-53-R13-15, RSB-54-NE-35, RSB-60-R5-5, and RSB-60-R5-15. All duplicate samples were within a 30% relative precent difference (RPD) from respective parent samples except for RSB-38-15-DUP for TCE, RSB-29-R4-5-DUP for acetone and isopropanol, RSB-30-R4-5-DUP and RSB-60-R5-5-DUP for acetone, RSB-54-NE-35-DUP for isopropanol and RSB-60-R5-15-DUP for acetone and 2-butanone. In each of these cases, the primary and duplicate sample detections were at trace concentrations or non-detect and the difference between the samples was less than one order of magnitude and the data can be considered reliable.

The leak check compound (LCC), 1,1-DFA, was detected in four soil vapor samples (RSB-54-S1-5, RSB-29-R5-5, RSB-38-R4-5, and RSB-60-R6-5). According to the Soil Gas Advisory, “If the concentration of the [liquid] leak check compound is greater than or equal to 10 times the reporting limit for the target analyte(s), then

corrective action is necessary" (DTSC, 2015). Detected concentrations of 1,1-DFA were less than the RL provided by the laboratory, except for RSB-60-R6-5 (1,100 µg/m^3). Therefore, the data for RSB-54-S1-5, RSB-29-R5-5, and RSB-38-R4-5, are usable for their intended purpose. However, data reported for RSB-60-R6-5 may not be reliable for its intended purpose.

The case narratives in some of the laboratory reports from Mobilization 1 noted that numerous samples required dilution due to the dark color of sample extracts for soils or elevated non-target analytes present in soil vapor samples. Roux discussed this with the laboratory and was told that the dark color is most likely due to organic material in the samples and non-target petroleum hydrocarbon compounds for soils and soil vapor, respectively. The laboratory also stated that when a dark color is observed in certain samples, the sample will be diluted as a precaution to not clog the laboratory equipment. A dark color in the sample extract was not observed with all contaminants. All samples having a dark sample extract or containing non-target compounds were reanalyzed to the method detection limit (MDL) and flagged accordingly. In some limited instances the revised reporting limits exceeded the screening levels, particularly for some of the soil vapor samples. However, this factor did not affect the results of the investigation.

4.3.2 Laboratory Quality Control Samples

Laboratory QC samples included matrix spikes and matrix spike duplicates (MS/MSD) to provide information to assess the precision and accuracy of the analysis of the target parameters within the environmental media collected at the Site. The MS portion of the sample is an aliquot of a sample that is spiked (by the laboratory) with a known concentration of the target analyte(s), which provides a measure of the method accuracy. The MSD portion of the sample is a laboratory split sample of the MS and is used to evaluate the precision of the analysis. Appendix D provides all laboratory reports including QC data.

4.3.3 Data Validation and Verification

A Stage 1 data validation was performed by Roux as defined by USEPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use*, dated January 2009 (USEPA, 2009). Data validation was performed in accordance with the guidelines presented in and USEPA's *National Functional Guidelines for Inorganic Superfund Methods Data Review,* dated January 2017 (USEPA, 2017a) and USEPA's *National Functional Guidelines for Organic Superfund Methods Data Review*, dated January 2017 (USEPA, 2017b). Stage 1 validation includes verification based on "completeness and compliance checks of sample receipt conditions and only sample-related QC results."

Sample analyses were found generally compliant with the method requirements, and the sample data, with the possible exception of RSB-60-R6-5, were determined to be useable, with qualification of some sample results/detection limits as quantitatively estimated ("b" qualifier). Samples with high dilution and analyzed to the lab MDLs were flagged with a "J" qualifier. All data were considered useable for their intended purpose.

5. Summary and Conclusions

Roux implemented a Subsurface Investigation in two mobilizations at the Site to build on Ramboll's investigations and to address RECs identified by Roux in a Phase I ESA. The objectives of the investigations were met, and the bullet list below provides a summary of the investigation results.

- Metals, DRO, and SVOC (RR-12 only) concentrations in shallow soils at localized areas of the Site will require additional delineation and potential hot spot removal during redevelopment activities.

- VOC concentrations in soil across the Site were either non-detect or detected at concentrations less than their respective DTSC SLs or USEPA RSLs in all samples.

- Soil vapor analytical results indicate that PCE is elevated in a small portion of Parcel 3. PCE impacts have been delineated both vertically and laterally and are highest in concentration between 5 and 15 feet bgs, with significant attenuation at 35 feet bgs. A soil vapor extraction pilot test was implemented at the Site and is documented in a separate Technical Memorandum.

- Limited impacts from PCBs have been investigated and are documented in a separate Technical Memorandum.

- Physical distribution and chemical makeup of slag materials has been investigated and are documented in a separate Technical Memorandum.

6. Recommendations

Site data confirm that industrial redevelopment of the Site is feasible; however, additional environmental investigations and remedial evaluation will be necessary prior to initiation of Site development activities. Roux provides the following recommendations, some of which have been implemented, as summarized below:

1. Evaluation of soil vapor extraction (SVE) as a remedial alternative for shallow soil vapor VOC impacts to Parcel 3.

   An SVE pilot test was performed on July 15 and 16, 2022, to evaluate SVE as a potentially viable full-scale remedial technology for cleanup of VOCs (namely PCE and benzene) at Parcel 3. Roux prepared a SVE Pilot Test technical memorandum (TM), dated October 4, 2022, to document SVE pilot testing activities conducted on July 15 and 16, 2022 at the Site. The SVE Pilot Test TM provides the technical details, rationale, and results of the pilot testing activities conducted at the Site, including SVE well installation on June 24, 2022. Based on the results of the SVE pilot test, SVE was confirmed as an effective technology for remediation of VOC-impacted soil vapor at the Site.

2. Additional sampling at the rail spurs to delineate the extent of PCB impacts.

   A targeted shallow soil investigation was conducted on November 10, 2022, and targeted a small area of Parcel 3, near the southeastern corner of the Site, where shallow soil sampling showed PCBs at concentrations greater than screening levels along a former rail spur. Based on the results of PCB sampling, Roux concluded that PCB impacts at the Site do not appear to be significant and/or widespread. Roux prepared a TM, dated March 2, 2023, to document the targeted soil investigation procedures and findings.

3. Evaluation of slag materials along the western portion of the Site.

   Pothole and trenching investigation and sampling activities were conducted at the Site between September 14 and October 11, 2022. The slag investigations were performed to further assess the distribution, as well as the physical and chemical characteristics of subsurface slag at the Site. Based on the results of the slag investigation, the distribution and thickness of slag materials are well understood, as are the physical characteristics of slag and slag materials. Leachability analysis performed by Roux and Ramboll at locations with the highest concentrations of metals indicated that slag materials do not have a significant leaching potential, with only one location (Ramboll location RSB-02) exceeding STLC or TCLP limits. Roux prepared a Slag Investigation TM, dated March 24, 2023, to document the slag investigation procedures and findings.

4. Additional shallow soil sampling to define DRO and metals impacts at Parcels 2 and 3, and SVOC impacts at Parcel 3. The additional sampling will be presented in a forthcoming Data Gap Investigation Workplan and will define soils that may need to be removed from the Site or evaluated for potential on-Site treatment and reuse.

7. References

California Department of Toxic Substances Control, 2008. Determination of a Southern California Regional Background Arsenic Concentration in Soil, 2008.

California Department of Toxic Substances Control, California Water Resources Control Boards, 2020. "Supplemental Guidance: Screening and Evaluating Vapor Intrusion – Draft for Public Comments," February.

California Department of Toxic Substances Control Human and Ecological Risk Office, 2022. "Human Health Risk Assessment (HHRA) Note Number 3, DTSC-modified Screening Levels (DTSC-SLs)," May.

California Environmental Protection Agency, 2015. "Advisory – Active Soil Gas Investigations," Department of Toxic Substances Control, Los Angeles Regional Water Quality Control Board, and San Francisco Regional Water Quality Control Board, July.

P. Hamilton, Engineering Geologist, 2010. *Annual Groundwater Monitoring Report, Groundwater Detection Monitoring Program with Fourth Quarter 2009 Sampling Data, Etiwanda Generating Station, 8996 Etiwanda Avenue, Rancho Cucamonga, California,* February 7.

Ramboll US Consulting, Inc., 2021a. *Phase II Subsurface Investigation Report, 12459-B Arrow Route, Rancho Cucamonga, California,* April 28.

Ramboll US Consulting, Inc., 2021b. *Phase I Environmental Site Assessment, 12459-B Arrow Route, Rancho Cucamonga, California,* June.

Roux Associates, Inc., 2021a. *Phase I Environmental Site Assessment, 12459-B Arrow Route, Rancho Cucamonga, California,* December 27.

United States Environmental Protection Agency (USEPA), 2009. "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," January.

USEPA, 2017a. "National Functional Guidelines for Inorganic Superfund Methods Data Review", January.

USEPA, 2017b. "National Functional Guidelines for Organic Superfund Methods Data Review", January.

United States Environmental Protection Agency, 2022. "Regional Screening Levels (RSLs) – Generic Tables," May.

TABLES

1. Sample Analysis Plan
2. Soil Analytical Results – Metals
3. Soil Analytical Results – Volatile Organic Compounds (VOCs)
4. Soil Analytical Results – Total Petroleum Hydrocarbons (TPH)
5. Soil Analytical Results – Polychlorinated Biphenyls (PCBs)
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Table 1
Sampling Analysis Plan
12451 Arrow Route, Rancho Cucamonga, California

Location	Current Borings	Boring Dates	Historical Borings	Scope of Work	Soil Sample Depth (feet bgs)	Analytical Suite	Soil Vapor Probe Depth (feet bgs)	Rationale
24 locations in a sitewide grid	RSB-01 to RSB-24	12/2020 - 02/2021	N/A	Each boring to 5 feet bgs.	0.5-1 2.5-3 4.5-5	Metals, VOCs & TPH	-	Evaluation of the extent of slag material at the site. Parcel 1 and 2 in the southwestern corner of the Site, including areas of adjacent neighboring properties, were remediated for lead impacts. This area received a NFA status from the RWQCB-SA on November 7, 1990. As a result of these activities, the Site is listed in the SLIC database with closed status.
3 locations N, S, and W of RSB-02-W	RSB-02-R1 to R3	11/2021	RSB-02-W	Delineation of lead impacts around RSB-02-W	1, 3, 5 (R2 only)	Lead	-	Delineation of shallow lead impacts in Parcel 2
5 locations N, S, and E of RSB-03-E and W and S of RSB-03-S	RSB-03-R1 to R5	11/2021	RSB-03-E and -S	Delineation of TPH impacts around RSB-03	1, 3	TPH	-	Delineation of shallow TPH impacts in Parcel 3
7 locations N, S, E, and W of RSB-05-S	RSB-05-R1 to R7	11/2021	RSB-05, -SCL, -S, -SSW, -S2, and -SSE	Delineation of TPH impacts around RSB-05	1, 3, 5 (R5 only)	TPH	-	Delineation of shallow TPH impacts in Parcel 2
Two borings (one at north end & one at south end) near open top clarifier in Parcel 3	RSB-28, RSB-29	12/1/2020	N/A	2 borings to 30 feet bgs, one on north end and one on south end. Vapor probes at 5 & 30 feet bgs.	0.5-1 2.5-3 4.5-5 9.5-10 14.5-15 19.5-20 24.5-25 29.5-30	Metals, VOCs & TPH	5, 30	Assess potential leaks/spills in the vicinity of the noted feature (during site walks conducted by Ramboll in 2020).
One soil vapor boring adjacent to RSB-28	RSB-28	12/2020	RSB-28	1 boring to 15 feet	NA	VOCs	15	Evaluate 15 foot sample at RSB-28 in Parcel 3
Three step-out soil vapor borings NW, NE, and SW of RSB-28	RSB-28-R1 to R3	11/2021	RSB-28	3 borings to 5 feet bgs	NA	VOCs	5	Delineate benzene and PCE impacts around RSB-28 in Parcel 3
Five step-out soil vapor borings N, S, E, and W of RSB-28	RSB-28-R4 to R8	3/2022	RSB-28	5 borings to 15 feet bgs	5, 15 (R8 only 15)	VOCs	5, 15 (R8 only 15)	Delineate benzene and PCE impacts around RSB-28 in Parcel 3
One soil vapor boring adjacent to RSB-29	RSB-29	12/2020	RSB-29	1 boring to 15 feet	NA	VOCs	15	Evaluate 15 foot sample at RSB-29
Three step-out soil vapor borings N, S, and W of RSB-29	RSB-29-R1 to R3	11/2021	RSB-29	3 borings to 5 feet bgs	NA	VOCs	5	Delineate benzene and PCE impacts around RSB-29 in Parcel 3
Six step-out soil vapor borings N, S, E, and W of RSB-29	RSB-29-R4 to R9	3/2022	RSB-29	6 borings to 15 feet bgs	5, 15 (R8 and R9 only 15)	VOCs	5, 15 (R8 and R9 only 15)	Delineate benzene and PCE impacts around RSB-29 in Parcel 3
Two borings within mobile maintenance building in Parcel 3	RSB-30, RSB-60	12/2020 - 1/2021	N/A	2 borings, one boring near drain to 15 feet bgs, one boring near broken asphalt to 5 feet bgs. Vapor probes at 5 & 15 feet bgs.	0.5-1 2.5-3 4.5-5 9.5-10	Metals, VOCs & TPH	5, 15 (RSB-60 only 5)	Assess potential leaks/spills in the vicinity of the noted feature (during site walks conducted by Ramboll in 2020).

Table 1
Sampling Analysis Plan
12451 Arrow Route, Rancho Cucamonga, California

Location	Current Borings	Boring Dates	Historical Borings	Scope of Work	Soil Sample Depth (feet bgs)	Analytical Suite	Soil Vapor Probe Depth (feet bgs)	Rationale
Three step-out soil vapor borings E, S, and W of RSB-30	RSB-30-R1 to R3	11/2021	RSB-30	3 borings to 5 feet bgs	NA	VOCs	5, 15	Delineate PCE impacts around RSB-30 in Parcel 3
Two step-out soil vapor borings NW and SW of RSB-30	RSB-30-R4 and R5	3/2022	RSB-30	6 borings to 15 feet bgs	5, 15	VOCs	5, 15	Delineate PCE impacts around RSB-30 in Parcel 3
One deep soil vapor boring adjacent to RSB-30	RSB-30-R6	3/2022	RSB-30	1 boring to 35 feet bgs	35	VOCs	35	Delineate PCE impacts around RSB-30 in Parcel 3
Two step-out soil vapor borings NW and NE of RSB-60	RSB-60-R5 and R6	3/2022	RSB-60	2 borings to 15 feet bgs	5, 15	VOCs	5, 15	Delineate PCE impacts around RSB-60 in Parcel 3
One deep soil vapor boring adjacent to RSB-60	RSB-60-R8	3/2022	RSB-60	1 boring to 35 feet bgs	15, 35	VOCs	35	Delineate PCE impacts around RSB-60 in Parcel 3
One boring near ASTs south of mobile maintenance building in Parcel 3	RSB-38	12/1/2020	N/A	1 angled boring under AST to 5 feet bgs. Vapor probe at 5 feet bgs.	0.5-1 2.5-3 4.5-5	Metals, VOCs & TPH	5	Based on historical review conducted as part of Ramboll's 2020 Phase I ESA, the area in the vicinity of the ASTs located south of the Mobile Maintenance building at the Site on Parcel 3 exhibited significant staining.
One soil vapor boring adjacent to RSB-38	RSB-38	11/2021	RSB-38	1 boring to 15 feet	NA	VOCs	15	Evaluate 15 foot sample at RSB-38
Three step-out soil vapor borings N, S, and E of RSB-38	RSB-38-R1 to R3	11/2021	RSB-38	3 borings to 5 feet bgs	NA	VOCs	5	Delineate PCE impacts around RSB-38 in Parcel 3
Two step-out soil vapor borings NW and SW of RSB-38	RSB-38-R4 and R6	3/2022	RSB-38	3 borings to 15 feet bgs	5, 15	VOCs	5, 15	Delineate PCE impacts around RSB-38 in Parcel 3
One deep soil vapor boring adjacent to RSB-38	RSB-38-R7	3/2022	RSB-38	1 boring to a depth of 35 feet bgs	35	VOCs	35	Delineate PCE impacts around RSB-38 in Parcel 3
Two borings within building in central portion of Parcel 3	RSB-53, RSB-54	12/1/2020	N/A	2 borings to 5 feet bgs. Vapor probes at 5 feet bgs.	0.5-1 2.5-3 4.5-5	Metals, VOCs & TPH	5	Assess potential leaks/spills in the vicinity of the noted feature (during site walks conducted by Ramboll in 2020).
One soil vapor boring adjacent to RSB-53	RSB-53	11/2021	RSB-53	1 boring to 15 feet	NA	VOCs	15	Evaluate 15 foot sample at RSB-53
Seven step-out soil vapor borings N, S, E, and W of RSB-53	RSB-53-R1 to R7	11/2021	RSB-53	7 borings to 5 feet bgs	NA	VOCs	5	Delineate PCE impacts around RSB-53 in Parcel 3
Six step-out soil vapor borings N, W, and S of RSB-53	RSB-53-R8 to R13	3/2022	RSB-53	6 borings to 15 feet bgs	5, 15 (R11 and R12 only 15)	VOCs	5, 15 (R11 and R12 15 only)	Delineate PCE impacts around RSB-53 in Parcel 3
Two deep soil vapor borings E and W of RSB-53	RSB-53-R14 and R15	3/2022	RSB-53	2 borings to 35 feet bgs	15 and 35 (R14 only 35)	VOCs	15 and 35 (R14 only 35)	Delineate PCE impacts around RSB-53 in Parcel 3
Two step-out soil vapor borings E of RSB-54-E	RSB-54-E1 and E2	11/2021	RSB-54-E	2 borings to 15 feet bgs	NA	VOCs	5, 15	Delineate PCE impacts around RSB-54 in Parcel 3
One deep step-out soil vapor borings E of RSB-54-E	RSB-54-E3	3/2022	RSB-54-E	1 boring to 35 feet bgs	35	VOCs	35	Delineate PCE impacts around RSB-54 in Parcel 3
One deep step-out soil vapor borings E of RSB-54-E	RSB-54-E4	3/2022	RSB-54-E	1 boring to 35 feet bgs	5, 15, 35	VOCs	5, 15, 35	Delineate PCE impacts around RSB-54 in Parcel 3

Table 1
Sampling Analysis Plan
12451 Arrow Route, Rancho Cucamonga, California

Location	Current Borings	Boring Dates	Historical Borings	Scope of Work	Soil Sample Depth (feet bgs)	Analytical Suite	Soil Vapor Probe Depth (feet bgs)	Rationale
Three step-out soil vapor borings W and N of RSB-54-N	RSB-54-E1 and E2	11/2021	RSB-54-N	2 borings to 15 feet bgs	NA	VOCs	15	Delineate PCE impacts around RSB-54 in Parcel 3
One boring east of mobile maintenance building in Parcel 3	RSB-57	12/2020-1/2021	N/A	1 boring to 5 feet bgs.	0.5-1 2.5-3 4.5-5	Metals, VOCs & TPH	-	Assess potential leaks/spills in the vicinity of the noted feature (during site walks conducted by Ramboll in 2020).
Five step-out borings S and W of RSB-57	RSB-57-R1 to R5	11/2021	RSB-57 and step-outs	3 borings to 1 foot, 2 borings to 3 feet bgs	1, 3	Lead	-	Delineation of shallow lead impacts in Parcel 3
One boring near drain in Parcel 4 south of maintenance shop	RSB-58	12/2020	N/A	One boring to 5 feet bgs.	0.5-1 2.5-3 4.5-5	Metals, VOCs & TPH	-	Assess potential leaks/spills in the vicinity of the noted feature (during site walks conducted by Ramboll in 2020).
Two step-out borings S and W of RSB-58	RSB-58-S and W	11/2021	RSB-58	2 borings to 5 feet	1, 3, 5	Metals, VOCs & TPH	-	Additional sampling in area of oil collection trench and clarifier in Parcel 4
Two shallow soil borings on the east and west ends of the vehicle wash area	RSB-70-E and W	11/2021	NA*	2 borings to 5 feet	1, 3, 5	Metals, VOCs & TPH	-	Assess the former Vehicle Wash Area in Parcel 2
Shallow soil boring in the former drum storage area in Parcel 2	SB-1	11/2021	NA*	1 boring to 3 feet	1, 3	Metals, VOCs & TPH	-	Assess the former drum storage area in Parcel 2
Two shallow soil borings on the east and west ends of the former 1993 UST footprint in Parcel 3	SB-2 and SB-3	11/2021	NA*	2 borings to 3 feet	1, 3	Metals, VOCs & TPH	-	Assess conditions in the former tank footprint in Parcel 3
Shallow soil boring adjacent to the existing (at the time) UST and dispenser in Parcel 3	SB-4	11/2021	NA*	1 borings to 3 feet	1, 3	TPH	-	Assess conditions adjacent to the tank in Parcel 3
19 borings along the rail spur in Parcels 2 and 3	RR-1 to RR-19	11/2021	NA*	19 borings to 1.5 feet	0.5, 1.5	Metals, VOCs, TPH. PCBs, OCPs, SVOCs, chlorinated herbicides in 12 of 19 borings only.	-	Assess conditions along the rail spurs in Parcels 2 and 3

Notes:

Shading indicates Ramboll boring locations
bgs = below ground surface
NA = Not applicable
VOCs = Volatile Oragnic Chemicals
TPH = Total Petroleum Hydrocarbons
PCBs = Polychlorinated Biphenyls
PCE = Tetrachloroethene
UST = Underground Storage Tank
AST = Aboveground Storage Tank
NFA = No Further Action letter
RWQCB-SA = Regional Water Quality Control Board - Santa Ana
SLIC = Spills, Leaks, Investigation, and Cleanup sites
OCPs = Organochlorine Pesticides
SVOCs = Semi-Volatile Organic Compounds
Cl Herbicides = Chlorinated Herbicides

Table 2
Soil Analytical Results - Metals
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Analytical Method			**USEPA Method 6010B/7141A**																
Unit			**mg/kg**																
DTSC Commercial/Industrial Soil SL			**NS**	**0.36**	**NS**	**230**	**79**	**NS**	**NS**	**NS**	**500**	**4.4**	**NS**	**11,000**	**NS**	**NS**	**NS**	**NS**	**NS**
USEPA Industrial Soil RSL			**470**	**3**	**220,000**	**2,300**	**100**	**NS**	**350**	**47,000**	**800**	**46**	**5,800**	**22,000**	**5,800**	**5,800**	**12**	**5,800**	**350,000**
California Upper Confidence Limit [1]			**NS**	**12**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
RSB-02-1	1	1/4/2021	<5.00	<5.00	**82.2**	<0.50	**1.4**	**11.8**	**6.5**	**9.9**	**10.8**	<0.02	<0.50	**8.6**	<5.00	<0.50	<5.00	**28.9**	**69**
RSB-02-3	3	1/4/2021	<5.00	<5.00	**102**	<0.50	**55.6**	**NA**	**8.0**	**157**	**2,910**	**0.071**	**7.40**	**23.4**	<5.00	<0.50	<5.00	**26.1**	**11,900**
RSB-02-5	5	1/4/2021	<5.00	<5.00	**102**	<0.50	**1.9**	**16.7**	**9.5**	**17.2**	**4.4**	<0.02	<0.50	**11.5**	<5.00	<0.50	<5.00	**38.6**	**74.4**
RSB-02-N-1	1	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**52.4**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-N-3	3	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**51.0**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-N-5	5	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**4.1**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-W-1	1	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**92.4**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-W-3	3	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**2,040**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-W-5	5	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**5.0**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-S-3	3	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**14.7**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-S-5	5	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**3.3**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-E-1	1	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**91.5**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-E-3	3	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**8.3**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-E-5	5	1/26/2021	NA	NA	NA	NA	NA	NA	NA	NA	**3.6**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-R1-1	1	11/4/2021	NA	NA	NA	NA	NA	NA	NA	NA	**10**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-R1-3	3	11/4/2021	NA	NA	NA	NA	NA	NA	NA	NA	**28**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-R2-1	1	11/4/2021	NA	NA	NA	NA	NA	NA	NA	NA	**120**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-R2-3	3	11/4/2021	NA	NA	NA	NA	NA	NA	NA	NA	**1,700**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-R2-5	5	11/4/2021	NA	NA	NA	NA	NA	NA	NA	NA	**5.9**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-R3-1	1	11/4/2021	NA	NA	NA	NA	NA	NA	NA	NA	**34**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-02-R3-3	3	11/4/2021	NA	NA	NA	NA	NA	NA	NA	NA	**57**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-43-1	1	12/23/2020	<5.00	<5.00	**253**	<0.50	**105**	**181**	**7.9**	**82.6**	**190**	0.050	2.5	**26.3**	<5.00	<0.50	<5.00	**59.4**	**1,520**
RSB-43-3	3	12/23/2020	<5.00	<5.00	**224**	<0.50	**2.3**	**20**	**6.2**	**14.1**	**35**	<0.02	<0.50	**12.5**	<5.00	<0.50	<5.00	**30.8**	**252**
RSB-43-5	5	12/23/2020	<5.00	<5.00	**265**	<0.50	**1.70**	**17**	**8.6**	**15.3**	**3.2**	<0.02	<0.50	**10.8**	<5.00	<0.50	<5.00	**37.3**	**112**
RSB-43-10	10	12/23/2020	<5.00	<5.00	**199**	<0.50	**0.90**	**11**	**4.6**	**6.9**	**1.5**	<0.02	<0.50	**6.1**	<5.00	<0.50	<5.00	**23.1**	**82**
RSB-43-15	15	12/23/2020	<5.00	<5.00	**168**	<0.50	**0.70**	**6.0**	**3.8**	**4.2**	**1.0**	<0.02	<0.50	**3.7**	<5.00	<0.50	<5.00	**16.8**	**73**
RSB-57-1	1	1/7/2021	<5.00	<5.00	**297**	<0.50	<0.50	**203**	**24.3**	**486.0**	**918**	0.696	15.1	**94.4**	<5.00	<0.50	<5.00	**33.6**	**2,310**
RSB-57-3	3	1/7/2021	<5.00	<5.00	**324**	<0.50	**10.8**	**60.4**	**10.4**	**204.0**	**401**	0.085	<0.50	**66.7**	<5.00	<0.50	<5.00	**23.9**	**960**
RSB-57-5	5	1/7/2021	<5.00	<5.00	**80.5**	<0.50	**1.2**	**10.4**	**6.4**	**9.7**	**5.6**	<0.02	<0.50	**7.7**	<5.00	<0.50	<5.00	**26.2**	**53.5**
RSB-57-N-1	1	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**2.7**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-N-3	3	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**3.3**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-N-5	5	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**3.6**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-W-1	1	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**692**	NA	NA	NA	NA	NA	NA	NA	NA

Table 2
Soil Analytical Results - Metals
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Analytical Method			**USEPA Method 6010B/7141A**																
Unit			**mg/kg**																
DTSC Commercial/Industrial Soil SL			**NS**	**0.36**	**NS**	**230**	**79**	**NS**	**NS**	**NS**	**500**	**4.4**	**NS**	**11,000**	**NS**	**NS**	**NS**	**NS**	**NS**
USEPA Industrial Soil RSL			**470**	**3**	**220,000**	**2,300**	**100**	**NS**	**350**	**47,000**	**800**	**46**	**5,800**	**22,000**	**5,800**	**5,800**	**12**	**5,800**	**350,000**
California Upper Confidence Limit [1]			**NS**	**12**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
RSB-57-W-3	3	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**53.1**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-W-5	5	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**5.5**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-S-1	1	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**775**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-S-3	3	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**4.2**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-S-5	5	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**14.8**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-E-1	1	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**78.9**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-E-3	3	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**3.0**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-E-5	5	1/27/2021	NA	NA	NA	NA	NA	NA	NA	NA	**2.8**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-R1-1	1	11/5/2021	NA	NA	NA	NA	NA	NA	NA	NA	**7.4**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-R2-1	1	11/5/2021	NA	NA	NA	NA	NA	NA	NA	NA	**170**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-R3-1	1	11/5/2021	NA	NA	NA	NA	NA	NA	NA	NA	**94**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-R4-1	1	11/5/2021	NA	NA	NA	NA	NA	NA	NA	NA	**780**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-R4-3	3	11/5/2021	NA	NA	NA	NA	NA	NA	NA	NA	**2,300**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-R5-1	1	11/5/2021	NA	NA	NA	NA	NA	NA	NA	NA	**330**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-57-R5-3	3	11/5/2021	NA	NA	NA	NA	NA	NA	NA	NA	**9.1**	NA	NA	NA	NA	NA	NA	NA	NA
RSB-58-1	1	12/16/2020	<5.00	<5.00	**130**	<0.50	**1.4**	**22**	**7.6**	**13**	**3.5**	<0.02	<0.50	**12**	<5.00	<0.50	<5.00	**40**	**36**
RSB-58-3	3	12/16/2020	<5.00	<5.00	**153**	<0.50	**1.5**	**26**	**8.0**	**15**	**4.1**	<0.02	<0.50	**14**	<5.00	<0.50	<5.00	**46**	**35**
RSB-58-5	5	12/16/2020	<5.00	<5.00	**107**	<0.50	**1.6**	**15**	**8.6**	**12**	**3.0**	<0.02	<0.50	**10**	<5.00	<0.50	<5.00	**37**	**45**
RSB-58-S-1	1	11/3/2021	<2.7	**1.1**	**280**	**1.0**	<0.45	**100**	**6.2**	**19**	**5.4**	<0.14	<0.91	**11**	<2.7	**0.74**	<2.7	**100**	**39**
RSB-58-S-3	1	11/3/2021	<2.8	<0.9	**160**	<0.5	<0.5	**33**	**8.0**	**18**	**5.7**	<0.2	<0.9	**20**	<2.8	<0.5	<2.8	**46**	**40**
RSB-58-S-5	5	11/3/2021	<2.7	**1.3**	**130**	<0.45	<0.45	**22**	**8.2**	**15**	**4.8**	<0.14	<0.91	**14**	<2.7	<0.45	<2.7	**44**	**53**
RSB-58-W-1	1	11/3/2021	<2.9	<1.0	**160**	<0.49	<0.49	**26**	**7.9**	**17**	**5.7**	<0.14	<1.0	**17**	<2.9	<0.49	<2.9	**49**	**43**
RSB-58-W-3	3	11/3/2021	<2.6	<0.88	**160**	<0.44	<0.44	**29**	**7.7**	**15**	**4.0**	<0.15	<0.88	**17**	<2.6	<0.44	<2.6	**48**	**40**
RSB-58-W-5	5	11/3/2021	<3.1	**1.8**	**170**	<0.52	<0.52	**23**	**10**	**19**	**5.9**	<0.16	<1.0	**16**	<3.1	<0.52	<3.1	**56**	**64**
RSB-70-W-1	1	11/3/2021	**9.0**	**9.5**	**300**	**0.45**	**1.0**	**1,200**	**17**	**580**	**150**	**1.0**	**28**	**120**	**6.8**	**0.56**	**2.8**	**110**	**590**
RSB-70-W-3	3	11/3/2021	<3.0	**1.6**	**150**	<0.50	<0.50	**21**	**10**	**19**	**6.1**	<0.17	<1.0	**15**	<3.0	<0.50	<3.0	**50**	**65**
RSB-70-W-5	5	11/3/2021	<2.9	**1.1**	**120**	<0.48	<0.48	**17**	**8.0**	**14**	**4.5**	<0.15	<1.0	**12**	<2.9	<0.48	<2.9	**43**	**52**
RSB-70-E-1	1	11/3/2021	<3.1	**3.6**	**210**	<0.52	**1.5**	**370**	**11**	**120**	**91**	**0.16**	**8.3**	**46**	<3.1	<0.52	<3.1	**73**	**510**
RSB-70-E-3	3	11/3/2021	<2.9	**1.9**	**150**	<0.48	<0.48	**46**	**9.9**	**30**	**13**	<0.15	**1.5**	**19**	<2.9	<0.48	<2.9	**52**	**99**
RSB-70-E-5	5	11/3/2021	<2.7	**1.1**	**110**	<0.44	<0.44	**17**	**7.3**	**13**	**4.4**	<0.16	<0.88	**11**	<2.7	<0.44	<2.7	**40**	**49**
SB-1-1	1	11/4/2021	**2.8**	**6.1**	**82**	<0.43	<0.43	**110**	**13**	**160**	**33**	<0.16	**11**	**83**	<2.6	<0.43	<2.6	**44**	**180**
SB-1-3	3	11/4/2021	<2.9	**1.3**	**130**	<0.48	<0.48	**29**	**8.1**	**16**	**4.2**	<0.14	<0.96	**13**	<2.9	<0.48	<2.9	**46**	**53**
SB-2-1	1	11/4/2021	**4.8**	**3.9**	**310**	**0.77**	<0.52	**640**	**13**	**280**	**69**	<0.15	**22**	**110**	**4.1**	<0.52	<3.1	**140**	**390**

Table 2
Soil Analytical Results - Metals
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Analytical Method			**USEPA Method 6010B/7141A**																
Unit			**mg/kg**																
DTSC Commercial/Industrial Soil SL			**NS**	**0.36**	**NS**	**230**	**79**	**NS**	**NS**	**NS**	**500**	**4.4**	**NS**	**11,000**	**NS**	**NS**	**NS**	**NS**	**NS**
USEPA Industrial Soil RSL			**470**	**3**	**220,000**	**2,300**	**100**	**NS**	**350**	**47,000**	**800**	**46**	**5,800**	**22,000**	**5,800**	**5,800**	**12**	**5,800**	**350,000**
California Upper Confidence Limit [1]			**NS**	**12**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
SB-2-3	3	11/4/2021	**2.8**	**4.3**	**180**	<0.45	**2.6**	**190**	**11**	**190**	**320**	**0.25**	**8.7**	**50**	<2.7	<0.45	<2.7	**59**	**730**
SB-3-1	1	11/4/2021	<2.8	**2.6**	**240**	**0.49**	<0.47	**310**	**9.3**	**100**	**41**	<0.16	**7.2**	**43**	<2.8	<0.47	<2.8	**100**	**380**
SB-3-3	3	11/4/2021	<2.8	**2.8**	**150**	<0.46	<0.46	**100**	**10**	**110**	**61**	<0.14	**5.7**	**43**	<2.8	<0.46	<2.8	**55**	**250**
RR-1-.5	0.5	11/8/2021	<2.8	**3.2**	**340**	**2.40**	<0.46	**170**	**5.9**	**130**	**24**	<0.16	**9.4**	**48**	<2.8	**0.53**	<2.8	**53**	**180**
RR-1-1.5	1.5	11/8/2021	<2.8	**3.3**	**270**	**1.70**	<0.47	**190**	**6.7**	**120**	**21**	<0.15	**9.0**	**46**	<2.8	**0.61**	<2.8	**66**	**170**
RR-2-.5	0.5	11/8/2021	<2.8	**4.9**	**160**	**0.83**	**1.2**	**85**	**9.1**	**92**	**54**	<0.14	**7.9**	**48**	<2.8	<0.47	<2.8	**43**	**310**
RR-2-1.5	1.5	11/8/2021	<2.9	**3.9**	**130**	**0.59**	<0.49	**62**	**11**	**91**	**33**	<0.15	**6.8**	**42**	<2.9	<0.49	<2.9	**44**	**190**
RR-3-.5	0.5	11/8/2021	**8.8**	**12**	**310**	**0.62**	**13**	**1,100**	**24**	**530**	**330**	<0.16	**37**	**180**	**4.3**	**0.98**	**2.9**	**120**	**1,900**
RR-3-1.5	1.5	11/8/2021	**5.7**	**8.9**	**250**	**0.77**	**5.8**	**420**	**20**	**320**	**290**	**0.16**	**20**	**87**	<2.9	<0.49	<2.9	**49**	**1,200**
RR-4-.5	0.5	11/8/2021	**5.7**	**8.7**	**340**	**0.56**	**3.0**	**600**	**17**	**300**	**190**	**0.15**	**20**	**95**	**4.1**	**0.70**	<3.0	**99**	**1,000**
RR-4-1.5	1.5	11/8/2021	<2.8	**1.8**	**130**	<0.47	<0.47	**110**	**7.4**	**35**	**19**	<0.14	**2.1**	**16**	<2.8	<0.47	<2.8	**48**	**130**
RR-5-.5	0.5	11/8/2021	**5.3**	**5.7**	**190**	**0.53**	**1.2**	**500**	**14**	**300**	**110**	<0.16	**20**	**79**	**5.8**	**0.81**	<2.8	**110**	**450**
RR-5-1.5	1.5	11/8/2021	**5.4**	**8.2**	**240**	**0.50**	**3.5**	**500**	**21**	**440**	**170**	<0.17	**24**	**120**	**3.4**	**0.65**	<2.8	**110**	**840**
RR-6-.5	0.5	11/8/2021	**3.9**	**4.5**	**240**	<0.47	**0.55**	**430**	**11**	**210**	**67**	<0.16	**13**	**68**	**3.1**	<0.47	<2.8	**96**	**470**
RR-6-1.5	1.5	11/8/2021	<3.1	**1.2**	**110**	<0.52	<0.52	**48**	**7.0**	**24**	**9.0**	<0.14	**1.1**	**14**	<3.1	<0.52	<3.1	**46**	**70**
RR-7-.5	0.5	11/8/2021	<2.8	**5.9**	**170**	<0.47	**1.9**	**250**	**14**	**230**	**160**	<0.15	**11**	**63**	<2.8	<0.47	<2.8	**61**	**570**
RR-7-1.5	1.5	11/8/2021	<3.1	**6.0**	**140**	<0.52	**1.7**	**170**	**17**	**210**	**150**	<0.14	**10**	**74**	<3.1	<0.52	<3.1	**57**	**480**
RR-8-.5	0.5	11/8/2021	<3.3	**4.5**	**99**	<0.55	<0.55	**110**	**5.3**	**42**	**18**	<0.16	**3.1**	**20**	<3.3	<0.55	<3.3	**41**	**120**
RR-8-1.5	1.5	11/8/2021	<2.9	**3.9**	**77**	<0.48	<0.48	**69**	**4.5**	**25**	**13**	<0.17	**2.2**	**16**	<2.9	<0.48	<2.9	**63**	**79**
RR-9-.5	0.5	11/8/2021	**4.7**	**5.3**	**300**	**0.71**	**3.0**	**500**	**22**	**320**	**200**	**0.23**	**16**	**77**	**4.5**	**1.0**	<2.9	**210**	**870**
RR-9-1.5	1.5	11/8/2021	**3.3**	**4.9**	**210**	**0.51**	**4.4**	**350**	**23**	**290**	**220**	**0.39**	**11**	**61**	**4.1**	**0.79**	<2.6	**110**	**1,400**
RR-10-.5	0.5	11/8/2021	<3.1	**1.9**	**90**	<0.52	<0.52	**36**	**5.9**	**20**	**5.9**	<0.15	**2.2**	**16**	<3.1	<0.52	<3.1	**41**	**46**
RR-10-1.5	1.5	11/8/2021	<3.0	**1.7**	**120**	<0.50	<0.50	**15**	**7.1**	**12**	**4.0**	<0.16	<0.99	**9.3**	<3.0	<0.50	<3.0	**44**	**43**
RR-11-.5	0.5	11/8/2021	<2.8	**4.6**	**93**	<0.46	<0.46	**54**	**6.0**	**21**	**9.9**	<0.15	**1.3**	**14**	<2.8	<0.46	<2.8	**37**	**76**
RR-11-1.5	1.5	11/8/2021	<2.8	**3.9**	**73**	<0.47	<0.47	**34**	**3.7**	**15**	**9.0**	<0.15	**1.2**	**12**	<2.8	<0.47	<2.8	**23**	**64**
RR-12-.5	0.5	11/8/2021	**8.0**	**13**	**300**	**0.79**	<0.44	**710**	**18**	**450**	**67**	<0.16	**33**	**170**	**4.9**	**0.85**	<2.7	**150**	**560**
RR-12-1.5	1.5	11/8/2021	**9.7**	**14**	**250**	**0.65**	<0.50	**770**	**23**	**520**	**71**	<0.15	**39**	**250**	**4.0**	<0.50	**3.1**	**120**	**370**
RR-13-.5	0.5	11/8/2021	<2.8	**2.5**	**280**	**2.5**	<0.46	**19**	**4.9**	**15**	**6.5**	<0.16	<0.93	**8.2**	<2.8	<0.46	<2.8	**33**	**83**
RR-13-1.5	1.5	11/8/2021	<2.9	**1.5**	**120**	**0.61**	<0.48	**15**	**6.6**	**12**	**3.9**	<0.16	<0.95	**10**	<2.9	<0.48	<2.9	**41**	**46**
RR-14-.5	0.5	11/8/2021	<2.9	**15**	**50**	<0.48	<0.48	**28**	**5.4**	**18**	**18**	<0.14	**1.2**	**17**	<2.9	<0.48	<2.9	**28**	**76**
RR-14-1.5	1.5	11/8/2021	<3.0	**11**	**95**	<0.51	**0.60**	**38**	**7.5**	**44**	**35**	<0.16	**2.7**	**20**	<3.0	<0.51	<3.0	**31**	**150**
RR-15-.5	0.5	11/8/2021	<2.7	**1.4**	**130**	<0.45	<0.45	**19**	**8.2**	**16**	**4.7**	<0.14	<0.90	**13**	<2.7	<0.45	<2.7	**46**	**53**
RR-15-1.5	1.5	11/8/2021	<2.8	**1.1**	**150**	<0.47	<0.47	**23**	**9.1**	**19**	**6.8**	<0.16	<0.94	**17**	<2.8	<0.47	<2.8	**49**	**60**

Table 2
Soil Analytical Results - Metals
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Analytical Method			**USEPA Method 6010B/7141A**																
Unit			**mg/kg**																
DTSC Commercial/Industrial Soil SL			**NS**	**0.36**	**NS**	**230**	**79**	**NS**	**NS**	**NS**	**500**	**4.4**	**NS**	**11,000**	**NS**	**NS**	**NS**	**NS**	**NS**
USEPA Industrial Soil RSL			**470**	**3**	**220,000**	**2,300**	**100**	**NS**	**350**	**47,000**	**800**	**46**	**5,800**	**22,000**	**5,800**	**5,800**	**12**	**5,800**	**350,000**
California Upper Confidence Limit [1]			**NS**	**12**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
RR-16-.5	0.5	11/8/2021	<3.0	<1.0	**100**	<0.51	<0.51	**13**	**5.7**	**10**	**3.9**	<0.14	<1.00	**8.5**	<3.0	<0.51	<3.0	**38**	**36**
RR-16-1.5	1.5	11/8/2021	<2.8	**1.6**	**110**	<0.46	<0.46	**17**	**7.3**	**13**	**5.2**	<0.17	<0.92	**11**	<2.8	<0.46	<2.8	**45**	**45**
RR-17-.5	0.5	11/8/2021	<3.1	**2.4**	**290**	**2.2**	**1.1**	**190**	**4.2**	**53**	**52**	<0.16	**2.9**	**18**	<3.1	<0.52	<3.1	**48**	**290**
RR-17-1.5	1.5	11/8/2021	<3.1	**2.5**	**300**	**2.1**	<0.52	**200**	**6.5**	**110**	**37**	<0.16	**7.0**	**39**	<3.1	<0.52	<3.1	**68**	**250**
RR-18-.5	0.5	11/8/2021	<3.0	**1.2**	**120**	<0.51	<0.51	**17**	**6.9**	**14**	**5.9**	<0.15	<1.00	**11**	<3.0	<0.51	<3.0	**42**	**52**
RR-18-1.5	1.5	11/8/2021	<2.9	**1.0**	**110**	<0.48	<0.48	**17**	**6.3**	**12**	**4.6**	<0.15	<0.96	**11**	<2.9	<0.48	<2.9	**40**	**44**
RR-19-.5	0.5	11/8/2021	**6.2**	**7.1**	**530**	**0.78**	**5.50**	**830**	**11**	**330**	**210**	<0.14	**24**	**92**	**8.7**	**1.8**	**3.4**	**150**	**1,500**
RR-19-1.5	1.5	11/8/2021	**3.5**	**5.3**	**350**	**0.94**	**3.70**	**540**	**7.9**	**190**	**140**	<0.16	**13**	**55**	**4.8**	**1.0**	<2.9	**100**	**970**

Notes:
ft bgs = feet below ground surface
USEPA = United States Environmental Protection Agency
mg/kg = milligrams per kilogram

DTSC Commercial/Industrial Soil SL = California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 3 Screening Level for Commercial/Industrial Soil (June 2020)

USEPA Commercial/Industrial Soil RSL = USEPA Regional Screening Level for Commercial/Industrial Soil (May 2022)
[1]California Upper Confidence Limit = background arsenic concentration of 12.0 mg/kg; DTSC HERO HHRA Note 11 (December 2020)
NS = no standard established
Shading indicates sample collected by Ramboll
Bold indicates that value exceeds laboratory reporting limit
Italics indicate sample is a duplicate
<X = analyte not detected above laboratory reporting limit
Cells highlighted in orange exceed either one or both SLs
Lowest of the cancer and non-cancer endpoint screening levels are listed

Table 3
Soil Analytical Results - Volatile Organic Compounds (VOCs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	1,2,4-Trimethylbenzene	Acetone	Benzene	Ethylbenzene	m,p-Xylenes	Methylene Chloride	Naphthalene	o-Xylene	tert-Butyl Alcohol (TBA)	Tetrachloroethene	Toluene	Trichloroethene	Other Analyzed VOCs
Analytical Method			**USEPA Method 8260B**												
Unit			**µg/kg**												
DTSC Commercial/Industrial Soil SL			**NS**	**NS**	**1,400**	**NS**	**NS**	**26,000**	**6,500**	**NS**	**NS**	**2,700**	**5,300,000**	**NS**	**varies**
USEPA Industrial Soil RSL			**1,800,000**	**1,100,000,000**	**5,100**	**25,000**	**2,400,000**	**1,000,000**	**8,600**	**2,800,000**	**6,500,000**	**100,000**	**47,000,000**	**6,000**	**varies**
RSB-28-1	1	12/21/2020	<1.0	NA	**4.1**	<1.0	<2.5	<1.0	<1.0	<1.0	<50	<1.0	**2.5**	<1.0	ND
RSB-28-3	3	12/21/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-28-5	5	12/21/2020	<1.0	NA	<1.0	**1.9**	**5.6**	<1.0	<1.0	**1.7**	<50	<1.0	<1.0	<1.0	ND
RSB-28-10	10	12/21/2020	**2.8**	NA	**3.3**	<1.0	**3.0**	<1.0	<1.0	**1.5**	<50	<1.0	**2.9**	<1.0	ND
RSB-28-15	15	12/21/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-28-20	20	12/21/2020	**1.3**	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-28-25	25	12/21/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.1**	<1.0	ND
RSB-28-30	30	12/21/2020	**1.3**	NA	**1.2**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.3**	<1.0	ND
RSB-28-R4-5	5	3/2/2022	<7.6	<150	<7.6	<7.6	<15	<7.6	<7.6	<7.6	<15	<7.6	<7.6	<7.6	ND
RSB-28-R4-15	15	3/2/2022	<5.0	<100	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	ND
RSB-28-R5-5	5	3/3/2022	<4.2	<85	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	ND
RSB-28-R5-15	15	3/3/2022	<3.8	<76	<3.8	<3.8	<7.6	<3.8	<3.8	<3.8	<7.6	<3.8	<3.8	<3.8	ND
RSB-28-R6-5	5	3/2/2022	<4.5	<89	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	ND
RSB-28-R6-15	15	3/2/2022	<4.5	<89	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	ND
RSB-28-R7-5	5	3/2/2022	<4.2	<83	<4.2	<4.2	<8.3	<4.2	<4.2	<4.2	<8.3	<4.2	<4.2	<4.2	ND
RSB-28-R7-15	15	3/2/2022	<13	<260	<13	<13	<26	<13	<13	<13	<26	<13	<13	<13	ND
RSB-28-R8-15	15	3/2/2022	<5.3	<110	<5.3	<5.3	<11	<5.3	<5.3	<5.3	<11	<5.3	<5.3	<5.3	ND
RSB-29-1	1	12/21/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**2.1**	<1.0	ND
RSB-29-3	3	12/21/2020	<1.0	NA	**2.1**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.2**	<1.0	ND
RSB-29-5	5	12/21/2020	<1.0	NA	**1.5**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-29-10	10	12/21/2020	<1.0	NA	<1.0	<1.0	**2.1**	<1.0	<1.0	**2.3**	<50	<1.0	<1.0	<1.0	ND
RSB-29-15	15	12/21/2020	<1.0	NA	**2.1**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.5**	<1.0	ND
RSB-29-20	20	12/21/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-29-25	25	12/21/2020	**2.1**	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-29-30	30	12/21/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-29-R4-5	5	3/2/2022	<4.6	<93	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	ND
RSB-29-R4-15	15	3/2/2022	<3.8	<77	<3.8	<3.8	<7.7	<3.8	<3.8	<3.8	<7.7	<3.8	<3.8	<3.8	ND
RSB-29-R5-5	5	3/2/2022	<3.7	<74	<3.7	<3.7	<7.4	<3.7	<3.7	<3.7	<7.4	<3.7	<3.7	<3.7	ND
RSB-29-R5-15	15	3/2/2022	<4.5	<91	<4.5	<4.5	<9.1	<4.5	<4.5	<4.5	<9.1	<4.5	<4.5	<4.5	ND
RSB-29-R6-5	5	3/3/2022	<4.4	<88	<4.4	<4.4	<8.8	<4.4	<4.4	<4.4	<8.8	<4.4	<4.4	<4.4	ND
RSB-29-R6-15	15	3/3/2022	<4.2	<85	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	ND
RSB-29-R7-5	5	3/2/2022	<6.4	<130	<6.4	<6.4	<13	<6.4	<6.4	<6.4	<13	<6.4	<6.4	<6.4	ND
RSB-29-R7-15	15	3/2/2022	<4.9	<98	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	ND

Table 3
Soil Analytical Results - Volatile Organic Compounds (VOCs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	1,2,4-Trimethylbenzene	Acetone	Benzene	Ethylbenzene	m,p-Xylenes	Methylene Chloride	Naphthalene	o-Xylene	tert-Butyl Alcohol (TBA)	Tetrachloroethene	Toluene	Trichloroethene	Other Analyzed VOCs
Analytical Method			USEPA Method 8260B												
Unit			µg/kg												
DTSC Commercial/Industrial Soil SL			NS	NS	1,400	NS	NS	26,000	6,500	NS	NS	2,700	5,300,000	NS	varies
USEPA Industrial Soil RSL			1,800,000	1,100,000,000	5,100	25,000	2,400,000	1,000,000	8,600	2,800,000	6,500,000	100,000	47,000,000	6,000	varies
RSB-29-R8-15	15	3/2/2022	<4.6	<93	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	ND
RSB-29-R9-15	15	3/2/2022	<4.2	<85	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	ND
RSB-30-1	1	12/21/2020	<1.0	NA	**2.7**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.6**	<1.0	ND
RSB-30-3	3	12/21/2020	<1.0	NA	**1.0**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-30-5	5	12/21/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-30-10	10	12/21/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-30-15	15	12/21/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-30-R4-5	5	3/4/2022	<6.0	<120	<6.0	<6.0	<12	<6.0	<6.0	<6.0	**14**	<6.0	<6.0	<6.0	ND
RSB-30-R4-15	15	3/4/2022	<4.6	<93	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	ND
RSB-30-R5-5	5	3/4/2022	<5.0	<100	<5.0	<5.0	<10	<5.0	<5.0	<5.0	<10	<5.0	<5.0	<5.0	ND
RSB-30-R5-15	15	3/4/2022	<6.9	<140	<6.9	<6.9	<14	<6.9	<6.9	<6.9	<14	<6.9	<6.9	<6.9	ND
RSB-30-R6-35	35	3/4/2022	<4.9	<98	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	ND
RSB-38-1	1	12/29/2020	<1.0	NA	**1.5**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.3**	<1.0	ND
RSB-38-3	3	12/29/2020	<1.0	NA	**1.6**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.2**	<1.0	ND
RSB-38-5	5	12/29/2020	<1.0	NA	**1.0**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-38-R4-5	5	3/4/2022	<6.8	<140	<6.8	<6.8	<14	<6.8	<6.8	<6.8	<14	<6.8	<6.8	<6.8	ND
RSB-38-R4-15	15	3/4/2022	<6.4	<130	<6.4	<6.4	<13	<6.4	<6.4	<6.4	<13	<6.4	<6.4	<6.4	ND
RSB-38-R5-5	5	3/4/2022	<4.2	<83	<4.2	<4.2	<8.3	<4.2	<4.2	<4.2	**8.6**	<4.2	<4.2	<4.2	ND
RSB-38-R5-15	15	3/4/2022	<5.6	<110	<5.6	<5.6	<11	<5.6	<5.6	<5.6	**14**	<5.6	<5.6	<5.6	ND
RSB-38-R6-5	5	3/3/2022	<5.3	<110	<5.3	<5.3	<11	<5.3	<5.3	<5.3	<11	<5.3	<5.3	<5.3	ND
RSB-38-R6-15	15	3/3/2022	<4.6	<93	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	ND
RSB-38-R7-35	35	3/3/2022	<4.2	<83	<4.2	<4.2	<8.3	<4.2	<4.2	<4.2	<8.3	<4.2	<4.2	<4.2	ND
RSB-53-1	1	12/30/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-53-3	3	12/30/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-53-5	5	12/30/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-53-R8-5	5	3/3/2022	<4.5	<89	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	ND
RSB-53-R8-15	15	3/3/2022	<4.3	<86	<4.3	<4.3	<8.6	<4.3	<4.3	<4.3	<8.6	<4.3	<4.3	<4.3	ND
RSB-53-R9-5	5	3/2/2022	<6.4	<130	<6.4	<6.4	<13	<6.4	<6.4	<6.4	<13	<6.4	<6.4	<6.4	ND
RSB-53-R9-15	15	3/2/2022	<6.3	<130	<6.3	<6.3	<13	<6.3	<6.3	<6.3	**13**	<6.3	<6.3	<6.3	ND
RSB-53-R10-5	5	3/3/2022	<5.7	<110	<5.7	<5.7	<11	<5.7	<5.7	<5.7	**13**	<5.7	<5.7	<5.7	ND
RSB-53-R10-15	15	3/3/2022	<5.4	<110	<5.4	<5.4	<11	<5.4	<5.4	<5.4	<11	<5.4	<5.4	<5.4	ND
RSB-53-R11-5	5	3/3/2022	<4.8	<96	<4.8	<4.8	<9.6	<4.8	<4.8	<4.8	<9.6	<4.8	<4.8	<4.8	ND
RSB-53-R11-15	15	3/3/2022	<4.9	<98	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	ND

Table 3
Soil Analytical Results - Volatile Organic Compounds (VOCs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	1,2,4-Trimethylbenzene	Acetone	Benzene	Ethylbenzene	m,p-Xylenes	Methylene Chloride	Naphthalene	o-Xylene	tert-Butyl Alcohol (TBA)	Tetrachloroethene	Toluene	Trichloroethene	Other Analyzed VOCs
Analytical Method			**USEPA Method 8260B**												
Unit			**µg/kg**												
DTSC Commercial/Industrial Soil SL			**NS**	**NS**	**1,400**	**NS**	**NS**	**26,000**	**6,500**	**NS**	**NS**	**2,700**	**5,300,000**	**NS**	**varies**
USEPA Industrial Soil RSL			**1,800,000**	**1,100,000,000**	**5,100**	**25,000**	**2,400,000**	**1,000,000**	**8,600**	**2,800,000**	**6,500,000**	**100,000**	**47,000,000**	**6,000**	**varies**
RSB-53-R12-15	15	3/3/2022	<4.8	<96	<4.8	<4.8	<9.6	<4.8	<4.8	<4.8	<9.6	<4.8	<4.8	<4.8	ND
RSB-53-R13-15	15	3/3/2022	<5.1	<100	<5.1	<5.1	<10	<5.1	<5.1	<5.1	<10	<5.1	<5.1	<5.1	ND
RSB-53-R14-35	35	3/3/2022	<4.9	<98	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	ND
RSB-53-R15-15	15	3/3/2022	<5.1	<100	<5.1	<5.1	<10	<5.1	<5.1	<5.1	<10	<5.1	<5.1	<5.1	ND
RSB-53-R15-35	35	3/3/2022	<4.2	<83	<4.2	<4.2	<8.3	<4.2	<4.2	<4.2	<8.3	<4.2	<4.2	<4.2	ND
RSB-54-1	1	12/30/2020	<1.0	NA	**2.3**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	**53.8**	**1.0**	<1.0	ND
RSB-54-3	3	12/30/2020	<1.0	NA	**1.4**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-54-5	5	12/30/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	**29.3**	<1.0	<1.0	ND
RSB-54-E3-35	35	3/3/2022	<5.0	<100	<5.0	<5.0	<10	<5.0	<5.0	<5.0	**23**	<5.0	<5.0	<5.0	ND
RSB-54-E4-5	5	3/3/2022	<5.6	<110	<5.6	<5.6	<11	<5.6	<5.6	<5.6	**13**	<5.6	<5.6	<5.6	ND
RSB-54-E4-15	15	3/3/2022	<4.4	<88	<4.4	<4.4	<8.8	<4.4	<4.4	<4.4	<8.8	<4.4	<4.4	<4.4	ND
RSB-54-E4-35	35	3/3/2022	<4.5	<89	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	ND
RSB-54-NE-5	5	3/3/2022	<5.4	<110	<5.4	<5.4	<11	<5.4	<5.4	<5.4	<11	<5.4	<5.4	<5.4	ND
RSB-54-NE-15	15	3/3/2022	<4.0	<81	<4.0	<4.0	<8.1	<4.0	<4.0	<4.0	<8.1	<4.0	<4.0	<4.0	ND
RSB-54-NE-35	35	3/3/2022	<5.4	<110	<5.4	<5.4	<11	<5.4	<5.4	<5.4	<11	<5.4	<5.4	<5.4	ND
RSB-54-S2-5	5	3/3/2022	<7.6	<150	<7.6	<7.6	<15	<7.6	<7.6	<7.6	<15	<7.6	<7.6	<7.6	ND
RSB-54-S2-15	15	3/3/2022	<4.1	<82	<4.1	<4.1	<8.2	<4.1	<4.1	<4.1	<8.2	<4.1	<4.1	<4.1	ND
RSB-54-S2-35	35	3/3/2022	<4.2	<85	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	ND
RSB-54-SE-5	5	3/3/2022	<6.1	<120	<6.1	<6.1	<12	<6.1	<6.1	<6.1	**17**	<6.1	<6.1	<6.1	ND
RSB-54-SE-15	15	3/3/2022	<4.5	<89	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	<8.9	<4.5	<4.5	<4.5	ND
RSB-54-SE-35	35	3/3/2022	<4.8	<96	<4.8	<4.8	<9.6	<4.8	<4.8	<4.8	<9.6	<4.8	<4.8	<4.8	ND
RSB-58-1	1	12/16/2020	<1.0	NA	**1.6**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.8**	<1.0	ND
RSB-58-3	3	12/16/2020	<1.0	NA	**1.0**	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.1**	<1.0	ND
RSB-58-5	5	12/16/2020	<1.0	NA	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<50	<1.0	**1.2**	<1.0	ND
RSB-58-S-1	1	11/3/2021	<4.5	<91	<4.5	<4.5	<9.1	<4.5	<4.5	<4.5	<9.1	<4.5	<4.5	<4.5	ND
RSB-58-S-3	3	11/3/2021	<4.2	<85	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	<8.5	<4.2	<4.2	<4.2	ND
RSB-58-S-5	5	11/3/2021	<5.2	<100	<5.2	<5.2	<10	<5.2	<5.2	<5.2	<10	<5.2	<5.2	<5.2	ND
RSB-58-W-1	1	11/3/2021	<4.1	<82	<4.1	<4.1	<8.2	<4.1	<4.1	<4.1	<8.2	<4.1	<4.1	<4.1	ND
RSB-58-W-3	3	11/3/2021	<4.5	<91	<4.5	<4.5	<9.1	<4.5	<4.5	<4.5	<9.1	<4.5	<4.5	<4.5	ND
RSB-58-W-5	5	11/3/2021	<5.3	<110	<5.3	<5.3	<11	<5.3	<5.3	<5.3	<11	<5.3	<5.3	<5.3	ND
RSB-60-1	1	12/28/2020	<1.0	NA	**4.9**	**1.1**	<2	<1.0	<1.0	<1.0	<50	<1.0	**2.6**	<1.0	ND
RSB-60-3	3	12/28/2020	<1.0	NA	<1.0	<1.0	<2	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND
RSB-60-5	5	12/28/2020	<1.0	NA	**1.2**	<1.0	<2	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<1.0	ND

Table 3
Soil Analytical Results - Volatile Organic Compounds (VOCs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	1,2,4-Trimethylbenzene	Acetone	Benzene	Ethylbenzene	m,p-Xylenes	Methylene Chloride	Naphthalene	o-Xylene	tert-Butyl Alcohol (TBA)	Tetrachloroethene	Toluene	Trichloroethene	Other Analyzed VOCs
Analytical Method			**USEPA Method 8260B**												
Unit			**µg/kg**												
DTSC Commercial/Industrial Soil SL			**NS**	**NS**	**1,400**	**NS**	**NS**	**26,000**	**6,500**	**NS**	**NS**	**2,700**	**5,300,000**	**NS**	**varies**
USEPA Industrial Soil RSL			**1,800,000**	**1,100,000,000**	**5,100**	**25,000**	**2,400,000**	**1,000,000**	**8,600**	**2,800,000**	**6,500,000**	**100,000**	**47,000,000**	**6,000**	**varies**
RSB-60-R5-5	5	3/4/2022	<4.7	<94	<4.7	<4.7	<9.4	<4.7	<4.7	<4.7	**19**	<4.7	<4.7	<4.7	ND
RSB-60-R5-15	15	3/4/2022	<3.9	<78	<3.9	<3.9	<7.8	<3.9	<3.9	<3.9	<7.8	<3.9	<3.9	<3.9	ND
RSB-60-R6-5	5	3/4/2022	<4.4	<88	<4.4	<4.4	<8.8	<4.4	<4.4	<4.4	<8.8	<4.4	<4.4	<4.4	ND
RSB-60-R6-15	15	3/4/2022	<4.6	<93	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	<9.3	<4.6	<4.6	<4.6	ND
RSB-60-R8-15	15	3/4/2022	<3.8	<77	<3.8	<3.8	<7.7	<3.8	<3.8	<3.8	**8.1**	<3.8	<3.8	<3.8	ND
RSB-60-R8-35	35	3/4/2022	<2.4	<48	<2.4	<2.4	<4.8	<2.4	<2.4	<2.4	<4.8	<2.4	<2.4	<2.4	ND
RSB-70-W-1	1	11/3/2021	<4.2	<83	<4.2	<4.2	<8.3	<4.2	<4.2	<4.2	<8	<4.2	<4.2	<4.2	ND
RSB-70-W-3	3	11/3/2021	<5.6	<110	<5.6	<5.6	<11.0	<5.6	<5.6	<5.6	<11.0	<5.6	<5.6	<5.6	ND
RSB-70-W-5	5	11/3/2021	<4.8	<96	<4.8	<4.8	<9.6	<4.8	<4.8	<4.8	<9.6	<4.8	<4.8	<4.8	ND
RSB-70-E-1	1	11/3/2021	<5.2	<100	<5.2	<5.2	<10.0	<5.2	<5.2	<5.2	<10.0	<5.2	<5.2	<5.2	ND
RSB-70-E-3	3	11/3/2021	<4.9	<98	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	ND
RSB-70-E-5	5	11/3/2021	<4.9	<98	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	ND
SB-1-1	1	11/4/2021	<5.1	<100	<5.1	<5.1	<10.0	<5.1	<5.1	<5.1	**13.0**	<5.1	<5.1	<5.1	ND
SB-1-3	3	11/4/2021	<6.0	<120	<6.0	<6.0	<12.0	<6.0	<6.0	<6.0	<12.0	<6.0	<6.0	<6.0	ND
SB-2-1	1	11/4/2021	<5.0	<100	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0	<5.0	ND
SB-2-3	3	11/4/2021	<13.0	<260	<13.0	<13.0	<26.0	<13.0	<13.0	<13.0	**28.0**	<13.0	<13.0	<13.0	ND
SB-3-1	1	11/4/2021	<5.4	<110	**6.2**	<5.4	<11.0	<5.4	<5.4	<5.4	<11.0	<5.4	<5.4	<5.4	ND
SB-3-3	3	11/4/2021	<5.4	<110	<5.4	<5.4	<11.0	<5.4	<5.4	<5.4	<11.0	<5.4	<5.4	<5.4	ND
RR-1-.5	0.5	11/8/2021	<4.2	<85	<4.2	<4.2	<8.5	<4.2	**5.0**	<4.2	<8.5	<4.2	<4.2	<4.2	ND
RR-1-1.5	1.5	11/8/2021	<5.3	<110	<5.3	<5.3	<11	<5.3	<5.3	<5.3	<11	<5.3	<5.3	<5.3	ND
RR-2-.5	0.5	11/8/2021	<6.6	<130	<6.6	<6.6	<13	<6.6	<6.6	<6.6	<13	<6.6	<6.6	<6.6	ND
RR-2-1.5	1.5	11/8/2021	<4.5	<91	<4.5	<4.5	<9	<4.5	<4.5	<4.5	<9.1	<4.5	<4.5	<4.5	ND
RR-3-.5	0.5	11/8/2021	<5.4	<110	<5.4	<5.4	<11	<5.4	<5.4	<5.4	<11	<5.4	<5.4	<5.4	ND
RR-3-1.5	1.5	11/8/2021	<5.6	<110	<5.6	<5.6	<11	<5.6	<5.6	<5.6	<11	<5.6	<5.6	<5.6	ND
RR-4-.5	0.5	11/8/2021	<4.5	<91	<4.5	<4.5	<9	<4.5	<4.5	<4.5	<9.1	<4.5	<4.5	<4.5	ND
RR-4-1.5	1.5	11/8/2021	<6.9	<140	<6.9	<6.9	<14	<6.9	<6.9	<6.9	**19**	<6.9	<6.9	<6.9	ND
RR-5-.5	0.5	11/8/2021	<14	<280	<14	<14	<28	<14	<14	<14	<28	<14	<14	<14	ND
RR-5-1.5	1.5	11/8/2021	<3.5	<70	<3.5	<3.5	<7	<3.5	<3.5	<3.5	<7.0	<3.5	<3.5	<3.5	ND
RR-6-.5	0.5	11/8/2021	<5.1	<100	<5.1	<5.1	<10	<5.1	**27**	<5.1	<10	<5.1	<5.1	<5.1	ND
RR-6-1.5	1.5	11/8/2021	<5.7	<110	<5.7	<5.7	<11	<5.7	<5.7	<5.7	<11	<5.7	<5.7	<5.7	ND
RR-7-.5	0.5	11/8/2021	<9.6	**220**	<9.6	<9.6	<19	<9.6	<9.6	<9.6	**44**	<9.6	<9.6	<9.6	ND
RR-7-1.5	1.5	11/8/2021	<6.3	**180**	<6.3	<6.3	<13	<6.3	<6.3	<6.3	**31**	<6.3	<6.3	<6.3	ND
RR-8-.5	0.5	11/8/2021	<5.7	**150**	<5.7	<5.7	<11	<5.7	**24**	<5.7	<11	<5.7	<5.7	<5.7	ND

Table 3
Soil Analytical Results - Volatile Organic Compounds (VOCs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	1,2,4-Trimethylbenzene	Acetone	Benzene	Ethylbenzene	m,p-Xylenes	Methylene Chloride	Naphthalene	o-Xylene	tert-Butyl Alcohol (TBA)	Tetrachloroethene	Toluene	Trichloroethene	Other Analyzed VOCs
Analytical Method			USEPA Method 8260B												
Unit			µg/kg												
DTSC Commercial/Industrial Soil SL			NS	NS	1,400	NS	NS	26,000	6,500	NS	NS	2,700	5,300,000	NS	varies
USEPA Industrial Soil RSL			1,800,000	1,100,000,000	5,100	25,000	2,400,000	1,000,000	8,600	2,800,000	6,500,000	100,000	47,000,000	6,000	varies
RR-8-1.5	1.5	11/8/2021	<8.1	**190**	<8.1	<8.1	<16	<8.1	**69**	<8.1	**24**	<8.1	<8.1	<8.1	ND
RR-9-.5	0.5	11/8/2021	<7.4	<150	<7.4	<7.4	<15	<7.4	**8.9**	<7.4	<15	<7.4	<7.4	<7.4	ND
RR-9-1.5	1.5	11/8/2021	<5.0	<100	<5.0	<5.0	<10	<5.0	<5.0	<5.0	**12**	<5.0	<5.0	<5.0	ND
RR-10-.5	0.5	11/8/2021	<5.3	<110	<5.3	<5.3	<11	<5.3	**7.4**	<5.3	**13**	<5.3	<5.3	<5.3	ND
RR-10-1.5	1.5	11/8/2021	<6.1	<120	<6.1	<6.1	<12	<6.1	<6.1	<6.1	<12	<6.1	<6.1	<6.1	ND
RR-11-.5	1	11/8/2021	<5.7	<110	<5.7	<5.7	<11	<5.7	<5.7	<5.7	<11	<5.7	<5.7	<5.7	ND
RR-11-1.5	1.5	11/8/2021	<5.4	<110	<5.4	<5.4	<11	<5.4	<5.4	<5.4	<11	<5.4	<5.4	<5.4	ND
RR-12-.5	0.5	11/8/2021	<6.4	**140**	<6.4	<6.4	<13	<6.4	**22**	<6.4	<13	<6.4	<6.4	<6.4	ND
RR-12-1.5	1.5	11/8/2021	<6.1	<120	<6.1	<6.1	<12	<6.1	**52**	<6.1	<12	<6.1	<6.1	<6.1	ND
RR-13-.5	0.5	11/8/2021	<7.1	<140	<7.1	<7.1	<14	<7.1	<7.1	<7.1	<14	<7.1	<7.1	<7.1	ND
RR-13-1.5	1.5	11/8/2021	<5.7	<110	<5.7	<5.7	<11	<5.7	<5.7	<5.7	<11	<5.7	<5.7	<5.7	ND
RR-14-.5	0.5	11/8/2021	<7.4	<150	<7.4	<7.4	<15	<7.4	**71**	<7.4	**22**	<7.4	<7.4	<7.4	ND
RR-14-1.5	1.5	11/8/2021	<6.4	<130	<6.4	<6.4	<13	<6.4	**57**	<6.4	**25**	<6.4	<6.4	<6.4	ND
RR-15-.5	0.5	11/8/2021	<5.4	<110	<5.4	<5.4	<11	<5.4	<5.4	<5.4	<11	<5.4	<5.4	<5.4	ND
RR-15-1.5	1.5	11/8/2021	<5.8	<120	<5.8	<5.8	<12	<5.8	<5.8	<5.8	**14**	<5.8	<5.8	<5.8	ND
RR-16-.5	0.5	11/8/2021	<5.2	<100	<5.2	<5.2	<10	<5.2	<5.2	<5.2	<10	<5.2	<5.2	<5.2	ND
RR-16-1.5	1.5	11/8/2021	<5.4	<110	<5.4	<5.4	<11	<5.4	<5.4	<5.4	<11	<5.4	<5.4	<5.4	ND
RR-17-.5	0.5	11/8/2021	<16	<310	<16	<16	<31	<16	<16	<16	<31	<16	<16	<16	ND
RR-17-1.5	1.5	11/8/2021	<4.9	<98	<4.9	<4.9	<9.8	<4.9	<4.9	<4.9	**10**	<4.9	<4.9	<4.9	ND
RR-18-.5	0.5	11/8/2021	<5.6	<110	<5.6	<5.6	<11	<5.6	<5.6	<5.6	**12**	<5.6	<5.6	<5.6	ND
RR-18-1.5	1.5	11/8/2021	<5.0	**400**	<5.0	<5.0	<10	**1,200**	<5.0	<5.0	<10	<5.0	<5.0	<5.0	ND
RR-19-.5	0.5	11/8/2021	<6.1	<120	<6.1	<6.1	<12	<6.1	<6.1	<6.1	<12	<6.1	<6.1	<6.1	ND
RR-19-1.5	1.5	11/8/2021	<6.9	<140	<6.9	<6.9	<14	<6.9	<6.9	<6.9	**14**	<6.9	<6.9	<6.9	ND

Notes:
ft bgs = feet below ground surface
Shading indicates data collected by Ramboll
µg/kg = micrograms per kilogram
USEPA = United States Environmental Protection Agency
USEPA Industrial Soil RSL = USEPA Regional Screening Level for Industrial Soil (May 2022)
DTSC Commercial/Industrial Soil SL = California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 3 Screening Level for Commercial/Industrial Soil (June 2020)
NS = No standard established
NA = Not Analyzed
ND = Not detected above laboratory reporting limits
Bold indicates that value exceeds laboratory reporting limit
<X = analyte not detected above laboratory reporting limit
Lowest of the cancer and non-cancer endpoint screening levels are listed

Table 4
Soil Analytical Results - Total Petroleum Hydrocarbons (TPH)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	GRO C6-C10	DRO C10-C28	ORO C28-C44
		Analytical Method	USEPA Method 8015B		
		Unit	mg/kg		
		DTSC Note 3 Commercia/Industrial SLs	NS	500	18,000
RSB-03-1	1	1/7/2021	<0.2	**9,230**	**11,000**
RSB-03-3	3	1/7/2021	<0.2	<10	<10
RSB-03-5	5	1/7/2021	<0.2	<10	<10
RSB-03-N-1	1	1/26/2021	<0.2	**48.8**	**348**
RSB-03-N-3	3	1/26/2021	<0.2	**138**	**4,140**
RSB-03-W-1	1	1/26/2021	<0.2	**113**	**141**
RSB-03-W-3	3	1/26/2021	<0.2	<1.0	<1.0
RSB-03-E-1	1	1/26/2021	<0.2	**2,520**	**4,920**
RSB-03-E-3	3	1/26/2021	<0.2	<1.0	<1.0
RSB-03-S-1	1	1/27/2021	<0.2	**811**	**1,110**
RSB-03-S-3	3	1/27/2021	<0.2	<1.0	<1.0
RSB-3-R1-1	1	11/5/2021	<2.1	**5,700**	**4,900**
RSB-3-R1-3	3	11/5/2021	NA	**850**	NA
RSB-3-R2-1	1	11/5/2021	<2.9	**2,900**	**1,300**
RSB-3-R2-3	3	11/5/2021	NA	**650**	NA
RSB-3-R3-1	1	11/5/2021	<3.3	**650**	**440**
RSB-3-R3-3	3	11/5/2021	NA	**560**	NA
RSB-3-R4-1	1	11/5/2021	<2.6	**740**	**460**
RSB-3-R4-3	3	11/5/2021	NA	**660**	NA
RSB-3-R5-1	1	11/5/2021	<2.8	**4,500**	**3,700**
RSB-3-R5-3	3	11/5/2021	NA	**370**	NA
RSB-05-1	1	12/18/2020	<0.2	**2,210**	**1,810**
RSB-05-3	3	12/18/2020	<0.2	<1.0	<1.0
RSB-05-5	5	12/18/2020	<0.2	<1.0	<1.0
RSB-05-N-3	3	1/26/2021	<0.2	<1.0	<1.0
RSB-05-W-1	1	1/26/2021	<0.2	<1.0	<1.0
RSB-05-W-3	3	1/26/2021	<0.2	<1.0	<1.0
RSB-05-E-1	1	1/26/2021	<0.2	<1.0	<1.0
RSB-05-E-3	3	1/26/2021	<0.2	<1.0	<1.0
RSB-05-S-1	1	1/26/2021	<0.2	**672**	**607**
RSB-05-S-3	3	1/26/2021	<0.2	**6,000**	**7,310**
RSB-05-SCL-0.5	0.5	2/11/2021	NA	<10	NA
RSB-05-SCL-3	3	2/11/2021	NA	<10	NA
RSB-05-SCL-5	5	2/11/2021	NA	<10	NA
RSB-05-SCL-10	10	2/11/2021	NA	<10	NA

Table 4
Soil Analytical Results - Total Petroleum Hydrocarbons (TPH)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	GRO C6-C10	DRO C10-C28	ORO C28-C44
		Analytical Method	USEPA Method 8015B		
		Unit	mg/kg		
		DTSC Note 3 Commercia/Industrial SLs	NS	500	18,000
RSB-05-SSW-0.5	0.5	2/11/2021	NA	**1,800**	NA
RSB-05-SSW-3	3	2/11/2021	NA	<10	NA
RSB-05-SSW-5	5	2/11/2021	NA	<10	NA
RSB-05-SSW-10	10	2/11/2021	NA	<10	NA
RSB-05-SSE-0.5	0.5	2/11/2021	NA	**1,040**	NA
RSB-05-SSE-3	3	2/11/2021	NA	<10	NA
RSB-05-SSE-5	5	2/11/2021	NA	<10	NA
RSB-05-SSE-10	10	2/11/2021	NA	<10	NA
RSB-05-S2-0.5	0.5	2/11/2021	NA	**7,590**	NA
RSB-05-S2-3	3	2/11/2021	NA	<10	NA
RSB-05-S2-5	5	2/11/2021	NA	<10	NA
RSB-05-S2-10	10	2/11/2021	NA	<10	NA
RSB-05-R1-1	1	11/4/2021	<2.6	**2,300**	**850**
RSB-05-R1-3	3	11/4/2021	NA	<10	NA
RSB-05-R2-1	1	11/4/2021	<2.4	**2,200**	**1,300**
RSB-05-R2-3	3	11/4/2021	NA	**20**	NA
RSB-05-R3-1	1	11/4/2021	<3.0	**1,000**	**350**
RSB-05-R3-3	3	11/4/2021	NA	<10	NA
RSB-05-R4-1	1	11/4/2021	<3.2	**440**	<10
RSB-05-R5-5	5	11/4/2021	<2.9	<10	<10
RSB-05-R6-1	1	11/4/2021	<2.2	**3,100**	**2,200**
RSB-05-R7-1	1	11/4/2021	<2.5	**52**	**19**
RSB-58-1	1	12/16/2020	<0.2	<1.0	<1.0
RSB-58-3	3	12/16/2020	<0.2	<1.0	<1.0
RSB-58-6	5	12/16/2020	<0.2	<1.0	<1.0
RSB-58-S-1	1	11/3/2021	<2.7	**19**	**32**
RSB-58-S-3	3	11/3/2021	<2.8	<10	<10
RSB-58-S-5	5	11/3/2021	<3.2	<10	<10
RSB-58-W-1	1	11/3/2021	<2.1	**13**	**26**
RSB-58-W-3	3	11/3/2021	<2.7	<10	<10
RSB-58-W-5	5	11/3/2021	<2.9	<10	<10
RSB-70-W-1	1	11/3/2021	<3.7	**90**	**170**
RSB-70-W-3	3	11/3/2021	<2.9	<10	<10
RSB-70-W-5	5	11/3/2021	<2.8	<10	<10
RSB-70-E-1	1	11/3/2021	<3.0	**150**	**250**

Table 4
Soil Analytical Results - Total Petroleum Hydrocarbons (TPH)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	GRO C6-C10	DRO C10-C28	ORO C28-C44
		Analytical Method	USEPA Method 8015B		
		Unit	mg/kg		
		DTSC Note 3 Commercia/Industrial SLs	NS	500	18,000
RSB-70-E-3	3	11/3/2021	<3.0	**17**	**32**
RSB-70-E-5	5	11/3/2021	<2.8	<10	<10
SB-1-1	1	11/4/2021	<3.1	<200	**820**
SB-1-3	3	11/4/2021	<3.3	<10	<10
SB-2-1	1	11/4/2021	<2.8	**32**	**65**
SB-2-3	3	11/4/2021	<3.6	**37**	**34**
SB-3-1	1	11/4/2021	<4.5	**17**	**53**
SB-3-3	3	11/4/2021	<3.0	**110**	**200**
SB-4-1	1	11/5/2021	<2.6	**49**	**18**
SB-4-3	3	11/5/2021	<2.6	<10	<10
RR-1-.5	0.5	11/8/2021	<2.7	**170**	**520**
RR-1-1.5	1.5	11/8/2021	<3.2	**220**	**660**
RR-2-.5	0.5	11/8/2021	<2.8	**610**	**2,500**
RR-2-1.5	1.5	11/8/2021	<3.4	**370**	**1,200**
RR-3-.5	0.5	11/8/2021	<1.9	**1,000**	**930**
RR-3-1.5	1.5	11/8/2021	<2.8	**720**	**570**
RR-4-.5	0.5	11/8/2021	<3.3	**880**	**840**
RR-4-1.5	1.5	11/8/2021	<2.5	**45**	**41**
RR-5-.5	0.5	11/8/2021	<2.9	**1,700**	**1,000**
RR-5-1.5	1.5	11/8/2021	<2.8	**420**	**260**
RR-6-.5	0.5	11/8/2021	<2.7	**970**	**850**
RR-6-1.5	1.5	11/8/2021	<3.1	**58**	**54**
RR-7-.5	0.5	11/8/2021	<3.3	**130**	**250**
RR-7-1.5	1.5	11/8/2021	<3.9	**530**	**990**
RR-8-.5	0.5	11/8/2021	<3.3	**2,700**	**2,400**
RR-8-1.5	1.5	11/8/2021	<3.4	**420**	**260**
RR-9-.5	0.5	11/8/2021	<3.9	**1,300**	**3,200**
RR-9-1.5	1.5	11/8/2021	<2.9	**1,300**	**2,100**
RR-10-.5	0.5	11/8/2021	<3.3	**180**	**480**
RR-10-1.5	1.5	11/8/2021	<3.5	<10	<10
RR-11-.5	0.5	11/8/2021	<3.6	**340**	**330**
RR-11-1.5	1.5	11/8/2021	<4.7	**130**	**130**
RR-12-.5	0.5	11/8/2021	<3.1	**400**	**370**
RR-12-1.5	1.5	11/8/2021	<2.8	**300**	**260**
RR-13-.5	0.5	11/8/2021	<3.4	**15**	**25**

Table 4
Soil Analytical Results - Total Petroleum Hydrocarbons (TPH)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	GRO C6-C10	DRO C10-C28	ORO C28-C44
		Analytical Method	USEPA Method 8015B		
		Unit	mg/kg		
		DTSC Note 3 Commercia/Industrial SLs	NS	500	18,000
RR-13-1.5	1.5	11/8/2021	<4.3	<10	<10
RR-14-.5	0.5	11/8/2021	<4.9	**480**	**1,400**
RR-14-1.5	1.5	11/8/2021	<3.2	**760**	**2,200**
RR-15-.5	0.5	11/8/2021	<3.6	<10	<10
RR-15-1.5	1.5	11/8/2021	<3.6	<10	<10
RR-16-.5	0.5	11/8/2021	<3.1	<10	<10
RR-16-1.5	1.5	11/8/2021	<3.2	<10	<10
RR-17-.5	0.5	11/8/2021	<7.5	**190**	**130**
RR-17-1.5	1.5	11/8/2021	<3.7	**910**	**280**
RR-18-.5	0.5	11/8/2021	<3.2	<10	<10
RR-18-1.5	1.5	11/8/2021	<3.0	<10	<10
RR-19-.5	0.5	11/8/2021	<3.9	**36**	**53**
RR-19-1.5	1.5	11/8/2021	<3.6	**16**	**22**

Notes:
ft bgs = feet below ground surface
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
ORO = Oil Range Organics
SFBRWQCB = San Francisco Regional Water Quality Control Board
SFBRWQCB ESL = USEPA Regional Screening Level for Commercial/Industrial Soil (2019)
Bold indicates that value exceeds laboratory reporting limit
Italics indicate sample is a duplicate
<X = analyte not detected above laboratory reporting limit
NA = Not applicable
Shading indicates data collected by Ramboll
Cells highlighted in orange exceed the RSL

Table 5
Soil Analytical Results - Polychlorinated Biphenyls (PCBs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	Aroclor-1242	Aroclor-1260	Other Analyzed PCBs
		Analytical Method	USEPA Method 8082		
		Unit	mg/kg		
		USEPA Industrial Soil RSL	0.95	0.99	varies
		DTSC Commercial/Industrial Soil SL	0.58	0.60	varies
RR-1-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-1-1.5	1.5	11/8/2021	<0.050	<0.050	ND
RR-2-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-2-1.5	1.5	11/8/2021	<0.050	<0.050	ND
RR-3-.5	0.5	11/8/2021	**130**	<0.050	ND
RR-3-1.5	1.5	11/8/2021	**170**	<0.100	ND
RR-4-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-4-1.5	1.5	11/8/2021	<0.050	<0.050	ND
RR-7-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-7-1.5	1.5	11/8/2021	<0.050	**0.13**	ND
RR-9-.5	0.5	11/8/2021	<0.050	**0.22**	ND
RR-9-1.5	1.5	11/8/2021	<0.050	**0.32**	ND
RR-12-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-12-1.5	1.5	11/8/2021	<0.050	<0.050	ND
RR-13-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-13-1.5	1.5	11/8/2021	<0.050	<0.050	ND
RR-15-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-15-1.5	1.5	11/8/2021	<0.050	<0.050	ND
RR-17-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-17-1.5	1.5	11/8/2021	<0.050	<0.050	ND
RR-18-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-18-1.5	1.5	11/8/2021	<0.050	<0.050	ND
RR-19-.5	0.5	11/8/2021	<0.050	<0.050	ND
RR-19-1.5	1.5	11/8/2021	<0.050	<0.050	ND

Notes:

ft bgs = feet below ground surface

USEPA = United States Environmental Protection Agency

µg/kg = micrograms per kilogram

USEPA Industrial Soil RSL = USEPA Regional Screening Level for Industrial Soil (May 2021)

DTSC Commercial/Industrial Soil SL = California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 3 Screening Level for Commercial/Industrial Soil (June 2020)

Bold indicates that value exceeds laboratory reporting limit

<X = analyte not detected above laboratory reporting limit

Cells highlighted in orange exceed either one or both SLs

ND = Not detected above laboratory reporting limits

Table 6
Soil Analytical Results - Organochlorine Pesticides (OCPs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	Endrin Ketone	Other Analyzed OCPs
		Analytical Method	**USEPA Method 8081A**	
		Unit	**µg/kg**	
		USEPA Industrial Soil RSL	NS	NS
		DTSC Commercial/Industrial Soil SL	NS	NS
RR-1-.5	0.5	11/8/2021	<25	ND
RR-1-1.5	1.5	11/8/2021	<5.0	ND
RR-2-.5	0.5	11/8/2021	<50	ND
RR-2-1.5	1.5	11/8/2021	<50	ND
RR-3-.5	0.5	11/8/2021	<5.0	ND
RR-3-1.5	1.5	11/8/2021	<10	ND
RR-4-.5	0.5	11/8/2021	<10	ND
RR-4-1.5	1.5	11/8/2021	<5.0	ND
RR-7-.5	0.5	11/8/2021	**11**	ND
RR-7-1.5	1.5	11/8/2021	<10	ND
RR-9-.5	0.5	11/8/2021	<50	ND
RR-9-1.5	1.5	11/8/2021	<50	ND
RR-12-.5	0.5	11/8/2021	<5.0	ND
RR-12-1.5	1.5	11/8/2021	<5.0	ND
RR-13-.5	0.5	11/8/2021	<5.0	ND
RR-13-1.5	1.5	11/8/2021	<5.0	ND
RR-15-.5	0.5	11/8/2021	<5.0	ND
RR-15-1.5	1.5	11/8/2021	<5.0	ND
RR-17-.5	0.5	11/8/2021	<5.0	ND
RR-17-1.5	1.5	11/8/2021	<5.0	ND
RR-18-.5	0.5	11/8/2021	<5.0	ND
RR-18-1.5	1.5	11/8/2021	<5.0	ND
RR-19-.5	0.5	11/8/2021	<5.0	ND
RR-19-1.5	1.5	11/8/2021	<5.0	ND

Notes:
ft bgs = feet below ground surface
µg/kg = micrograms per kilogram
USEPA = United States Environmental Protection Agency
USEPA Industrial Soil RSL = USEPA Regional Screening Level for Commercial/Industrial Soil (May 2021)
DTSC Commercial/Industrial Soil SL = California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 3 Screening Level for Commercial/Industrial Soil (June 2020)
NS = No standard established
Bold indicates that value exceeds laboratory reporting limit
ND = Not detected above laboratory reporting limits
<X = analyte not detected above laboratory reporting limit

Table 7
Soil Analytical Results - Semi-Volatile Organic Compounds (SVOCs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	1-Methylnaphthalene	2-Methylnaphthalene	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carbazole	Chrysene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Other Analyzed SVOCs
Analytical Method			USEPA Method 8270C																		
Unit			µg/kg																		
USEPA Industrial Soil RSL			**73,000**	**3,000,000**	**45,000,000**	**230,000,000**	**21,000**	**2,100**	**21,000**	**NS**	**210,000**	**NS**	**2,100,000**	**1,200,000**	**30,000,000**	**30,000,000**	**21,000**	**8,600**	**NS**	**23,000,000**	varies
DTSC Commercial/Industrial Soil SL			**30,000**	**1,300,000**	**23,000,000**	**130,000,000**	**12,000**	**1,300**	**13,000**	**NS**	**130,000**	**NS**	**1,300,000**	**650,000**	**18,000,000**	**17,000,000**	**13,000**	**6,500**	**NS**	**13,000,000**	varies
RR-1-.5	0.5	11/8/2021	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	<10,000	**5.0**	<10,000	<10,000	ND
RR-1-1.5	1.5	11/8/2021	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<5.3	<25,000	<25,000	ND
RR-2-.5	0.5	11/8/2021	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<50,000	<6.6	<50,000	<50,000	ND
RR-2-1.5	1.5	11/8/2021	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<4.5	<25,000	<25,000	ND
RR-3-.5	0.5	11/8/2021	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<5.4	<500	<500	ND
RR-3-1.5	1.5	11/8/2021	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	**1,700**	<5,000	<5,000	<5.6	<5,000	**1,500**	ND
RR-4-.5	0.5	11/8/2021	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<4.5	<5,000	<5,000	ND
RR-4-1.5	1.5	11/8/2021	<250	<250	<250	<250	**42**	<250	<250	**58**	<250	<250	**55**	<250	**140**	<250	<250	<6.9	<250	**160**	ND
RR-7-.5	0.5	11/8/2021	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	**1,500**	<5,000	<5,000	<9.6	<5,000	**1,400**	ND
RR-7-1.5	1.5	11/8/2021	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<20,000	<6.3	<20,000	<20,000	ND
RR-9-.5	0.5	11/8/2021	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	**8.9**	<25,000	<25,000	ND
RR-9-1.5	1.5	11/8/2021	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<5.0	<25,000	<25,000	ND
RR-12-.5	0.5	11/8/2021	**740**	**1,400**	**3,200**	**4,400**	**2,200**	**670**	**1,000**	**260**	**760**	**1,300**	**2,300**	**2,300**	**9,100**	**3,000**	**260**	**22**	**11,000**	**5,800**	ND
RR-12-1.5	1.5	11/8/2021	**920**	**1,800**	**3,500**	**2,700**	**6,000**	**1,800**	**3,400**	**960**	**2,300**	**580**	**6,400**	**2,100**	**18,000**	**2,400**	**860**	**52**	**6,100**	**17,000**	ND
RR-13-.5	0.5	11/8/2021	<250	<250	**110**	<250	**520**	**1,000**	**660**	**930**	**850**	<250	**630**	<250	**360**	<250	**920**	<7.1	**83**	**480**	ND
RR-13-1.5	1.5	11/8/2021	<250	<250	<250	<250	**62**	**130**	**79**	**110**	**100**	<250	**74**	<250	<250	<250	**110**	<5.7	<250	**55**	ND
RR-15-.5	0.5	11/8/2021	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<5.4	<250	<250	ND
RR-15-1.5	1.5	11/8/2021	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<5.8	<250	<250	ND
RR-17-.5	0.5	11/8/2021	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<16	<1,000	<1,000	ND
RR-17-1.5	1.5	11/8/2021	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<2,500	<4.9	<2,500	<2,500	ND
RR-18-.5	0.5	11/8/2021	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<5.6	<250	<250	ND
RR-18-1.5	1.5	11/8/2021	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<5.0	<250	<250	ND
RR-19-.5	0.5	11/8/2021	<250	<250	<250	<250	**140**	**160**	**140**	**130**	**140**	<250	**220**	<250	**210**	<250	**130**	<6.1	**130**	**220**	ND
RR-19-1.5	1.5	11/8/2021	<250	<250	<250	<250	**43**	**45**	<250	**56**	<250	<250	**62**	<250	<250	<250	<250	<6.9	<250	<250	ND

Notes:
ft bgs = feet below ground surface
USEPA = United States Environmental Protection Agency
µg/kg = micrograms per kilogram
USEPA Industrial Soil RSL = USEPA Regional Screening Level for Industrial Soil (May 2021)
DTSC Commercial/Industrial Soil SL = California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 3 Screening Level for Commercial/Industrial Soil (June 2020)
NS = No standard established
Bold indicates that value exceeds laboratory reporting limit
<X = analyte not detected above laboratory reporting limit
Cells highlighted in orange exceed either one or both SLs
ND = Not detected above laboratory reporting limits
Lowest of the cancer and non-cancer endpoint screening levels are listed

Table 8

Soil Analytical Results - Chlorinated Herbicides

12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft bgs)	Date Sampled	Pentachlorophenol (PCP)	Other Chlorinated Herbicides
		Analytical Method	USEPA Method 8151A	
		Unit	µg/kg wet	
USEPA Commercial/Industrial Soil RSL			4000	varies
DTSC Commercial/ Industrial Soil RSL			2000	varies
RR-1-.5	0.5	11/8/2021	<100	ND
RR-1-1.5	1.5	11/8/2021	<100	ND
RR-2-.5	0.5	11/8/2021	<100	ND
RR-2-1.5	1.5	11/8/2021	<100	ND
RR-3-.5	0.5	11/8/2021	<10.0	ND
RR-3-1.5	1.5	11/8/2021	<10.0	ND
RR-4-.5	0.5	11/8/2021	**52.6**	ND
RR-4-1.5	1.5	11/8/2021	**14.5**	ND
RR-7-.5	0.5	11/8/2021	<50.0	ND
RR-7-1.5	1.5	11/8/2021	<100	ND
RR-9-.5	0.5	11/8/2021	<100	ND
RR-9-1.5	1.5	11/8/2021	<50.0	ND
RR-12-.5	0.5	11/8/2021	<50.0	ND
RR-12-1.5	1.5	11/8/2021	**10.2**	ND
RR-13-.5	0.5	11/8/2021	<20.0	ND
RR-13-1.5	1.5	11/8/2021	<10.0	ND
RR-15-.5	0.5	11/8/2021	<10.0	ND
RR-15-1.5	1.5	11/8/2021	<10.0	ND
RR-17-.5	0.5	11/8/2021	<20.0	ND
RR-17-1.5	1.5.	11/8/2021	<10.0	ND
RR-18-.5	0.5	11/8/2021	<10.0	ND
RR-18-1.5	1.5	11/8/2021	<10.0	ND
RR-19-.5	0.5	11/8/2021	<10.0	ND
RR-19-1.5	1.5	11/8/2021	<10.0	ND

Notes:

USEPA = United States Environmental Protection Agency

µg/kg = micrograms per kilogram

Bold indicates that value exceeds laboratory reporting limit

Italics indicate sample is a duplicate

<X = analyte not detected above laboratory reporting limit

Cells highlighted in orange exceed both SLs

DTSC Commercial/Industrial Soil SL = California Department of Toxic Substances Control (DTSC) Human and Ecological
Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 3 Screening Level for Commercial/Industrial Soil (June 2020)

USEPA Commercial/Industrial Soil RSL = USEPA Regional Screening Level for Commercial/Industrial Soil (May 2021)

Bold indicates that value exceeds laboratory reporting limit

ND = Not detected above laboratory reporting limits

Table 9
Soil Vapor Analytical Results - Volatile Organic Compounds (VOCs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft)	Date Sampled	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	2-Hexanone	4-Ethyltoluene	4-Methyl-2-Pentanone	Acetone	Benzene	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Ethylbenzene	Freon 113	Freon 12	Isopropanol (IPA)	m,p-Xylenes	Methylene Chloride	n-Hexane	o-Xylene	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Trichlorofluoromethane	Xylene (total)	Other Analyzed VOCs
Analytical Method			USEPA Method TO-15																												
Unit			µg/m³																												
USEPA Industrial Indoor Air RSL			NS	260	260	22,000	130	NS	13,000	NS	1.6	3,100	2	0.53	390	180	4.9	22,000	440	880	440	1,200	3,100	440	4,400	47	22,000	3	NS	440	Varies
DTSC Industrial Indoor Air SL			310	NS	NS	NS	NS	NS	NS	NS	0.42	NS	2	NS	NS	35	NS	NS	NS	NS	NS	12	NS	NS	3,900	2	1,300	3*	5,300	NS	Varies
USEPA Industrial Indoor Air RSL (AF=0.03)			NS	8667	8667	733,333	4,333	NS	433,333	NS	53	103,333	67	18	13,000	6,000	163	733,333	14,667	29,333	14,667	40,000	103,333	14,667	146,667	1,567	733,333	100	NS	14,667	Varies
DTSC Industrial Indoor Air SL (AF=0.03)			10333	NS	NS	NS	NS	NS	NS	NS	14	NS	67	NS	NS	1,167	NS	NS	NS	NS	NS	400	NS	NS	130,000	67	43,333	100*	176,667	NS	Varies
RSB-28-5	5	1/6/2021	NA	<13	<13	NA	NA	NA	NA	NA	**20**	NA	NA	<13	NA	NA	<13	NA	NA	NA	<26	NA	NA	<13	NA	<13	<13	<13	NA	NA	ND
RSB-28-15	15	11/4/2021	<380	<470	<470	<1,400	<980	<470	<390	<1,100	**71**	<300	<600	<470	<200	<380	<420	<740	<470	<1,200	**30**	**95**	**5,800**	<420	<410	**190**	<360	<520	<540	**30**	ND
RSB-28-15-DUP	15	11/4/2021	<380	<470	<470	<1,400	<980	<470	<390	<1,100	**66**	<300	<600	<470	<200	<380	<420	<740	<470	<1,200	**30**	**100**	**6,000**	<420	<410	**200**	<360	<520	<540	**30**	ND
RSB-28-30	30	1/6/2021	NA	NA	<13	NA	NA	NA	NA	NA	**10**	NA	NA	<13	NA	NA	<13	NA	NA	NA	<26	NA	NA	<13	NA	NA	<13	<13	NA	NA	ND
RSB-28-R1-5	5	11/4/2021	<380	<470	<470	<1,400	<980	<470	<390	<1,100	**130**	<300	<600	<470	<200	<380	<420	<740	<470	<1,200	**47**	**98**	**8,400**	<420	<410	**210**	<360	<520	<540	**47**	ND
RSB-28-R2-5	5	11/4/2021	<480	<590	<590	<1,800	<1,200	<590	<490	<1,400	**190**	<370	<750	<590	<250	<480	<520	<920	<590	<1,500	**55**	**170**	**11,000**	<520	<510	**250**	**130**	<640	<670	**55**	ND
RSB-28-R3-5	5	11/4/2021	<240	<290	<290	<880	<610	<290	<250	<710	**170**	<190	<380	<290	<120	<240	<260	<460	<300	<740	**31**	**73**	**18,000**	<260	<260	**160**	<230	<320	<340	**31**	ND
RSB-28-R4-5	5	3/7/2022	<1.2	**<1.5**	<1.5	<4.4	<3.1	<1.5	<1.2	**13**	<1.0	**1.0**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.4**	**5.8**	<2.6	<1.0	<1.1	<1.3	<1.3	**11.0**	<1.1	<1.6	**2.6**	<1.3	ND
RSB-28-R4-15	15	3/7/2022	<1.2	<1.5	<1.5	**6.9**	<3.1	<1.5	**4.2**	**17**	**3.2**	**25**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.4**	**6.5**	<2.6	<1.0	**1.5**	<1.3	<1.3	**6.7**	**3.8**	<1.6	**2.5**	<1.3	ND
RSB-28-R5-5	5	3/7/2022	<1.2	<1.5	<1.5	**4.6**	<3.1	<1.5	<1.2	**10**	**1.7**	**3.3**	<1.9	**1.9**	<0.6	<1.2	<1.3	<2.3	**2.2**	**3.7**	<2.6	<1.0	**1.1**	<1.3	<1.3	**6.5**	**4.7**	<1.6	<1.7	<1.3	ND
RSB-28-R5-15	15	3/7/2022	<1.2	<1.5	<1.5	**8.7**	<3.1	<1.5	<1.2	**14**	**1.5**	**3.3**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.1**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**16**	**2.1**	<1.6	<1.7	<1.3	ND
RSB-28-R6-5	5	3/7/2022	<1.2	<1.5	<1.5	**5.8**	<3.1	<1.5	<1.2	**9.8**	**1.1**	**6.3**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**61**	**4.3**	<1.6	<1.7	<1.3	ND
RSB-28-R6-15	15	3/7/2022	<1.2	**1.9**	<1.5	**11**	<3.1	<1.5	**3.5**	**14**	**2.8**	**12**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.2**	**4.0**	<2.6	<1.0	**1.3**	<1.3	<1.3	**81**	**7.2**	<1.6	<1.7	<1.3	ND
RSB-28-R7-5	5	3/7/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**11**	<1.0	**1.2**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**9.7**	<1.1	<1.6	<1.7	<1.3	ND
RSB-28-R7-15	15	3/7/2022	<1.2	**3.4**	<1.5	**11**	<3.1	<1.5	**2.8**	**24**	**1.0**	**4.4**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.4**	**6.7**	**3.4**	<1.0	<1.1	**1.4**	<1.3	**13**	**7.3**	<1.6	**2.0**	**4.8**	ND
RSB-28-R8-15	15	3/7/2022	<1.2	<1.5	<1.5	**9.7**	<3.1	<1.5	**1.3**	**9.5**	<1.0	**3.9**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**160**	**2.2**	<1.6	**3.5**	<1.3	ND
RSB-28-R8-15-DUP	15	3/7/2022	<1.2	<1.5	<1.5	**9.4**	<3.1	<1.5	<1.2	**9.2**	<1.0	**3.7**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**170**	**2.2**	<1.6	**3.6**	<1.3	ND
RSB-29-5	5	1/6/2021	NA	<13	NA	NA	NA	NA	NA	NA	**220**	NA	NA	<13	NA	NA	**20**	NA	NA	NA	**20**	NA	NA	**20**	NA	<13	<13	<13	NA	NA	ND
RSB-29-15	15	11/4/2021	<120	<150	<150	<440	<310	<150	<120	<360	**130**	**23**	<190	<150	<62	<120	<130	<230	<150	<370	**53**	**39**	**1,400**	<130	<130	**84**	<110	<160	<170	**53**	ND
RSB-29-15-DUP	15	11/4/2021	<120	<150	<150	<440	<310	<150	<120	<360	**140**	<93	<190	<150	<62	<120	<130	<230	<150	<370	**53**	**44**	**1,500**	<130	<130	**75**	<110	<160	<170	**53**	ND
RSB-29-30	30	1/6/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	NA	<13	NA	NA	NA	<26	NA	NA	<13	NA	**10**	**60**	<13	NA	NA	ND
RSB-29-R1-5	5	11/4/2021	<190	<240	<240	<710	<490	<240	<200	<570	**140**	**74**	<300	<230	<99	<190	<210	<370	<240	<590	**36**	**47**	**3,100**	**46**	<200	**130**	<180	<260	<270	**82**	ND
RSB-29-R2-5	5	11/4/2021	<120	<150	<150	<440	<310	<150	<120	<360	**62**	<93	<190	<150	<62	<120	<130	<230	<150	<370	**28**	**32**	**2,100**	<130	<130	**81**	<110	<160	<170	**28**	ND
RSB-29-R3-5	5	11/4/2021	<120	**12**	**18**	**93**	<310	<150	<120	<360	**150**	**5.4**	<190	<150	<62	<120	**16**	**33**	<150	**38**	**77**	**39**	**970**	<130	<130	<200	**17**	<160	<170	**77**	ND
RSB-29-R4-5	5	3/7/2022	<1.2	**4.6**	<1.5	<4.4	<3.1	<1.5	<1.2	**14**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.1**	**4.8**	<2.6	<1.0	<1.1	<1.3	<1.3	**5.3**	**1.4**	<1.6	<1.7	<1.3	ND
RSB-29-R4-5-DUP	5	3/7/2022	<1.2	**4.6**	<1.5	<4.4	<3.1	<1.5	<1.2	**6.2**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.2**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**6.6**	<1.1	<1.6	<1.7	<1.3	ND
RSB-29-R4-15	15	3/7/2022	<1.2	<1.5	<1.5	**6.1**	<3.1	<1.5	**1.3**	**29**	<1.0	**4.1**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.2**	**6.4**	<2.6	<1.0	<1.1	<1.3	<1.3	**11**	**30**	<1.6	<1.7	<1.3	ND
RSB-29-R5-5	5	3/7/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**12**	**3.1**	**1.1**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.1**	**8.9**	<2.6	**3.5**	**1.3**	<1.3	<1.3	**6.0**	**4.8**	<1.6	<1.7	<1.3	ND
RSB-29-R5-15	15	3/7/2022	<1.2	<1.5	<1.5	**11**	<3.1	<1.5	**4.2**	**18**	**2.2**	**13**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.1**	**6.1**	**2.8**	<1.0	**1.2**	<1.3	<1.3	**14**	**12.0**	<1.6	<1.7	**2.8**	ND
RSB-29-R6-5	5	3/7/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**9.3**	<1.0	**2.6**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.1**	**6.0**	<2.6	<1.0	<1.1	<1.3	<1.3	**2.5**	**2**	<1.6	<1.7	<1.3	ND
RSB-29-R6-15	15	3/7/2022	<1.2	**1.6**	<1.5	**9.9**	<3.1	<1.5	**5.2**	**8.6**	**3.7**	**24**	<1.9	**2.1**	<0.6	<1.2	<1.3	<2.3	**1.9**	**6.3**	**3.5**	<1.0	**2.2**	<1.3	<1.3	**8.5**	**6.0**	<1.6	<1.7	**3.5**	ND
RSB-29-R7-5	5	3/7/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**14**	**2.0**	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**1.9**	**6.6**	<2.6	**2.5**	**20**	<1.3	<1.3	<2.0	**1.8**	<1.6	<1.7	<1.3	ND
RSB-29-R7-15	15	3/7/2022	<1.2	**1.9**	<1.5	**6.6**	<3.1	<1.5	<1.2	**14**	**4.1**	<0.9	<1.9	<1.5	<0.6	<1.2	**1.8**	<2.3	**1.9**	**6.2**	**3.3**	<1.0	**100**	**1.9**	<1.3	**6.5**	**5.1**	<1.6	<1.7	**5.1**	ND
RSB-29-R8-15	15	3/7/2022	<3.8	<4.7	<4.7	**22**	<9.8	<4.7	<3.9	**160**	**13**	**93**	<6.0	<4.7	<2.0	<3.8	**4.9**	<7.4	<4.7	<12	<8.3	<3.3	**470**	**4.9**	<4.1	**15**	**3.9**	<5.2	<5.4	**4.9**	ND
RSB-29-R9-15	15	3/7/2022	<1.2	**2.5**	**2.6**	**9.9**	<3.1	<1.5	**1.6**	**25**	**35**	**73**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	<1.5	**4.4**	**5.4**	**1.1**	**14**	**2.6**	<1.3	<2.0	**2.0**	**2.6**	<1.7	**8.0**	ND
RSB-30-5	5	1/8/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**100**	**10**	**13**	NA	NA	ND
RSB-30-15	15	1/8/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**80**	**30**	**40**	NA	NA	ND
RSB-30-15	15	11/2/2021	<1.2	3.1	2.0	<4.4	<3.1	<1.5	<1.2	10	11.0	1.5	<1.9	<1.5	<0.6	<1.2	7.2	<2.3	2.7	25	19	<1.0	5.4	7.3	<1.3	**300**	54	9.9	2.4	27	ND
RSB-30-R1-5	5	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**7.9**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.6**	**32**	<2.6	<1.0	<1.1	<1.3	<1.3	**130**	<1.1	**8.1**	**2.1**	<1.3	ND
RSB-30-R1-15	15	11/5/2021	<1.3	**7.7**	**1.8**	**85**	**4.7**	**2.5**	**32**	**110**	**11**	**91**	<2.0	**13**	<0.7	<1.3	**7.1**	<2.5	**3.1**	<3.9	**17**	<1.1	**7.6**	**6.6**	**1.6**	65	**51**	**86**	**4.5**	**23**	ND
RSB-30-R1-15-DUP	15	11/5/2021	<1.3	**9.4**	**2.7**	**89**	**4.7**	**2.6**	**36**	**110**	**10**	**70**	<2.0	**12**	<0.7	<1.3	**7.6**	<2.5	**3.2**	<3.9	**19**	<1.1	**5.7**	**7.2**	**2.0**	**72**	**52**	**91**	**4.2**	**27**	ND
RSB-30-R2-5	5	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**8.1**	<1.0	**2.1**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.7**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**230**	<1.1	**9.0**	**2.1**	<1.3	ND
RSB-30-R2-15	15	11/5/2021	**1.6**	**5.2**	<1.5	**48**	**4.1**	<1.5	**30**	**48**	**1.7**	**21**	<1.9	**17**	<0.6	<1.2	**3.3**	<2.3	**3.2**	**7.3**	**9.3**	<1.0	<1.1	**3.4**	<1.3	**240**	**12**	**170**	**3.3**	**13**	ND
RSB-30-R3-5	5	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**4.3**	<1.0	**1.6**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.7**	**4.2**	<2.6	<1.0	<1.1	<1.3	<1.3	**680**	<1.1	**9.9**	**1.8**	<1.3	ND
RSB-30-R3-15	15	11/5/2021	<1.2	**6.2**	**1.7**	**48**	**4.5**	**1.6**	**23**	**60**	**5.3**	**29**	<1.9	**11**	<0.6	<1.2	**5.0**	<2.3	**3.0**	<3.7	**11**	<1.0	**2.2**	**4.7**	<1.3	**540**	**25**	**81**	**2.5**	**16**	ND
RSB-30-R4-5	5	3/8/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**10**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**27**	**1.5**	<1.6	<1.7	<1	ND
RSB-30-R4-5-DUP	5	3/8/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**4.9**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.2**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**29**	**1.4**	<1.6	<1.7	<1.3	ND
RSB-30-R4-15	15	3/8/2022	**3.5**	**1.7**	**1.7**	**6.4**	<3.1	<1.5	**1.4**	**14**	**8.1**	**4.1**	<1.9	**20**	<0.6	<1.2	**2.9**	<2.3	**2.5**	<3.7	**7.1**	<1.0	**4.7**	**3.9**	<1.3	**73**	**16**	**76**	<1.7	**11**	ND
RSB-30-R5-5	5	3/8/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**20**	**1.5**	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	**5.5**	<2.6	<1.0	<1.1	<1.3	<1.3	**66**	**1.8**	**5.0**	<1.7	<1.3	ND
RSB-30-R5-15	15	3/8/2022	**1.8**	<1.5	<1.5	**5.9**	<3.1	<1.5	**4.9**	**13**	**11**	**7.9**	<1.9	**6.9**	<0.6	<1.2	**2.5**	<2.3	**2.3**	**5.8**	**5.3**	**1.4**	**1.8**	**2.0**	**1.6**	**67**	**19**	**23**	<1.7	**7.4**	ND
RSB-30-R6-35	35	3/8/2022	**28**	<1.5	<1.5	**18**	<3.1	<1.5	**4.5**	**22**	**3.3**	**5.7**	**2.4**	**86**	<0.6	<1.2	**2.9**	<2.3	**3.0**	<3.7	**10**	**1.4**	**3.6**	**3.1**	**1.3**	**88**	**7.4**	**550**	**3.8**	**13**	ND
RSB-32-5	5	1/7/2021	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	**10**	NA	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	**10**	<13	<13	<13	ND
RSB-32-30	30	1/7/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	**100**	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	<13	**10**	<13	NA	NA	ND
RSB-38-5	5	1/8/2021	NA	<13	<13	NA	NA	NA	NA	NA	<12	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**650**	<13	<13	NA	NA	ND
RSB-38-15	15	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**40**	<1.0	**1.9**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.7**	**35**	<2.6	<1.0	<1.1	<1.3	<1.3	**1,000**	<1.1	**8.8**	**3.7**	<1.3	ND
RSB-38-15-DUP	15	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**12**	<1.0	**2.0**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	**9.9**	<2.6	<1.0	<1.1	<1.3	<1.3	**1,000**	<1.1	**1.8**	**3.7**	<1.3	ND
RSB-38-R1-5	5	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**10**	<1.0	**3.2**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.4**	**19**	<2.6	<1.0	<1.1	<1.3	<1.3	**570**	**1.3**	<1.6	**3.1**	<1.3	ND
RSB-38-R2-5	5	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**19**	<1.0	**9.3**	<1.9	**8.0**	<0.6	<1.2	<1.3	<2.3	**2.3**	**9.8**	<2.6	<1.0	<1.1	<1.3	<1.3	**170**	<1.1	<1.6	**5.6**	<1.3	ND
RSB-38-R3-5	5	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**15**	<1.0	**1.6**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.8**	**24**	<2.6	**1.2**	<1.1	<1.3	<1.3	**110**	<1.1	**4.1**	**4.7**	<1.3	ND

Table 9
Soil Vapor Analytical Results - Volatile Organic Compounds (VOCs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft)	Date Sampled	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	2-Hexanone	4-Ethyltoluene	4-Methyl-2-Pentanone	Acetone	Benzene	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Ethylbenzene	Freon 113	Freon 12	Isopropanol (IPA)	m,p-Xylenes	Methylene Chloride	n-Hexane	o-Xylene	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Trichlorofluoromethane	Xylene (total)	Other Analyzed VOCs
Analytical Method			USEPA Method TO-15																												
Unit			µg/m³																												
USEPA Industrial Indoor Air RSL			NS	260	260	22,000	130	NS	13,000	NS	1.6	3,100	2	0.53	390	180	4.9	22,000	440	880	440	1,200	3,100	440	4,400	47	22,000	3	NS	440	Varies
DTSC Industrial Indoor Air SL			310	NS	NS	NS	NS	NS	NS	NS	0.42	NS	2	NS	NS	35	NS	NS	NS	NS	NS	12	NS	NS	3,900	2	1,300	3*	5,300	NS	Varies
USEPA Industrial Indoor Air RSL (AF=0.03)			NS	8667	8667	733,333	4,333	NS	433,333	NS	53	103,333	67	18	13,000	6,000	163	733,333	14,667	29,333	14,667	40,000	103,333	14,667	146,667	1,567	733,333	100	NS	14,667	Varies
DTSC Industrial Indoor Air SL (AF=0.03)			10333	NS	NS	NS	NS	NS	NS	NS	14	NS	67	NS	NS	1,167	NS	NS	NS	NS	NS	400	NS	NS	130,000	67	43,333	100*	176,667	NS	Varies
RSB-38-R4-5	5	3/8/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**12**	<1.0	**1.9**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	**4.3**	<2.6	<1.0	<1.1	<1.3	<1.3	**2.3**	**2.2**	<1.6	**2.4**	<1.3	ND
RSB-38-R4-15	15	3/8/2022	<1.2	<1.5	<1.5	**4.7**	<3.1	<1.5	<1.2	**12**	**1.3**	**5.1**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.4**	<3.7	<2.6	**1.3**	<1.1	<1.3	<1.3	**3.1**	**5.3**	<1.6	**3.1**	<1.3	ND
RSB-38-R5-5	5	3/8/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**16**	**1.4**	**12**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.8**	**4.9**	<2.6	<1.0	**1.1**	<1.3	<1.3	**3.7**	**5.1**	<1.6	**6.3**	<1.3	ND
RSB-38-R5-15	15	3/8/2022	<1.2	<1.5	<1.5	**8.2**	<3.1	**2.0**	<1.2	**22**	**2.1**	**18**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**3.0**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**6.1**	**7.4**	<1.6	**7.8**	<1.3	ND
RSB-38-R6-5	5	3/8/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**21**	**1.1**	**2.0**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**3.0**	<3.7	<2.6	<1.0	**1.5**	<1.3	<1.3	**17**	**2.1**	<1.6	**8.6**	<1.3	ND
RSB-38-R6-15	15	3/8/2022	<1.2	<1.5	<1.5	**5.1**	<3.1	<1.5	<1.2	**17**	**5.5**	**20**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**3.4**	<3.7	<2.6	<1.0	**2.1**	<1.3	<1.3	**24**	**6.9**	**13**	**11**	<1.3	ND
RSB-38-R7-35	35	3/8/2022	**9.9**	<1.5	<1.5	**7.9**	<3.1	<1.5	<1.2	**12**	<1.0	**3.0**	**2.0**	**25**	<0.6	<1.2	<1.3	<2.3	**3.7**	<3.7	<2.6	<1.0	**1.1**	<1.3	<1.3	**45**	<1.1	**270**	**7.8**	<1.3	ND
RSB-53-5	5	1/8/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**210**	<13	<13	NA	NA	ND
RSB-53-15	15	11/3/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**4.2**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.0**	<3.7	<2.6	**1.4**	<1.1	<1.3	<1.3	**1,100**	**6.4**	<1.6	<1.7	<1.3	ND
RSB-53-R1-5	5	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	<3.6	<1.0	**1.9**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.5**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**88**	**1.3**	<1.6	**3.2**	<1.3	ND
RSB-53-R2-5	5	11/2/2021	<2.4	<2.9	<2.9	<8.8	<6.1	<2.9	<2.5	<7.1	<1.9	<1.9	<3.8	<2.9	<1.2	<2.4	<2.6	<4.6	<3.0	<7.4	<5.2	<2.1	**250**	<2.6	<2.6	**82**	**3.4**	<3.2	**4.3**	<2.6	ND
RSB-53-R3-5	5	11/3/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**10**	<1.0	**1.9**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.2**	**7.7**	<2.6	**1.3**	<1.1	<1.3	<1.3	**200**	**2.4**	**11**	<1.7	<1.3	ND
RSB-53-R4-5	5	11/3/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	<3.6	<1.0	**1.7**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.2**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**1,300**	**1.3**	<1.6	<1.7	<1.3	ND
RSB-53-R5-5	5	11/3/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**16**	<1.0	**2.9**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.1**	**3.7**	<2.6	**1.1**	<1.1	<1.3	<1.3	**93**	**4.7**	<1.6	<1.7	<1.3	ND
RSB-53-R6-5	5	11/3/2021	<1.3	<1.6	<1.6	<4.7	<3.3	<1.6	<1.3	**7.5**	<1.0	**2.7**	<2.0	<1.6	<0.7	<1.3	<1.4	<2.5	**1.9**	**41**	<2.8	**1.3**	<1.1	<1.4	<1.4	**100**	**5.7**	<1.7	<1.8	<1.4	ND
RSB-53-R7-5	5	11/3/2021	<1.6	<2.0	<2.0	**6.3**	<4.1	<2.0	<1.6	**42**	<1.3	**5.2**	<2.5	<2.0	<0.8	<1.6	<1.7	<3.1	**2.1**	**7.2**	<3.5	**9.0**	**1.8**	<1.7	<1.7	**190**	**3.9**	<2.1	<2.2	<1.7	ND
RSB-53-R10-5	5	3/7/2022	<1.2	**1.7**	<1.5	**6.3**	<3.1	<1.5	<1.2	**21**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	**6.0**	<2.6	<1.0	<1.1	<1.3	<1.3	**55**	**1.7**	**12**	**1.8**	<1.3	ND
RSB-53-R10-15	15	3/7/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**12**	**1.1**	**1.4**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.4**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**24**	**2.1**	<1.6	<1.7	<1.3	ND
RSB-53-R11-5	5	3/7/2022	<1.2	**3.2**	<1.5	**4.8**	<3.1	<1.5	<1.2	**18**	<1.0	**1.1**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.5**	**8.1**	<2.6	<1.0	<1.1	<1.3	<1.3	**23**	<1.1	<1.6	**3.4**	<1.3	ND
RSB-53-R11-15	15	3/7/2022	<1.2	**2.3**	<1.5	**9.5**	<3.1	<1.5	<1.2	**27**	<1.0	**1.0**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.5**	**7.8**	<2.6	<1.0	<1.1	<1.3	<1.3	**44**	**1.2**	**7.1**	<1.7	<1.3	ND
RSB-53-R12-15	15	3/7/2022	<1.2	**4.6**	<1.5	**6.4**	<3.1	<1.5	<1.2	**6.3**	<1	**1.3**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**210**	**1.2**	**7.1**	<1.7	<1.3	ND
RSB-53-R13-15	15	3/7/2022	<3.0	<3.7	<3.7	<11	<7.7	<3.7	<3.1	**18**	<2.4	<2.3	<4.7	<3.7	<1.5	<3.0	<3.3	<5.7	<3.7	<9.2	<6.5	<2.6	<2.6	<3.3	<3.2	**880**	<2.8	<4.0	<4.2	<3.3	ND
RSB-53-R13-15-DUP	15	3/7/2022	<3.0	<3.7	<3.7	<11	<7.7	<3.7	<3.1	**16**	<2.4	<2.3	<4.7	<3.7	<1.5	<3.0	<3.3	<5.7	<3.7	<9.2	<6.5	<2.6	<2.6	<3.3	<3.2	**970**	<2.8	<4.0	<4.2	<3.3	ND
RSB-53-R14-35	35	3/7/2022	<1.2	**2.7**	<1.5	**12**	<3.1	<1.5	**2.2**	**23**	**3.7**	**6.5**	<1.9	<1.5	<0.6	<1.2	**1.3**	<2.3	**2.3**	<3.7	**3.1**	<1.0	<1.1	<1.3	<1.3	**540**	**11**	**12**	**1.8**	**3.1**	ND
RSB-53-R15-15	15	3/7/2022	<1.2	**4.9**	<1.5	**9.3**	<3.1	<1.5	**1.6**	**51**	**1.3**	**3.8**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	**7.7**	**5.0**	**1.1**	**3.1**	**1.9**	<1.3	**660**	**42**	**5.3**	<1.7	**6.9**	ND
RSB-53-R15-35	35	3/7/2022	<1.2	**5.5**	<1.5	**7.0**	<3.1	<1.5	**1.5**	**40**	**1.2**	**4.3**	<1.9	<1.5	<0.6	<1.2	**1.5**	<2.3	**2.4**	**4.2**	**6.2**	<1.0	**1.3**	**2.3**	<1.3	**840**	**64**	**31**	**1.8**	**8.5**	ND
RSB-53-R8-5	5	3/7/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**7.3**	<1.0	<0.9	<1.9	<1.5	<0.6	**1.2**	<1.3	<2.3	**2.4**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**440**	<1.1	<1.6	**7.1**	<1.3	ND
RSB-53-R8-15	15	3/7/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**11**	<1.0	**2.2**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**460**	**2.0**	**4.3**	**3.4**	<1.3	ND
RSB-53-R9-5	5	3/7/2022	<1.2	**2.5**	<1.5	<4.4	<3.1	<1.5	<1.2	**12**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	**6.4**	<2.6	<1.0	<1.1	<1.3	<1.3	**25**	<1.1	<1.6	<1.7	<1.3	ND
RSB-53-R9-15	15	3/7/2022	<1.2	<1.5	<1.5	**7.7**	<3.1	<1.5	<1.2	**14**	<1.0	**1.0**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**45**	<1.1	**3.5**	<1.7	<1.3	ND
RSB-54-5	5	1/8/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**100,000**	<13	<13	NA	NA	ND
	5	2/1/2021	NA	<500	<500	NA	NA	NA	NA	NA	<500	NA	NA	<500	NA	<500	<500	NA	NA	NA	<26	NA	NA	<500	NA	**34,000**	<500	<1	NA	NA	ND
RSB-54-CL-15	15	2/1/2021	NA	<25	<25	NA	NA	NA	NA	NA	<25	NA	NA	<25	NA	<25	<25	NA	NA	NA	<50	NA	NA	<25	NA	**7,800**	<25	<25	NA	NA	ND
RSB-54-CL-35	35	2/1/2021	NA	<25	<25	NA	NA	NA	NA	NA	<25	NA	NA	<25	NA	<25	<25	NA	NA	NA	<50	NA	NA	<25	NA	**240**	<25	<25	NA	NA	ND
RSB-54-E-5	5	2/1/2021	NA	<25	<25	NA	NA	NA	NA	NA	<25	NA	NA	<25	NA	<25	<25	NA	NA	NA	<50	NA	NA	<25	NA	**3,100**	<25	<25	NA	NA	ND
RSB-54-E-15	15	2/1/2021	NA	<25	<25	NA	NA	NA	NA	NA	<25	NA	NA	<25	NA	<25	<25	NA	NA	NA	<50	NA	NA	<25	NA	**1,900**	**40**	<26	NA	NA	ND
RSB-54-E-35	35	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**80**	**10**	<13	NA	NA	ND
RSB-54-E1-5	5	11/3/2021	<1.3	<1.6	<1.6	<4.7	<3.3	<1.6	**1.4**	**17**	<1.0	**1.8**	<2.0	<1.6	<0.7	<1.3	<1.4	<2.5	**2.3**	**7.0**	<2.8	**1.5**	<1.1	<1.4	<1.4	**790**	**1.3**	<1.7	<1.8	<1.4	ND
RSB-54-E1-15	15	11/3/2021	<13	<16	<16	<47	<33	<16	<13	<38	<10	<10	<20	<16	<6.6	<13	<14	<25	<16	<39	<28	<11	<11	<14	<14	**2,500**	<12	**23**	<18	<14	ND
RSB-54-E2-5	5	11/3/2021	<6.3	<7.9	<7.9	<24	<16	<7.9	<6.6	<19	<5.1	<5.0	<10	<7.8	<3.3	<6.3	<6.9	<12	<7.9	**25**	<14	<5.6	<5.6	<6.9	<6.8	**1,500**	<6.0	<8.6	<9.0	<6.9	ND
RSB-54-E2-15	15	11/3/2021	<6.3	<7.9	<7.9	<24	<16	<7.9	<6.6	<19	<5.1	<5.0	<10	<7.8	<3.3	<6.3	<6.9	<12	<7.9	<20	<14	<5.6	<5.6	<6.9	<6.8	**1,700**	<6.0	**24**	<9.0	<6.9	ND
RSB-54-E3-35	35	3/7/2022	<4.8	<5.9	<5.9	<18	<12	<5.9	<4.9	**18**	<3.8	<3.7	<7.5	<5.9	<2.5	<4.8	<5.2	<9.2	<5.9	<15	<10	<4.2	<4.2	<5.2	<5.1	**860**	<4.5	**170**	<6.7	<5.2	ND
RSB-54-E4-5	5	3/7/2022	<1.2	<1.5	<1.5	**6.0**	<3.1	<1.5	<1.2	**18**	<1.0	**1.1**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.6**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**2.7**	<1.1	**2.4**	<1.7	<1.3	ND
RSB-54-E4-15	15	3/7/2022	<1.2	<1.5	<1.5	**12**	<3.1	<1.5	<1.2	**27**	**1.2**	**17**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.6**	<3.7	<2.6	<1.0	**1.9**	<1.3	<1.3	**2.2**	**1.3**	**2.4**	**2.2**	<1.3	ND
RSB-54-E4-35	35	3/7/2022	<1.2	<1.5	<1.5	**18**	<3.1	<1.5	<1.2	**36**	<1.0	**6.3**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**3.2**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**8.0**	**1.2**	**42**	**5.4**	<1.3	ND
RSB-54-N-5	5	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**10**	<13	<13	NA	NA	ND
RSB-54-N-15	15	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**110**	**90**	<13	NA	NA	ND
RSB-54-N-35	35	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**100**	**20**	<13	NA	NA	ND
RSB-54-N-35-DUP	35	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**130**	**40**	<13	NA	NA	ND
RSB-54-N-R1-15	15	11/2/2021	<1.2	<1.5	<1.5	**5.1**	<3.1	<1.5	<1.2	**8.5**	<1.0	**1.7**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.4**	**16**	<2.6	<1.0	**2.3**	<1.3	<1.3	**150**	<1.1	<1.6	**3.6**	<1.3	ND
RSB-54-N-R2-15	15	11/3/2021	<1.3	<1.6	<1.6	<4.7	<3.3	<1.6	<1.3	**6.3**	<1.0	**1.8**	<2.0	<1.6	<0.7	<1.3	<1.4	<2.5	**2.4**	**16**	<2.8	<1.1	<1.1	<1.4	<1.4	**35**	<1.2	<1.7	**4.9**	<1.4	ND
RSB-54-N-R3-15	15	11/3/2021	<1.2	**1.7**	<1.5	<4.4	<3.1	<1.5	<1.2	**7.7**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.2**	<3.7	**3.3**	<1.0	<1.1	**1.7**	<1.3	**14**	**2.5**	<1.6	**3.3**	**5.0**	ND
RSB-54-NE-5	5	3/7/2022	<1.2	**1.9**	<1.5	**7.4**	<3.1	<1.5	<1.2	**21**	<1.0	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.6**	**11**	<2.6	<1.0	<1.1	<1.3	<1.3	**12**	**1.5**	<1.6	**3.7**	<1.3	ND
RSB-54-NE-15	15	3/7/2022	<1.2	<1.5	<1.5	**13**	<3.1	<1.5	<1.2	**30**	<1.0	**1.2**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.8**	**7.8**	<2.6	<1.0	<1.1	<1.3	<1.3	**47**	**2.4**	**8.5**	**4.8**	<1.3	ND
RSB-54-NE-35	35	3/7/2022	<1.2	<1.5	<1.5	**17**	<3.1	<1.5	**2.1**	**38**	<1.0	**3.8**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.9**	**9.7**	<2.6	<1.0	**1.2**	<1.3	<1.3	**62**	**2.0**	**66**	**5.3**	<1.3	ND
RSB-54-NE-35-DUP	35	3/7/2022	<1.2	<1.5	<1.5	**16**	<3.1	<1.5	**2.0**	**33**	**1.0**	**4.0**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.9**	**4.2**	<2.6	<1.0	**1.1**	<1.3	<1.3	**66**	**2.0**	**68**	**5.3**	<1.3	ND
RSB-54-S-5	5	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**330**	<13	<13	NA	NA	ND
RSB-54-S-15	15	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**180**	**20**	<13	NA	NA	ND
RSB-54-S-35	35	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	**50**	**10**	<13	NA	NA	ND
RSB-54-S1-5	5	11/3/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	**1.4**	**13**	<1.0	**3.1**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	**15.0**	**4.6**	**3.7**	**1.3**	**1.7**	<1.3	**180**	**2.1**	**5.3**	<1.7	**6.3**	ND
RSB-54-S1-15	15	11/3/2021	<1.2	**1.9**	<1.5	**7.7**	<3.1	<1.5	**5.1**	**27**	**1.2**	**5.5**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	**4.2**	**1.1**	<1.1	**1.6**	<1.3	**570**	**6.1**	**53**	<1.7	**5.8**	ND
RSB-54-S2-5	5	3/7/2022	<1.2	<1.5	<1.5	**8.0**	<3.1	<1.5	<1.2	**22**	**1.3**	**1.6**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**23**	**1.7**	**5.0**	<1.7	<1.3	ND
RSB-54-S2-35	35	3/7/2022	<1.2	<1.5	<1.5	**5.9**	<3.1	<1.5	<1.2	**15**	**1.9**	**3.7**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.2**	<3.7	<2.6	<1.0	**1.8**	<1.3	<1.3	**12**	**4.0**	**35**	<1.7	<1.3	ND
RSB-54-SE-5	5	3/7/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**11**	<1.0	**1.3**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.6**	<3.7	<2.6	<1.0	**1.3**	<1.3	<1.3	**3.8**	**20**	**2.4**	<1.7	<1.3	ND
RSB-54-SE-15	15	3/7/2022	<1.2	<1.5	<1.5	**5.4**	<3.1	<1.5	<1.2	**14**	<1.0	**2.0**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.5**	**5.2**	<2.6	**1.8**	**1.2**	<1.3	<1.3	**14**	**3.7**	**83**	**2.3**	<1.3	ND
RSB-54-SE-35	35	3/7/2022	<1.2	<1.5	<1.5	**5.7**	<3.1	<1.5	<1.2	**18**	<1.0	**2.5**	<1.9	**3.6**	<0.6	<1.2	<1.3	<2.3	**2.7**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**30**	**2.0**	**520**	**3.1**	<1.3	ND

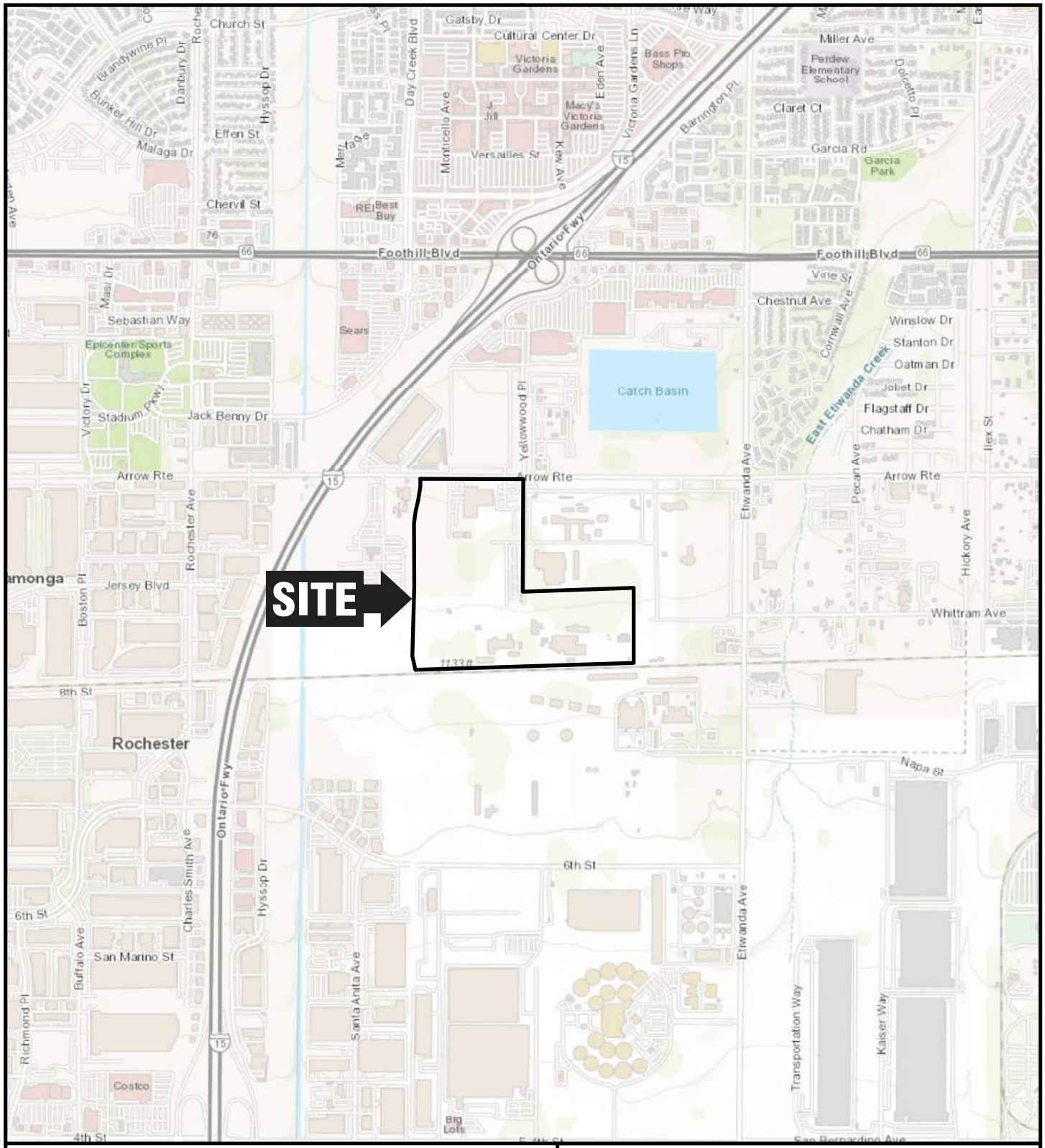
Table 9
Soil Vapor Analytical Results - Volatile Organic Compounds (VOCs)
12451 Arrow Route, Rancho Cucamonga, California

Sample ID	Depth (ft)	Date Sampled	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	2-Hexanone	4-Ethyltoluene	4-Methyl-2-Pentanone	Acetone	Benzene	Carbon Disulfide	Carbon Tetrachloride	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Ethylbenzene	Freon 113	Freon 12	Isopropanol (IPA)	m,p-Xylenes	Methylene Chloride	n-Hexane	o-Xylene	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Trichlorofluoromethane	Xylene (total)	Other Analyzed VOCs
Analytical Method			USEPA Method TO-15																												
Unit			µg/m³																												
USEPA Industrial Indoor Air RSL			NS	260	260	22,000	130	NS	13,000	NS	1.6	3,100	2	0.53	390	180	4.9	22,000	440	880	440	1,200	3,100	440	4,400	47	22,000	3	NS	440	Varies
DTSC Industrial Indoor Air SL			310	NS	NS	NS	NS	NS	NS	NS	0.42	NS	2	NS	NS	35	NS	NS	NS	NS	NS	12	NS	NS	3,900	2	1,300	3*	5,300	NS	Varies
USEPA Industrial Indoor Air RSL (AF=0.03)			NS	8667	8667	733,333	4,333	NS	433,333	NS	53	103,333	67	18	13,000	6,000	163	733,333	14,667	29,333	14,667	40,000	103,333	14,667	146,667	1,567	733,333	100	NS	14,667	Varies
DTSC Industrial Indoor Air SL (AF=0.03)			10333	NS	NS	NS	NS	NS	NS	NS	14	NS	67	NS	NS	1,167	NS	NS	NS	NS	NS	400	NS	NS	130,000	67	43,333	100*	176,667	NS	Varies
RSB-54-W-5	5	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	170	50	<13	NA	NA	ND
RSB-54-W-15	15	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	410	<13	<13	NA	NA	ND
RSB-54-W-35	35	2/1/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	580	380	<13	NA	NA	ND
RSB-60-5	5	1/8/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	130	<13	<13	NA	NA	ND
RSB-60-15	15	11/1/2021	**4.0**	<1.6	<1.6	<4.7	<3.3	<1.6	<1.3	**5.8**	**1.4**	<1.0	<2.0	<1.6	<0.7	<1.3	**2.4**	**18**	**2.5**	**17**	**8.3**	**1.4**	**1.2**	**4.1**	<1.4	470	**11**	**15**	<1.8	**12**	ND
RSB-60-R1-5	5	11/1/2021	<1.2	**2.8**	**2.1**	<4.4	<3.1	<1.5	<1.2	**7.0**	**1.7**	<0.9	<1.9	<1.5	<0.6	<1.2	**2.8**	<2.3	**2.5**	<3.7	**9.8**	<1.0	<1.1	**5.0**	<1.3	300	**13**	**3.8**	<1.7	**15**	ND
RSB-60-R2-5	5	11/1/2021	<1.3	**3.6**	**2.2**	<4.7	<3.3	<1.6	<1.3	**6.4**	**12**	**1.2**	<2.0	<1.6	<0.7	<1.3	**8.3**	**4.6**	**2.6**	**14**	**22**	<1.1	**6.0**	**7.7**	<1.4	350	**56**	**8.5**	**2.4**	**30**	ND
RSB-60-R3-5	5	11/2/2021	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**13**	**29**	**2.8**	<1.9	<1.5	<0.6	<1.2	**1.9**	<2.3	**2.7**	**33**	**3.7**	<1.0	**6.4**	**1.4**	<1.3	170	**38**	**9.3**	**4.8**	**5.1**	ND
RSB-60-R4-5	5	11/1/2021	<1.2	**2.8**	<1.5	<4.4	<3.1	**1.6**	<1.2	**11**	**1.1**	<0.9	<1.9	<1.5	<0.6	<1.2	**6.3**	<2.3	**2.5**	**7.6**	**13**	<1.0	<1.1	**5.2**	<1.3	140	**20**	**10**	**1.8**	**19**	ND
RSB-60-R5-5	5	3/8/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**13**	**1.2**	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.2**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	150	**1.9**	**4.2**	**1.9**	<1.3	ND
RSB-60-R5-5-DUP	5	3/8/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**7.1**	**1.2**	<0.9	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	160	**1.6**	**4.2**	**1.9**	<1.3	ND
RSB-60-R5-15	15	3/8/2022	<1.2	<1.5	<1.5	**6.4**	<3.1	<1.5	<1.2	**14**	**1.3**	**2.2**	<1.9	**4.5**	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	200	**3.9**	**46**	**2.2**	<1.3	ND
RSB-60-R5-15-DUP	15	3/8/2022	<1.2	<1.5	<1.5	**4.7**	<3.1	<1.5	<1.2	**5.6**	**1.7**	**2.1**	<1.9	**4.5**	<0.6	<1.2	<1.3	<2.3	**2.3**	<3.7	<2.6	<1.0	**1.3**	<1.3	<1.3	210	**4.3**	**45**	**2.2**	<1.3	ND
RSB-60-R6-5	5	3/8/2022	<1.2	<1.5	<1.5	<4.4	<3.1	<1.5	<1.2	**16**	<1.0	**1.3**	<1.9	<1.5	<0.6	<1.2	<1.3	<2.3	**2.7**	<3.7	<2.6	<1.0	<1.1	<1.3	<1.3	**21**	**1.4**	**47**	**3.8**	<1.3	ND
RSB-60-R6-15	15	3/8/2022	<1.2	<1.5	<1.5	**6.3**	<3.1	<1.5	<1.2	**11**	**2.3**	**5.3**	<1.9	**2.7**	<0.6	<1.2	<1.3	<2.3	**3.1**	<3.7	<2.6	<1.0	**1.1**	<1.3	<1.3	**13**	**1.9**	**200**	**5.9**	<1.3	ND
RSB-60-R8-15	15	3/8/2022	<1.2	**1.8**	<1.5	**6.0**	<3.1	<1.5	**2.6**	**21**	**3.7**	**2.9**	<1.9	**2.6**	<0.6	<1.2	**2.3**	<2.3	**2.3**	<3.7	**5.4**	<1.0	**1.3**	**2.2**	<1.3	150	**130**	**69**	<1.7	**7.6**	ND
RSB-60-R8-35	35	3/8/2022	**5.8**	<1.5	<1.5	**7.1**	<3.1	<1.5	<1.2	**13**	<1.0	**2.1**	<1.9	**28**	<0.6	<1.2	<1.3	<2.3	**2.7**	<3.7	<2.6	<1.0	**1.4**	<1.3	<1.3	190	**2.1**	**480**	**2.5**	<1.3	ND
RSB-61-5	5	1/28/2021	NA	<13	<13	NA	NA	NA	NA	NA	<13	NA	NA	<13	NA	<13	<13	NA	NA	NA	<26	NA	NA	<13	NA	90	<13	<13	NA	NA	ND
RSB-61-15	15	11/4/2021	<1.2	**1.3**	**0.3**	**8.1**	<3.1	<1.5	**10**	**18**	**0.4**	**3.2**	<1.9	<1.5	**0.1**	<1.2	**0.5**	**0.5**	**2.5**	**10**	**1.2**	**0.9**	**0.7**	**0.6**	<1.3	**17**	**2.1**	<1.6	**5.7**	**1.8**	ND
RSB-61-W-10	10	11/4/2021	<1.2	**2.0**	**0.5**	**3.1**	<3.1	<1.5	**7.7**	**12**	<1.0	**3.7**	<1.9	**0.3**	<0.6	<1.2	**0.3**	**0.5**	**2.5**	**13**	**1.2**	**0.6**	**0.3**	**0.7**	<1.3	**5.9**	**1.6**	<1.6	**3.5**	**1.9**	ND
RSB-61-E-10	10	11/4/2021	<1.2	**1.2**	<1.5	<4.4	<3.1	<1.5	**2.9**	**5.8**	**0.2**	**2.8**	<1.9	<1.5	<0.6	<1.2	**0.3**	**0.5**	**2.5**	<3.7	**0.9**	**0.3**	<1.1	**0.5**	<1.3	**29**	**1.1**	<1.6	**7.0**	**1.4**	ND
RSB-61-NW-10	10	11/4/2021	<1.2	**1.7**	<1.5	**12**	<3.1	<1.5	**1.0**	**8.2**	**0.4**	**2.8**	<1.9	<1.5	**0.2**	<1.2	**0.4**	**0.5**	**2.6**	**29**	**1.1**	**0.6**	**0.7**	**0.6**	<1.3	**9.5**	**1.6**	<1.6	**12.0**	**1.8**	ND

Notes:
ft = feet
VOCs = volatile organic compounds
USEPA = United States Environmental Protection Agency
µg/m³ = micrograms per cubic meter
USEPA Industrial Indoor Air RSL = USEPA Industrial Indoor Air Regional Screening Level with screening attenuation factor of 0.03, according to the California Department of Toxic Substances Control (DTSC) Draft Supplemental Guidance: Screening and Evaluating Vapor Intrusion (May 2021)
DTSC Commercial/Industrial Indoor Air SL = DTSC Commercial/Industrial Indoor Air SL with screening attenuation factor of 0.03, according to the DTSC Draft Supplemental Guidance: Screening and Evaluating Vapor Intrusion (June 2020)
AF = Attenuation Factor
NA = Not applicable
NS = No standard established
<X or ND = analyte not detected above laboratory reporting limit
Bold indicates that value exceeds laboratory reporting limit
Italics indicate sample is a duplicate
** Trichloroethene DTSC SL from HHRA Note 5 - "HERO strongly recommends consulting with the HERO toxicologist" when indoor air concentrations exceed 3 ug/m3*
Cells highlighted in gray indicate that data may not be reliable for its intended purpose due to leak check compound detection greater than 10 times the reporting limit.
Cells highlighted in green indicates data collected by Ramboll
Cells highlighted in orange exceed either one or both SLs

FIGURES

1. Site Location Map
2. Site Plan
3. Proposed Development Plan
4. Sample Locations
5. Sample Locations – NW Portion of Site
6. Sample Locations – SW Portion of Site
7. Sample Locations – SE Portion of Site
8. Parcel 2 – Lead in Soil
9. Southern Portion of Parcel 3 – Lead in Soil
10. Southern Portion of Parcel 3 – TPH in Soil
11. Parcel 2 – TPH in Soil
12. Rail Spur Parcels 2 and 3 – Exceedances in Soil
13. Southwestern Portion of Parcel 3 - PCE and Benzene in Soil Vapor
14. Southern Portion of Parcel 3 - PCE and Benzene in Soil Vapor
15. Northern Portion of Parcel 3 - PCE and Benzene in Soil Vapor
16. Parcel 3 with PCE Iso-Concentration Contours - 5 Feet bgs
17. Parcel 3 with PCE Iso-Concentration Contours - 15 Feet bgs
18. Parcel 3 with PCE Iso-Concentration Contours - 35 Feet bgs



LOCATION OF DETAIL



N

1,000 0 1,000'

Title:

SITE LOCATION MAP

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

Prepared for:

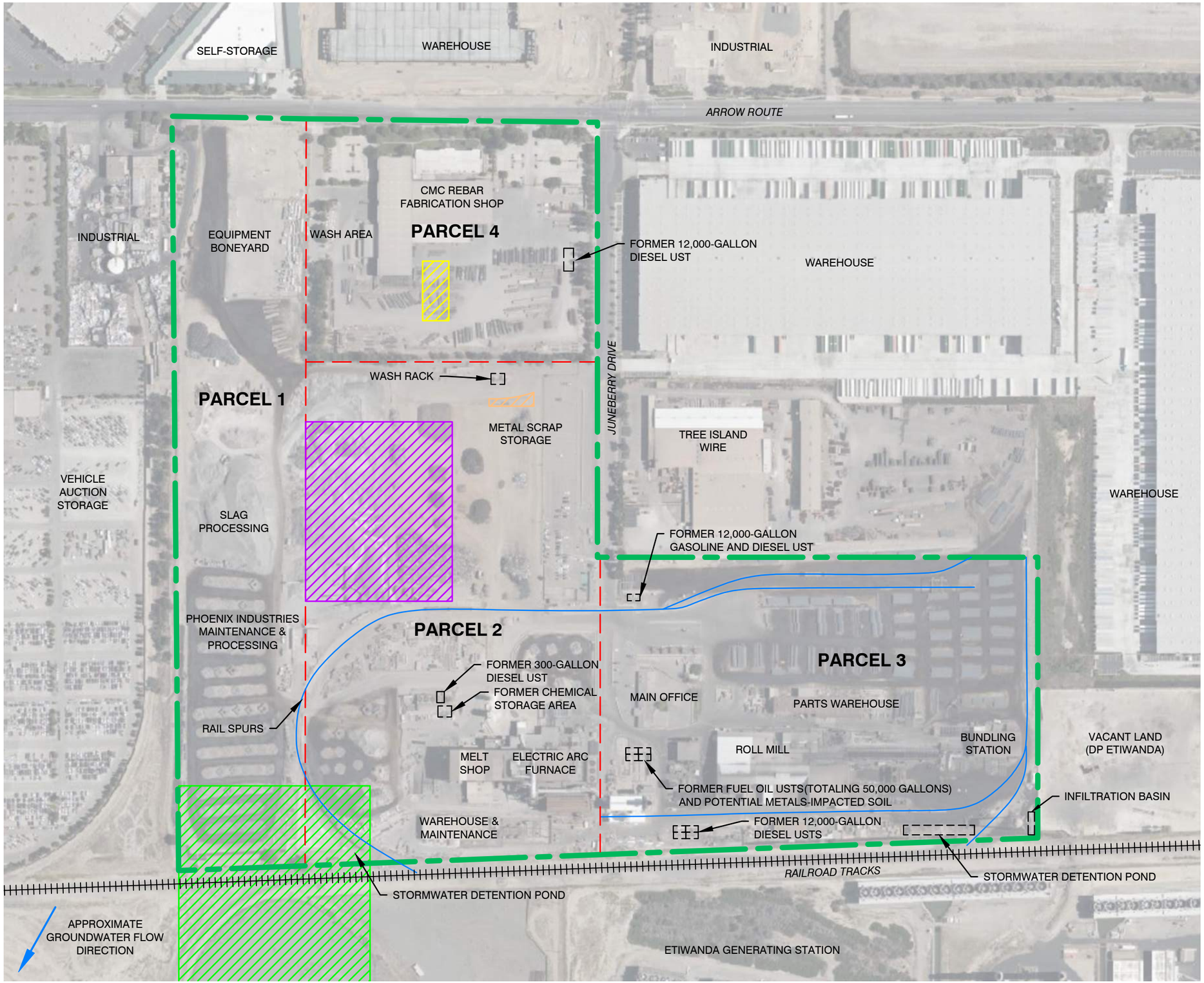
BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.M.	Date: 09/16/21
Prepared by: C.M.	Scale: As Shown
Project Mgr: M.J.N.	Project: 3200.0007L
File: 3200.0007L100.0.mxd	

FIGURE 1

S:\GIS\PROJECTS\3200\0007L\100\3200.0007L100.0.MXD



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- SLAG TRENCH REMEDIATION AREA (DTSC, DECEMBER 20, 2001)
- SLAG REMEDIATION AREA (SBCFD, JULY 2, 2002)
- PAD 16 REMEDIATION AREA (DTSC, APRIL 26, 2007)
- LEAD REMEDIATION AREA (RWQCB-SA, NOVEMBER 7, 1990)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

N

300' 0 300'

Title:

SITE PLAN

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

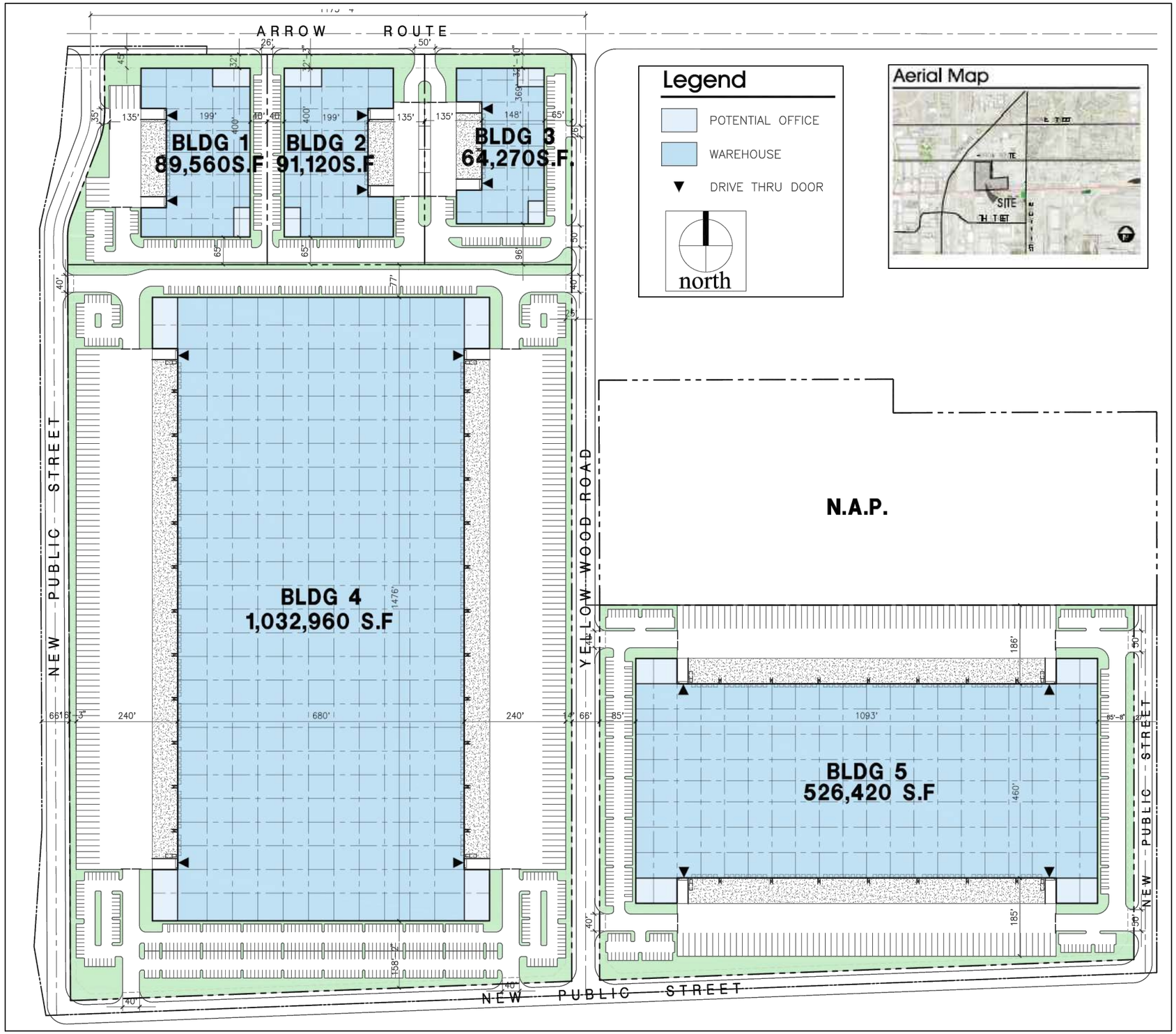
Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 2 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: AS SHOWN	2
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 053_3200.0007L_SITE PLAN.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\053_3200.0007L_SITE PLAN.DWG



NOTES

1. DRAWING ADAPTED FROM CONCEPTUAL SITE PLAN FOR ARROW ROUTE AND JUNEBERRY DRIVE, BY HPA ARCHITECTURE

Title:

PROPOSED DEVELOPMENT PLAN

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

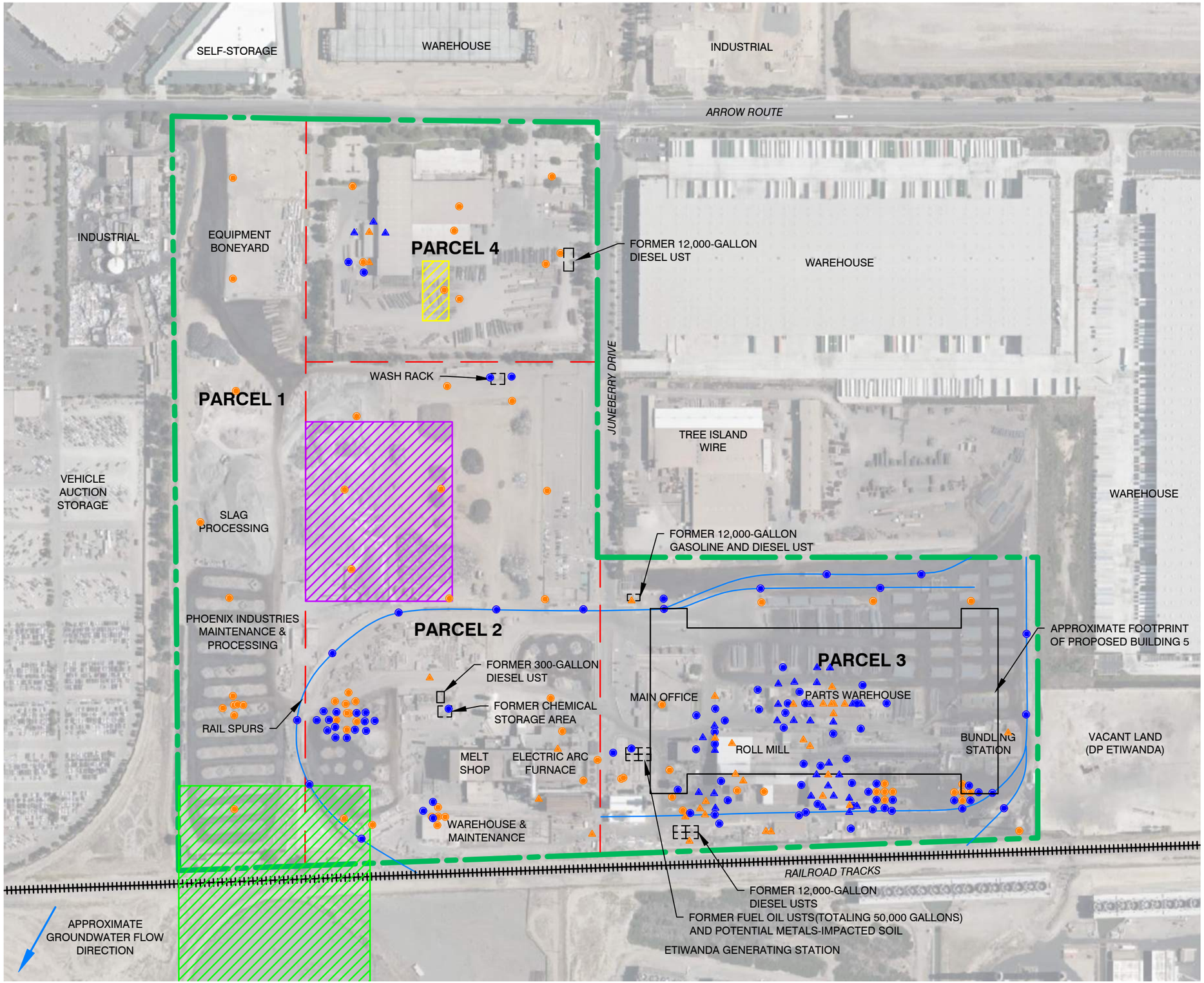
Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: A.P.	Date: 16 NOV 2022	FIGURE
Prepared by: A.P.	Scale: N.T.S.	3
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 051_3200.0007L_PROPOSED DEVELOPMENT PLAN.DWG		

\\SRVLACAFP1\LA SHARED\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\051_3200.0007L_PROPOSED DEVELOPMENT PLAN.DWG



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- SLAG TRENCH REMEDIATION AREA (DTSC, DECEMBER 20, 2001)
- SLAG REMEDIATION AREA (SBCFD, JULY 2, 2002)
- LEAD REMEDIATION AREA (RWQCB-SA, NOVEMBER 7, 1990)
- RAMBOLL BORING LOCATION
- ROUX BORING LOCATION
- RAMROLL SOIL VAPOR BORING LOCATION
- ROUX SOIL VAPOR BORING LOCATION
- APPROXIMATE GROUNDWATER FLOW DIRECTION

N

300' 0 300'

Title:

SAMPLE LOCATIONS

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

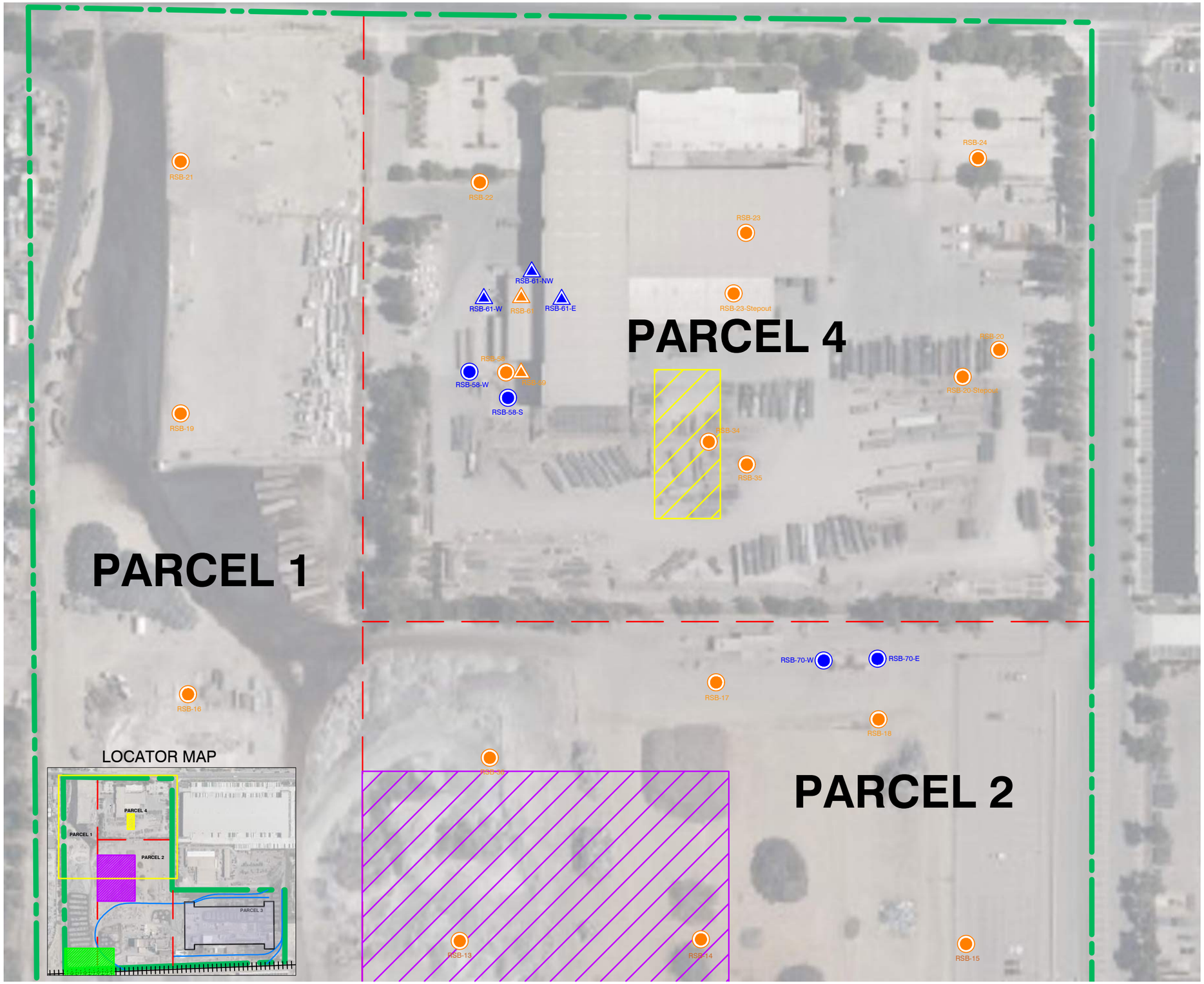
Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 2 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: AS SHOWN	4
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 068_3200.0007L_SOIL AND SV SAMPLING LOCATIONS.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\068_3200.0007L_SOIL AND SV SAMPLING LOCATIONS.DWG



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- PROPOSED BUILDING
- SLAG TRENCH REMEDIATION AREA (DTSC, DECEMBER 20, 2001)
- SLAG REMEDIATION AREA (SBCFD, JULY 2, 2002)
- LEAD REMEDIATION AREA (RWQCB-SA, NOVEMBER 7, 1990)
- RAMBOLL SOIL BORING LOCATION
- RAMBOLL SOIL VAPOR BORING LOCATION
- ROUX SOIL BORING LOCATION
- ROUX SOIL VAPOR BORING LOCATION
- RAIL SPURS

N

120' 0 120'

Title:

SAMPLE LOCATIONS
NORTHWEST PORTION OF SITE

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

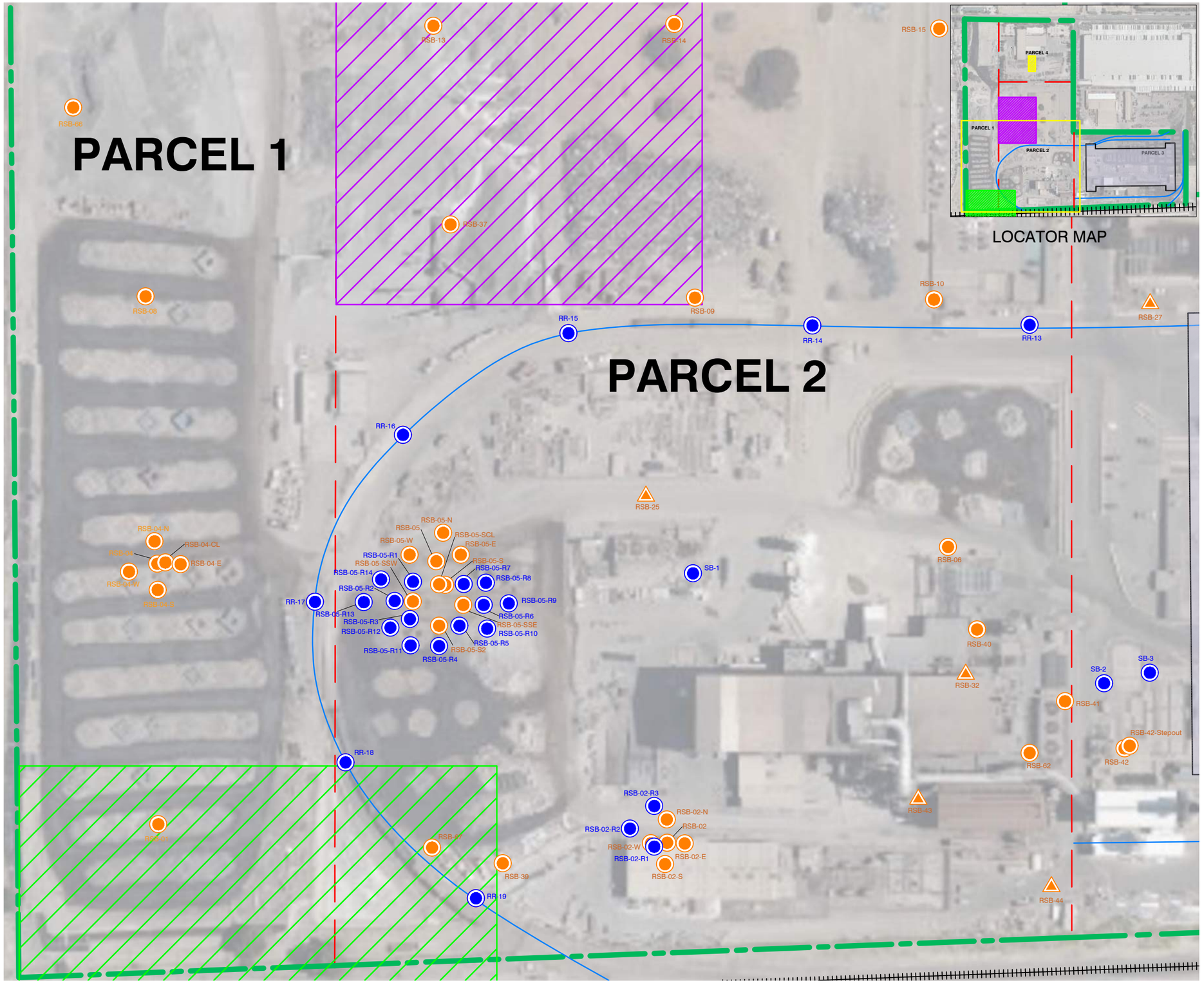
Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 2 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: AS SHOWN	5
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 071_3200.0007L_NORTH PARCELS 1 AND 2 SAMPLING LOCATIONS.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\071_3200.0007L_NORTH PARCELS 1 AND 2 SAMPLING LOCATIONS.DWG



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- PROPOSED BUILDING
- SLAG TRENCH REMEDIATION AREA (DTSC, DECEMBER 20, 2001)
- SLAG REMEDIATION AREA (SBCFD, JULY 2, 2002)
- LEAD REMEDIATION AREA (RWQCB-SA, NOVEMBER 7, 1990)
- RAMBOLL SOIL BORING LOCATION
- RAMBOLL SOIL VAPOR BORING LOCATION
- ROUX SOIL BORING LOCATION
- ROUX SOIL VAPOR BORING LOCATION
- RAIL SPURS

Title:

SAMPLE LOCATIONS
SOUTHWEST PORTION OF SITE

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 2 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: AS SHOWN	6
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 070_3200.0007L_SW SECTION OF SITE SAMPLING LOCATIONS.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\070_3200.0007L_SW SECTION OF SITE SAMPLING LOCATIONS.DWG



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- PROPOSED BUILDING
- SLAG TRENCH REMEDIATION AREA (DTSC, DECEMBER 20, 2001)
- SLAG REMEDIATION AREA (SBCFD, JULY 2, 2002)
- LEAD REMEDIATION AREA (RWQCB-SA, NOVEMBER 7, 1990)
- RAMBOLL SOIL BORING LOCATION
- RAMBOLL SOIL VAPOR BORING LOCATION
- ROUX SOIL BORING LOCATION
- ROUX SOIL VAPOR BORING LOCATION
- RAIL SPURS

N

120' 0 120'

Title:

SAMPLE LOCATIONS SOUTHEAST PORTION OF SITE

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

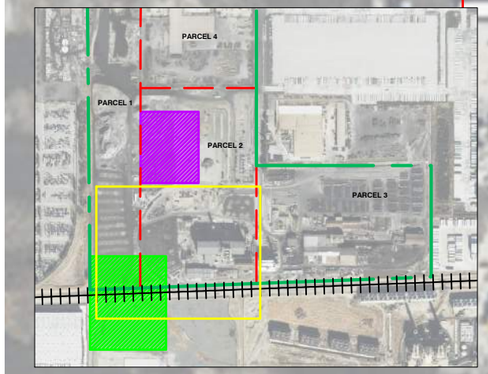
Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 2 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: AS SHOWN	7
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 069_3200.0007L_SE SECTION OF SITE SAMPLING LOCATIONS.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\069_3200.0007L_SE SECTION OF SITE SAMPLING LOCATIONS.DWG



LOCATOR MAP

RSB-05-N
RSB-05-SCL
RSB-05-W
RSB-05-E
RSB-05
RSB-05-S
RSB-05-R1
RSB-05-R7
RSB-05-SSW
RSB-05-R2
RSB-05-R8
RSB-05-S2
RSB-05-SSE
RSB-05-R3
RSB-05-R5
RSB-05-R4

RSB-02-R2	
Depth	Lead
1	**120**
3	**1,700**
5	**5.9**

RSB-02-R3	
Depth	Lead
1	**34**
3	**57**

RSB-02-N*	
Depth	Lead
1	**52.4**
3	**51.0**
5	**4.1**

RSB-02*	
Depth	Lead
1	**10.8**
3	**2,910**
5	**3.3**

RSB-02-R3
RSB-02-N
RSB-02-W
RSB-02-R2
RSB-02-E
RSB-02
RSB-02-S
RSB-02-R1

RSB-02-W*	
Depth	Lead
1	**92.4**
3	**2,040**
5	**5.0**

RSB-02-R1	
Depth	Lead
1	**10**
3	**28**

RSB-02-S*	
Depth	Lead
3	**8.3**
5	**3.6**

RSB-02-E*	
Depth	Lead
1	**91.5**
3	**8.3**
5	**3.6**

LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- SLAG REMEDIATION AREA (SBCFD, JULY 2, 2002)
- LEAD REMEDIATION AREA (RWQCB-SA, NOVEMBER 7, 1990)
- RSB-09 — BORING LOCATION (RAMBOLL 2020/2021)
- RSB-02-R2 — SHALLOW SOIL BORING - LEAD ANALYSIS (ROUX 2021)
- RSB-02 — LEAD EXCEEDANCE IN SOIL (RAMBOLL 2020/2021)
- RSB-05-R7 — SHALLOW SOIL BORING - TPH-D ANALYSIS (ROUX 2021)
- RSB-05 — TPH-D EXCEEDANCE IN SOIL (RAMBOLL 2020/2021)

NOTES

1. DEPTH IS IF FEET BELOW GROUND SURFACE (BGS)
2. LEAD MEASURED IN UNITS OF MILLIGRAMS PER KILOGRAM (MG/KG)
3. ORANGE HIGHLIGHT INDICATES RESULTS EXCEED ONE OR BOTH SCREENING LEVELS
4. CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) INDUSTRIAL SOIL SCREENING LEVEL FOR LEAD IS 500 MG/KG
5. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) INDUSTRIAL SOIL SCREENING LEVEL FOR LEAD IS 800 MG/KG
3. GREEN HIGHLIGHT INDICATES DATA SET INCLUDES SAMPLES COLLECTED BY RAMBOLL
4. * = ALL SAMPLES WERE TAKEN BY RAMBOLL IN 2020/2021

N

100' 0 100'

Title:

PARCEL 2 - LEAD IN SOIL

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

Prepared for:

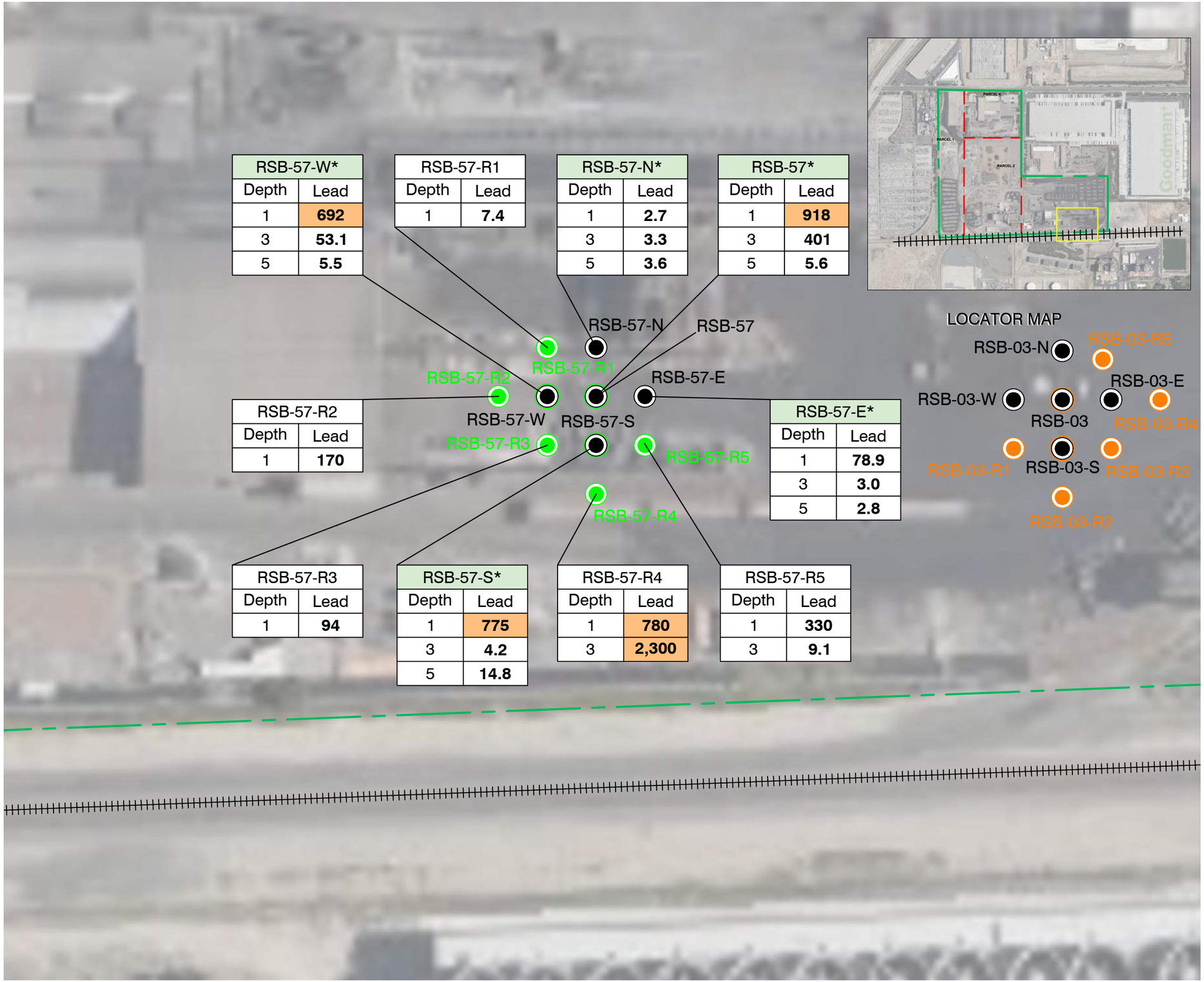
BTC III ARROW ROUTE CC LP

ROUX

Compiled by: A.P.	Date: 2 MARCH 2023
Prepared by: M.B.	Scale: AS SHOWN
Project Mgr: M.J.N.	Project: 3200.0007L
File: 015_3200.0007L_PARCEL 2 LEAD DATA.DWG	

FIGURE 8

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\015_3200.0007L_PARCEL 2 LEAD DATA.DWG



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- RSB-57 — BORING LOCATION (RAMBOLL 2020/2021)
- RSB-57-3 — SHALLOW SOIL BORING (ROUX 2021)
- RSB-57S — LEAD EXCEEDANCE IN SOIL (RAMBOLL 2020/2021)
- RSB-03-R1 — SHALLOW SOIL BORING (ROUX 2021)
- RSB-03-S — TPH-D EXCEEDANCE IN SOIL (RAMBOLL 2020/2021)

NOTES

1. DEPTH IS IF FEET BELOW GROUND SURFACE (BGS)
2. LEAD MEASURED IN UNITS OF MILLIGRAMS PER KILOGRAM (MG/KG)
3. ORANGE HIGHLIGHT INDICATES RESULTS EXCEED ONE OR BOTH SCREENING LEVELS
4. CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) INDUSTRIAL SOIL SCREENING LEVEL FOR LEAD IS 500 MG/KG
5. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) INDUSTRIAL SOIL SCREENING LEVEL FOR LEAD IS 800 MG/KG
3. GREEN HIGHLIGHT INDICATES DATA SET INCLUDES SAMPLES COLLECTED BY RAMBOLL
4. * = ALL SAMPLES WERE TAKEN BY RAMBOLL IN 2020/2021

N

50' 0 50'

Title:
SOUTHERN PORTION OF PARCEL 3 LEAD IN SOIL

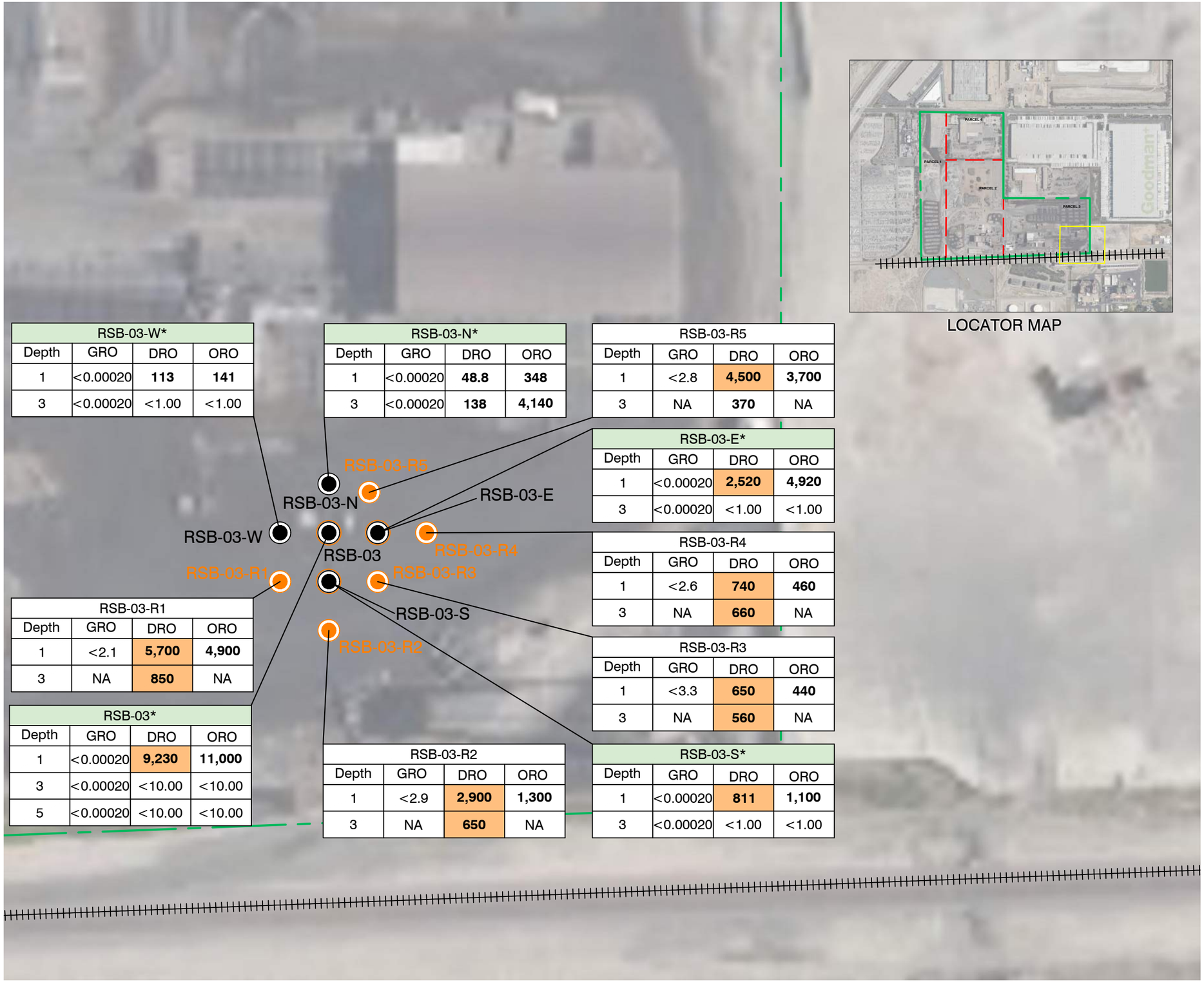
12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

Prepared for:
BTC III ARROW ROUTE CC LP

ROUX

Compiled by: A.P.	Date: 2 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: AS SHOWN	9
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 012_3200.0007L_SOUTHERN PORTION OF PARCEL 3 LEAD IN SOIL.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\012_3200.0007L_SOUTHERN PORTION OF PARCEL 3 LEAD IN SOIL.DWG



RSB-03-W*			
Depth	GRO	DRO	ORO
1	<0.00020	**113**	**141**
3	<0.00020	<1.00	<1.00

RSB-03-N*			
Depth	GRO	DRO	ORO
1	<0.00020	**48.8**	**348**
3	<0.00020	**138**	**4,140**

RSB-03-R5			
Depth	GRO	DRO	ORO
1	<2.8	**4,500**	**3,700**
3	NA	**370**	NA

RSB-03-E*			
Depth	GRO	DRO	ORO
1	<0.00020	**2,520**	**4,920**
3	<0.00020	<1.00	<1.00

RSB-03-R4			
Depth	GRO	DRO	ORO
1	<2.6	**740**	**460**
3	NA	**660**	NA

RSB-03-R1			
Depth	GRO	DRO	ORO
1	<2.1	**5,700**	**4,900**
3	NA	**850**	NA

RSB-03-R3			
Depth	GRO	DRO	ORO
1	<3.3	**650**	**440**
3	NA	**560**	NA

RSB-03*			
Depth	GRO	DRO	ORO
1	<0.00020	**9,230**	**11,000**
3	<0.00020	<10.00	<10.00
5	<0.00020	<10.00	<10.00

RSB-03-R2			
Depth	GRO	DRO	ORO
1	<2.9	**2,900**	**1,300**
3	NA	**650**	NA

RSB-03-S*			
Depth	GRO	DRO	ORO
1	<0.00020	**811**	**1,100**
3	<0.00020	<1.00	<1.00

LOCATOR MAP

LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- RSB-03-W — BORING LOCATION (RAMBOLL 2020/2021)
- RSB-03-R1 — SHALLOW SOIL BORING (ROUX 2021)
- RSB-03-S — TPH-d EXCEEDANCE IN SOIL (RAMBOLL 2020/2021)

NOTES

1. DEPTH IS IF FEET BELOW GROUND SURFACE (BGS)
2. GRO = TOTAL PETROLEUM HYDROCARBONS IN THE GASOLINE RANGE
3. DRO = TOTAL PETROLEUM HYDROCARBONS IN THE DIESEL RANGE
4. ORO = TOTAL PETROLEUM HYDROCARBONS IN THE OIL RANGE
5. TPH MEASURED IN UNITS OF MILLIGRAMS PER KILOGRAM (MG/KG)
6. ORANGE HIGHLIGHT INDICATES RESULTS EXCEED THE SCREENING LEVELS
7. CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) HUMAN AND ECOLOGICAL RISK OFFICE (HERO) HUMAN HEALTH RISK ASSESSMENT (HHRA) NOTE 3 INDUSTRIAL SOIL SCREENING LEVEL FOR GRO IS NOT SPECIFIED, FOR DRO IS 500 MG/KG, AND FOR ORO IS 18,000 MG/KG
8. <X = ANALYTE NOT DETECTED ABOVE LABORATORY REPORTING LEVEL
9. NA = NOT ANALYZED
10. GREEN HIGHLIGHT INDICATES DATA SET INCLUDES SAMPLES COLLECTED BY RAMBOLL
11. * = ALL SAMPLES WERE TAKEN BY RAMBOLL IN 2020/2021

N

50' 0 50'

Title: **SOUTHERN PORTION OF PARCEL 3 - TPH IN SOIL**

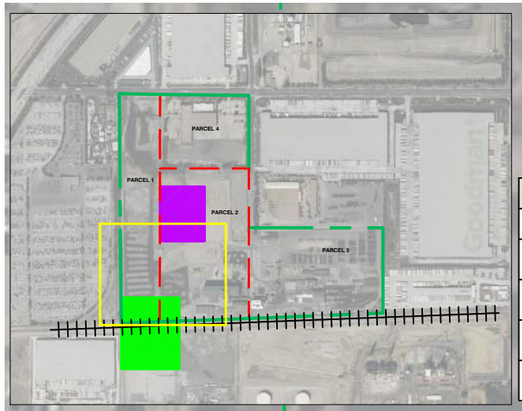
12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

Prepared for:
BTC III ARROW ROUTE CC LP

ROUX

Compiled by: A.MOK	Date: 2 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: AS SHOWN	10
Project Mgr: R.Q.	Project: 3200.0007L	
File: 013_3200.0007L_SOUTHERN PORTION OF PARCEL 3 SOIL BORINGS WITH TPH.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\013_3200.0007L_SOUTHERN PORTION OF PARCEL 3 SOIL BORINGS WITH TPH.DWG



LOCATOR MAP

PARCEL 1

RSB-05-SCL*			
Depth	GRO	DRO	ORO
0.5	NA	<10.0	NA
1	NA	<10.0	NA
3	NA	<10.0	NA
5	NA	<10.0	NA

RSB-05-W*			
Depth	GRO	DRO	ORO
1	<0.00020	<1.0	<1.0
3	<0.00020	<1.0	<1.0

RSB-05-R1			
Depth	GRO	DRO	ORO
1	<2.6	**2,300**	**850**
3	NA	<10	NA

RSB-05-R2			
Depth	GRO	DRO	ORO
1	<2.4	**2,200**	**1,300**
3	NA	<10	NA

RSB-05-SSW*			
Depth	GRO	DRO	ORO
0.5	NA	**1,800**	NA
1	NA	<10.0	NA
3	NA	<10.0	NA
5	NA	<10.0	NA

RSB-05-R3			
Depth	GRO	DRO	ORO
1	<3.0	**1,000**	350
3	NA	<10	NA

RSB-05-S2*			
Depth	GRO	DRO	ORO
0.5	NA	**7,590**	NA
1	NA	<10.0	NA
3	NA	<10.0	NA
5	NA	<10.0	NA

RSB-05*			
Depth	GRO	DRO	ORO
1	<0.00020	**2,210**	**1,810**
3	<0.00020	<1.0	<1.0
5	<0.00020	<1.0	<1.0

PARCEL 2

RSB-05-N*			
Depth	GRO	DRO	ORO
3	<0.00020	<1.0	<1.0

RSB-05-E*			
Depth	GRO	DRO	ORO
1	<0.00020	<1.0	<1.0
3	<0.00020	<1.0	<1.0

RSB-05-S*			
Depth	GRO	DRO	ORO
1	<0.00020	**672**	**607**
3	<0.00020	**6,000**	**7,310**

RSB-05-R7			
Depth	GRO	DRO	ORO
1	<2.5	**52**	**19**

RSB-05-R6			
Depth	GRO	DRO	ORO
1	<2.2	**3,100**	**2,200**

RSB-05-SSE*			
Depth	GRO	DRO	ORO
0.5	NA	**1,040**	NA
1	NA	<10.0	NA
3	NA	<10.0	NA
5	NA	<10.0	NA

RSB-05-R5			
Depth	GRO	DRO	ORO
1	<3.2	**440**	<10

RSB-05-R4			
Depth	GRO	DRO	ORO
1	<2.9	<10	<10

RSB-05
RSB-05-N
RSB-05-E
RSB-05-SCL
RSB-05-W
RSB-05-S
RSB-05-R1
RSB-05-R7
RSB-05-R2
RSB-05-R6
RSB-05-SSE
RSB-05-R5
RSB-05-SSW
RSB-05-S2
RSB-05-R3
RSB-05-R4

LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- SLAG REMEDIATION AREA (SBCFD, JULY 2, 2002)
- LEAD REMEDIATION AREA (RWQCB-SA, NOVEMBER 7, 1990)
- RSB-09 — BORING LOCATION (RAMBOLL 2020/2021)
- RSB-05-R7 — SHALLOW SOIL BORING - TPH-D ANALYSIS (ROUX 2021)
- RSB-05 — TPH-D EXCEEDANCE IN SOIL (RAMBOLL 2020/2021)

NOTES

1. DEPTH IS IF FEET BELOW GROUND SURFACE (BGS)
2. GRO = TOTAL PETROLEUM HYDROCARBONS IN THE GASOLINE RANGE
3. DRO = TOTAL PETROLEUM HYDROCARBONS IN THE DIESEL RANGE
4. ORO = TOTAL PETROLEUM HYDROCARBONS IN THE OIL RANGE
5. TPH MEASURED IN UNITS OF MILLIGRAMS PER KILOGRAM (MG/KG)
6. ORANGE HIGHLIGHT INDICATES RESULTS EXCEED THE SCREENING LEVEL
7. CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) HUMAN AND ECOLOGICAL RISK OFFICE (HERO) HUMAN HEALTH RISK ASSESSMENT (HHRA) NOTE 3 INDUSTRIAL SOIL SCREENING LEVEL FOR GRO IS NOT SPECIFIED, FOR DRO IS 500 MG/KG, AND FOR ORO IS 18,000 MG/KG
8. <X = ANALYTE NOT DETECTED ABOVE LABORATORY REPORTING LEVEL
9. NA = NOT ANALYZED
10. GREEN HIGHLIGHT INDICATES DATA SET INCLUDES SAMPLES COLLECTED BY RAMBOLL
11. * = ALL SAMPLES WERE TAKEN BY RAMBOLL IN 2020/2021

N

100' 0 100'

Title:

PARCEL 2 - TPH IN SOIL

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

Prepared for:

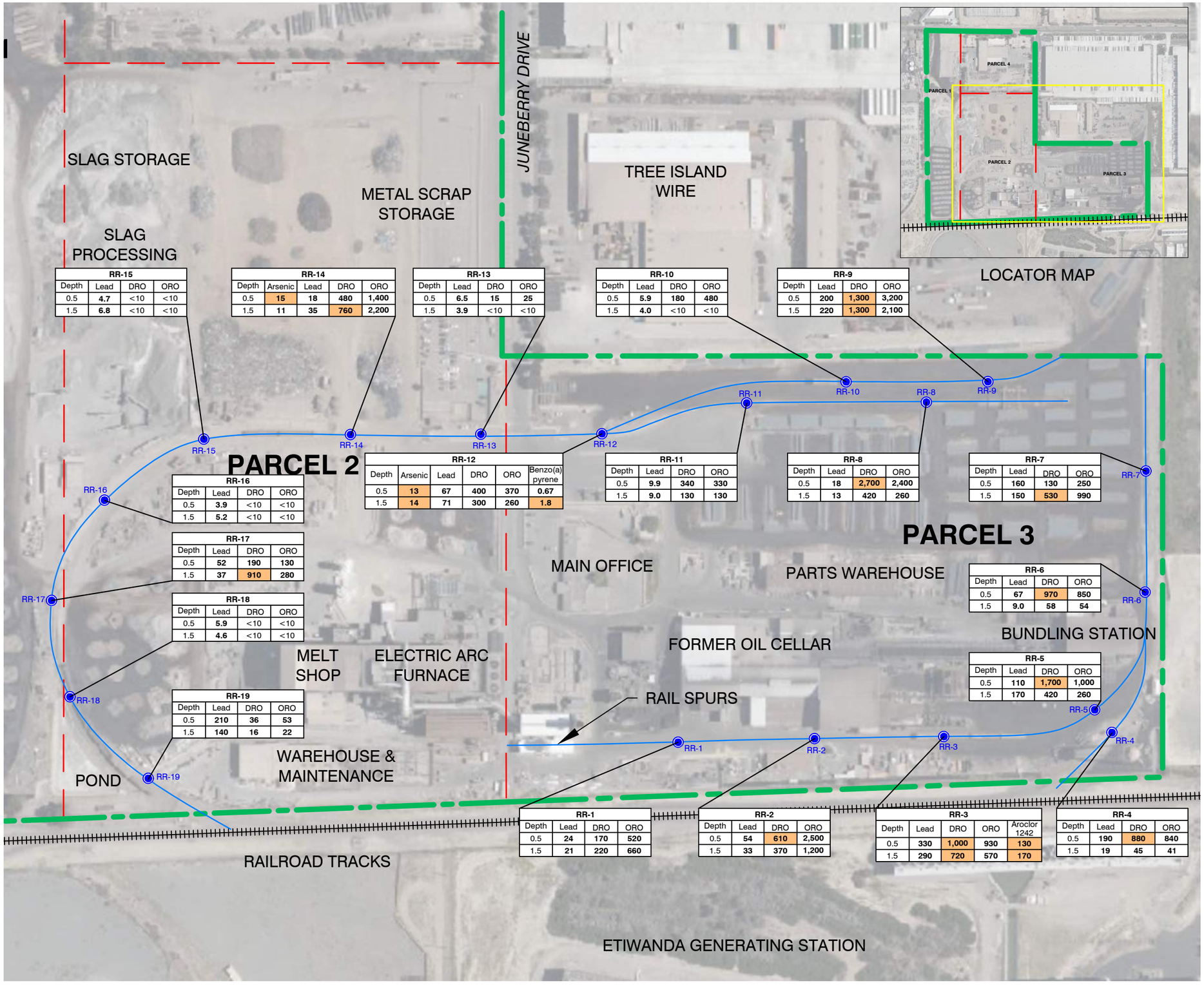
BTC III ARROW ROUTE CC LP

ROUX

Compiled by: A.P.	Date: 6 MARCH 2023
Prepared by: M.B.	Scale: AS SHOWN
Project Mgr: M.J.N.	Project: 3200.0007L
File: 014_3200.0007L_PARCEL 2 TPH DATA.DWG	

FIGURE 11

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\014_3200.0007L_PARCEL 2 TPH DATA.DWG



RR-15			
Depth	Lead	DRO	ORO
0.5	**4.7**	<10	<10
1.5	**6.8**	<10	<10

RR-14				
Depth	Arsenic	Lead	DRO	ORO
0.5	**15**	**18**	**480**	**1,400**
1.5	**11**	**35**	**760**	**2,200**

RR-13			
Depth	Lead	DRO	ORO
0.5	**6.5**	**15**	**25**
1.5	**3.9**	<10	<10

RR-10			
Depth	Lead	DRO	ORO
0.5	**5.9**	**180**	**480**
1.5	**4.0**	<10	<10

RR-9			
Depth	Lead	DRO	ORO
0.5	**200**	**1,300**	**3,200**
1.5	**220**	**1,300**	**2,100**

RR-16			
Depth	Lead	DRO	ORO
0.5	**3.9**	<10	<10
1.5	**5.2**	<10	<10

RR-12					
Depth	Arsenic	Lead	DRO	ORO	Benzo(a) pyrene
0.5	**13**	**67**	**400**	**370**	**0.67**
1.5	**14**	**71**	**300**	**260**	**1.8**

RR-11			
Depth	Lead	DRO	ORO
0.5	**9.9**	**340**	**330**
1.5	**9.0**	**130**	**130**

RR-8			
Depth	Lead	DRO	ORO
0.5	**18**	**2,700**	**2,400**
1.5	**13**	**420**	**260**

RR-7			
Depth	Lead	DRO	ORO
0.5	**160**	**130**	**250**
1.5	**150**	**530**	**990**

RR-17			
Depth	Lead	DRO	ORO
0.5	**52**	**190**	**130**
1.5	**37**	**910**	**280**

RR-18			
Depth	Lead	DRO	ORO
0.5	**5.9**	<10	<10
1.5	**4.6**	<10	<10

RR-19			
Depth	Lead	DRO	ORO
0.5	**210**	**36**	**53**
1.5	**140**	**16**	**22**

RR-6			
Depth	Lead	DRO	ORO
0.5	**67**	**970**	**850**
1.5	**9.0**	**58**	**54**

RR-5			
Depth	Lead	DRO	ORO
0.5	**110**	**1,700**	**1,000**
1.5	**170**	**420**	**260**

RR-1			
Depth	Lead	DRO	ORO
0.5	**24**	**170**	**520**
1.5	**21**	**220**	**660**

RR-2			
Depth	Lead	DRO	ORO
0.5	**54**	**610**	**2,500**
1.5	**33**	**370**	**1,200**

RR-3				
Depth	Lead	DRO	ORO	Aroclor 1242
0.5	**330**	**1,000**	**930**	**130**
1.5	**290**	**720**	**570**	**170**

RR-4			
Depth	Lead	DRO	ORO
0.5	**190**	**880**	**840**
1.5	**19**	**45**	**41**

LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARIES
- RAIL SPURS
- RR-1 RAIL SPUR SOIL SAMPLE LOCATIONS (ROUX, 2021)

NOTES

1. DEPTH IS IN FEET BELOW GROUND SURFACE (BGS)
2. TPH-d = TOTAL PETROLEUM HYDROCARBONS AS DIESEL
3. TPH-o = TOTAL PETROLEUM HYDROCARBONS AS OIL
4. CONCENTRATIONS ARE IN UNITS OF MILLIGRAMS PER KILOGRAM (MG/KG)
5. ORANGE HIGHLIGHT INDICATE RESULTS EXCEED SCREENING LEVELS
6. CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES (DTSC) HUMAN AND ECOLOGICAL RISK OFFICE (HERO) HUMAN HEALTH RISK ASSESSMENT (HHRA) NOTE 3 INDUSTRIAL SCREENING LEVEL FOR LEAD IS 500 MG/KG, FOR TPH-d IS 500 MG/KG, AND FOR TPH-o IS 18,000 MG/KG
7. <X = ANALYTE NOT DETECTED ABOVE LABORATORY REPORTING LIMIT

N

200' 0 200'

Title:

RAIL SPURS PARCELS 2 AND 3 EXCEEDANCES IN SOIL

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

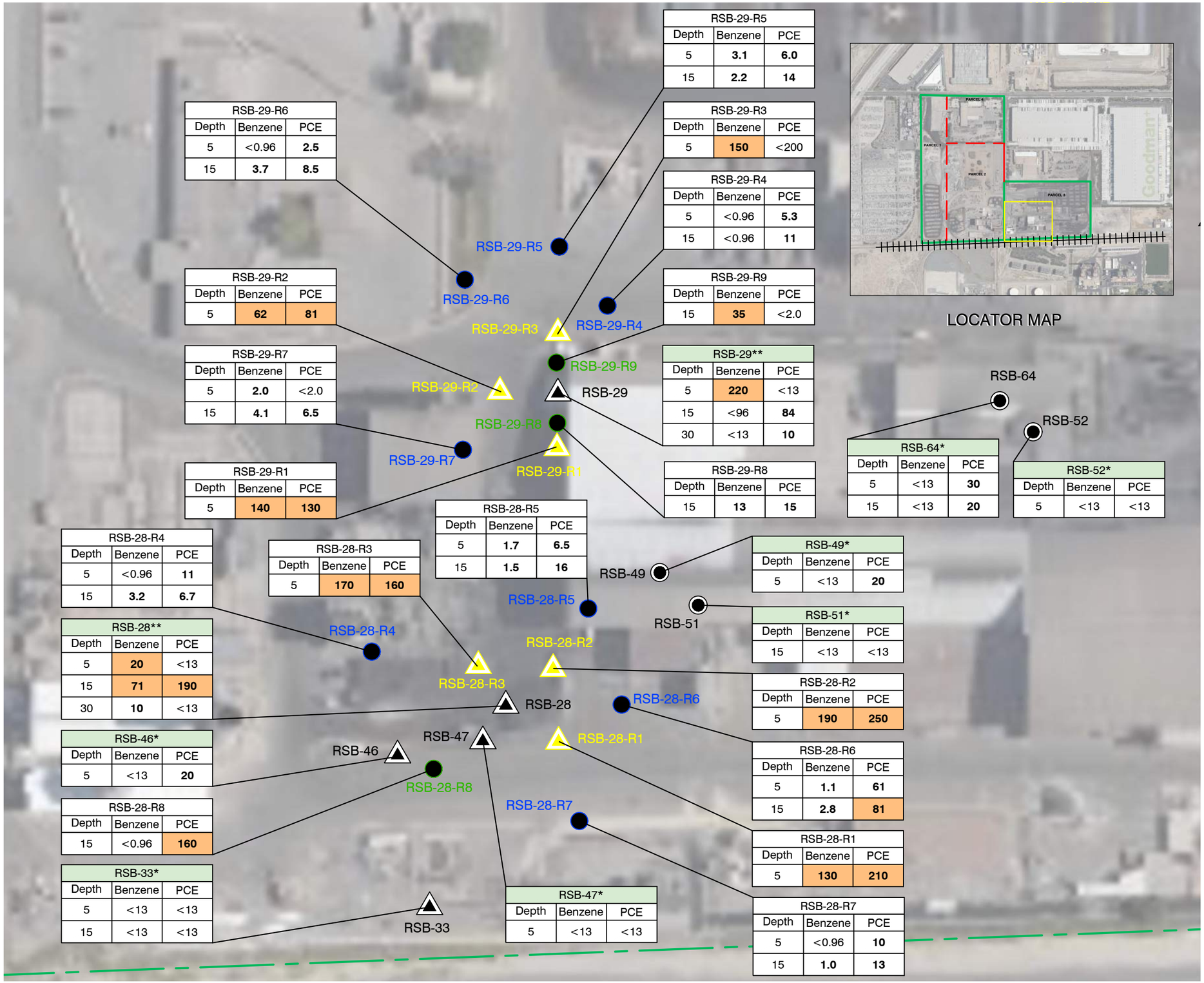
Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 2 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: AS SHOWN	12
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 074_3200.0007L_RAIL SPUR WITH LEAD AND TPH.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\074_3200.0007L_RAIL SPUR WITH LEAD AND TPH.DWG



RSB-29-R5		
Depth	Benzene	PCE
5	**3.1**	**6.0**
15	**2.2**	**14**

RSB-29-R6		
Depth	Benzene	PCE
5	<0.96	**2.5**
15	**3.7**	**8.5**

RSB-29-R3		
Depth	Benzene	PCE
5	**150**	<200

RSB-29-R4		
Depth	Benzene	PCE
5	<0.96	**5.3**
15	<0.96	**11**

RSB-29-R2		
Depth	Benzene	PCE
5	**62**	**81**

RSB-29-R9		
Depth	Benzene	PCE
15	**35**	<2.0

RSB-29-R7		
Depth	Benzene	PCE
5	**2.0**	<2.0
15	**4.1**	**6.5**

RSB-29**		
Depth	Benzene	PCE
5	**220**	<13
15	<96	**84**
30	<13	**10**

RSB-29-R1		
Depth	Benzene	PCE
5	**140**	**130**

RSB-29-R8		
Depth	Benzene	PCE
15	**13**	**15**

RSB-28-R5		
Depth	Benzene	PCE
5	**1.7**	**6.5**
15	**1.5**	**16**

RSB-28-R4		
Depth	Benzene	PCE
5	<0.96	**11**
15	**3.2**	**6.7**

RSB-28-R3		
Depth	Benzene	PCE
5	**170**	**160**

RSB-49*		
Depth	Benzene	PCE
5	<13	**20**

RSB-51*		
Depth	Benzene	PCE
15	<13	<13

RSB-28**		
Depth	Benzene	PCE
5	**20**	<13
15	**71**	**190**
30	**10**	<13

RSB-28-R2		
Depth	Benzene	PCE
5	**190**	**250**

RSB-46*		
Depth	Benzene	PCE
5	<13	**20**

RSB-28-R6		
Depth	Benzene	PCE
5	**1.1**	**61**
15	**2.8**	**81**

RSB-28-R8		
Depth	Benzene	PCE
15	<0.96	**160**

RSB-28-R1		
Depth	Benzene	PCE
5	**130**	**210**

RSB-33*		
Depth	Benzene	PCE
5	<13	<13
15	<13	<13

RSB-47*		
Depth	Benzene	PCE
5	<13	<13

RSB-28-R7		
Depth	Benzene	PCE
5	<0.96	**10**
15	**1.0**	**13**

RSB-64*		
Depth	Benzene	PCE
5	<13	**30**
15	<13	**20**

RSB-52*		
Depth	Benzene	PCE
5	<13	<13

LOCATOR MAP

LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- RSB-57 — BORING LOCATION (RAMBOLL 2020/2021)
- RSB-54 — SOIL VAPOR LOCATION (RAMBOLL 2020/2021)
- RSB-26-R1 — SOIL VAPOR PROBE (ROUX 2021)
- RSB-53-R11 — DUAL-NESTED SOIL VAPOR PROBE - 5, 15 FEET BGS (ROUX 2022)
- RSB-29-R5 — SOIL VAPOR PROBE - 15 FEET BGS (ROUX 2022)

NOTES

1. DEPTH IS IN FEET BELOW GROUND SURFACE (BGS)
2. PCE = TETRACHLOROETHENE
3. BENZENE AND PCE MEASURED IN UNITS OF MICROGRAMS PER CUBIC METER (UG/M^3)
4. ORANGE HIGHLIGHT INDICATES RESULTS EXCEED ONE OR BOTH SCREENING LEVELS
3. CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) COMMERCIAL/INDUSTRIAL INDOOR AIR SCREENING LEVEL WITH AN ATTENUATION FACTOR OF 0.03 FOR BENZENE IS 14 UG/M^3 AND FOR PCE IS 67 UG/M^3
4. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) INDUSTRIAL INDOOR AIR REGIONAL SCREENING LEVEL WITH AN ATTENUATION FACTOR OF 0.03 FOR BENZENE IS 57 UG/M^3 AND NO ESTABLISHED SCREENING LEVEL FOR PCE
5. <X = ANALYTE NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
6. GREEN HIGHLIGHT INDICATES DATA SET INCLUDES SAMPLES COLLECTED BY RAMBOLL
7. * = ALL SAMPLES WERE COLLECTED BY RAMBOLL IN 2020/2021
8. ** = 5 FOOT AND 30 FOOT SAMPLES WERE COLLECTED BY RAMBOLL IN 2020/2021, 15 FOOT SAMPLE WAS COLLECTED BY ROUX

N

60' 0 60'

Title:
SOUTHWESTERN PORTION OF PARCEL 3 PCE & BENZENE IN SOIL VAPOR

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

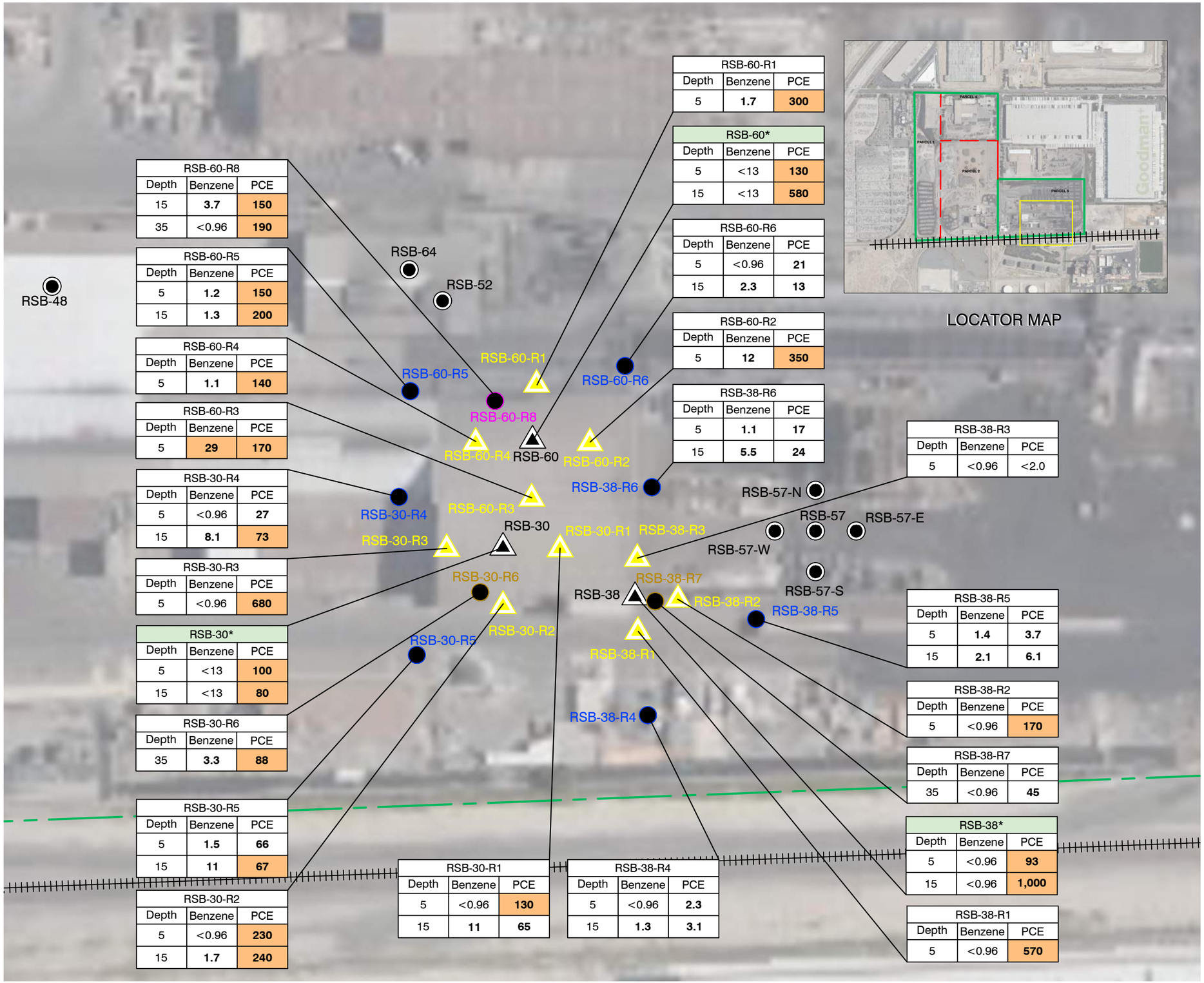
Prepared for:
BTC III ARROW ROUTE CC LP

ROUX

Compiled by: A.P.	Date: 7 MARCH 2023
Prepared by: M.B.	Scale: 1" = 60'
Project Mgr: M.J.N	Project: 3200.0007L
File: 031_3200.0007L_SW PORTION OF PARCEL 3 PCE & BENZENE.DWG	

FIGURE 13

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\031_3200.0007L_SW PORTION OF PARCEL 3 PCE & BENZENE.DWG



RSB-60-R8		
Depth	Benzene	PCE
15	**3.7**	**150**
35	<0.96	**190**

RSB-60-R5		
Depth	Benzene	PCE
5	**1.2**	**150**
15	**1.3**	**200**

RSB-60-R4		
Depth	Benzene	PCE
5	**1.1**	**140**

RSB-60-R3		
Depth	Benzene	PCE
5	**29**	**170**

RSB-30-R4		
Depth	Benzene	PCE
5	<0.96	**27**
15	**8.1**	**73**

RSB-30-R3		
Depth	Benzene	PCE
5	<0.96	**680**

RSB-30*		
Depth	Benzene	PCE
5	<13	**100**
15	<13	**80**

RSB-30-R6		
Depth	Benzene	PCE
35	**3.3**	**88**

RSB-30-R5		
Depth	Benzene	PCE
5	**1.5**	**66**
15	**11**	**67**

RSB-30-R2		
Depth	Benzene	PCE
5	<0.96	**230**
15	**1.7**	**240**

RSB-60-R1		
Depth	Benzene	PCE
5	**1.7**	**300**

RSB-60*		
Depth	Benzene	PCE
5	<13	**130**
15	<13	**580**

RSB-60-R6		
Depth	Benzene	PCE
5	<0.96	**21**
15	**2.3**	**13**

RSB-60-R2		
Depth	Benzene	PCE
5	**12**	**350**

RSB-38-R6		
Depth	Benzene	PCE
5	**1.1**	**17**
15	**5.5**	**24**

RSB-30-R1		
Depth	Benzene	PCE
5	<0.96	**130**
15	**11**	**65**

RSB-38-R4		
Depth	Benzene	PCE
5	<0.96	**2.3**
15	**1.3**	**3.1**

RSB-38-R3		
Depth	Benzene	PCE
5	<0.96	<2.0

RSB-38-R5		
Depth	Benzene	PCE
5	**1.4**	**3.7**
15	**2.1**	**6.1**

RSB-38-R2		
Depth	Benzene	PCE
5	<0.96	**170**

RSB-38-R7		
Depth	Benzene	PCE
35	<0.96	**45**

RSB-38*		
Depth	Benzene	PCE
5	<0.96	**93**
15	<0.96	**1,000**

RSB-38-R1		
Depth	Benzene	PCE
5	<0.96	**570**

LOCATOR MAP

LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- RSB-57 — BORING LOCATION (RAMBOLL 2020/2021)
- RSB-54 — SOIL VAPOR LOCATION (RAMBOLL 2020/2021)
- RSB-54-E — ROUX 2021 STEP OUT SOIL VAPOR LOCATION FOR VOC ANALYSIS
- RSB-53-R11 — DUAL-NESTED SOIL VAPOR PROBE - 5, 15 FEET BGS (ROUX 2022)
- RSB-60-R8 — DUAL-NESTED SOIL VAPOR PROBE - 15, 35 FEET BGS (ROUX 2022)
- RSB-30-R6 — SOIL VAPOR PROBE - 35 FEET BGS (ROUX 2022)

NOTES

1. DEPTH IS IN FEET BELOW GROUND SURFACE (BGS)
2. PCE = TETRACHLOROETHENE
3. PCE AND BENZENE MEASURED IN UNITS OF MICROGRAMS PER CUBIC METER (UG/M^3)
4. ORANGE HIGHLIGHT INDICATES RESULTS EXCEED ONE OR BOTH SCREENING LEVELS
5. CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) COMMERCIAL/INDUSTRIAL INDOOR AIR SCREENING LEVEL WITH AN ATTENUATION FACTOR OF 0.03 FOR BENZENE IS 14 UG/M^3 AND FOR PCE IS 67 UG/M^3
6. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) INDUSTRIAL INDOOR AIR REGIONAL SCREENING LEVEL WITH AN ATTENUATION FACTOR OF 0.03 FOR BENZENE IS 53 UG/M^3 AND NO ESTABLISHED SCREENING LEVEL FOR PCE
7. <X = ANALYTE NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
8. GREEN HIGHLIGHT INDICATES DATA COLLECTED BY RAMBOLL
9. * = 5 FOOT SAMPLE WAS COLLECTED BY RAMBOLL IN 2020/2021, 15 FOOT SAMPLE WAS COLLECTED BY ROUX IN 2021

N

60' 0 60'

Title:

SOUTHERN PORTION OF PARCEL 3 PCE AND BENZENE IN SOIL VAPOR

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

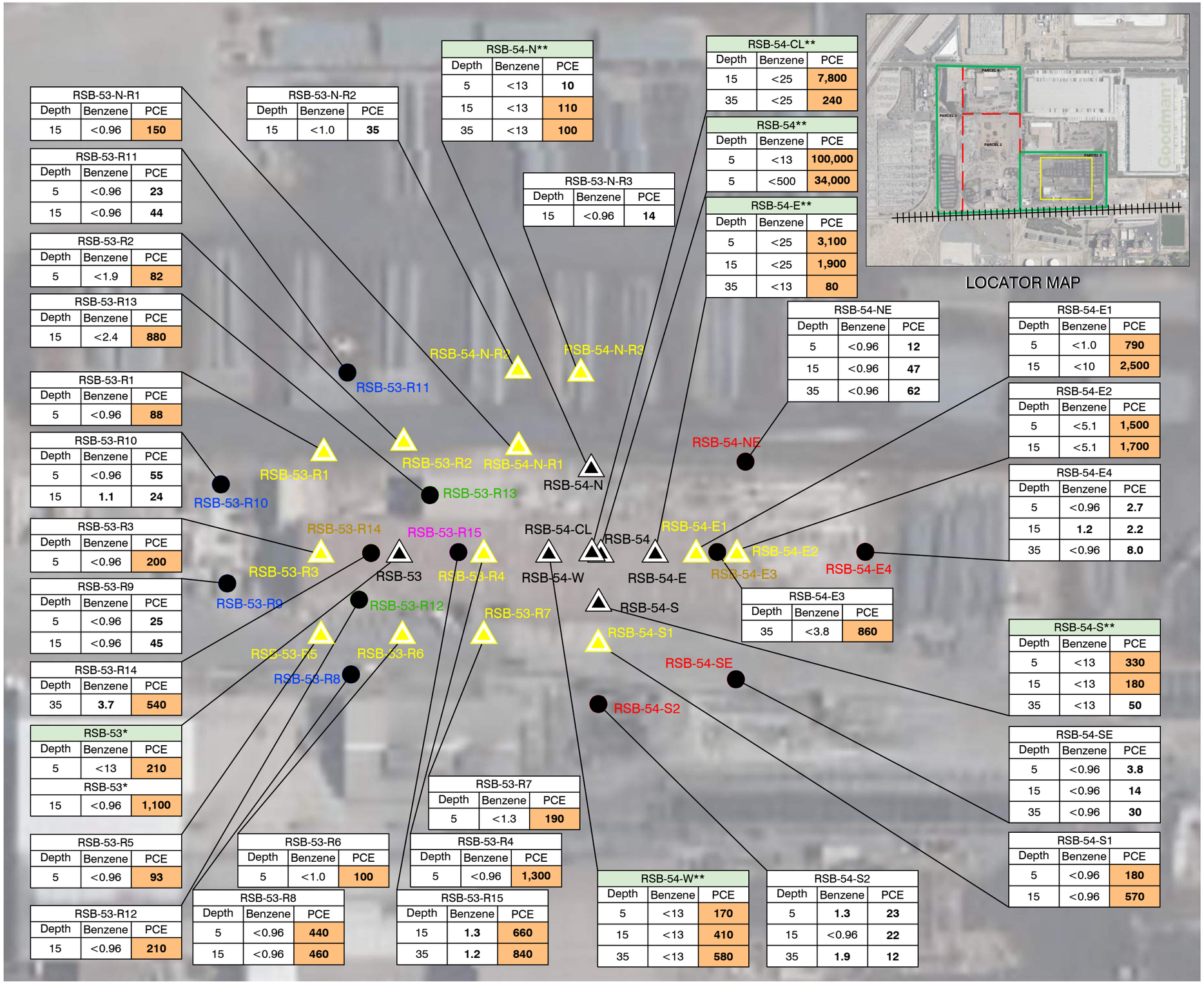
Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 9 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: 1" = 60'	14
Project Mgr: M.J.N	Project: 3200.0007L	
File: 033_3200.0007L_SOUTHERN PORTION OF PARCEL 3 PCE & BENZENE.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\033_3200.0007L_SOUTHERN PORTION OF PARCEL 3 PCE & BENZENE.DWG



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- RSB-54 — SOIL VAPOR LOCATION (RAMBOLL 2020/2021)
- RSB-54-E — ROUX 2021 STEP OUT SOIL VAPOR LOCATION FOR VOC ANALYSIS
- RSB-54-NE — TRIPLE-NESTED SOIL VAPOR PROBE - 5, 10, 35 FEET BGS (ROUX 2022)
- RSB-53-R11 — DUAL-NESTED SOIL VAPOR PROBE - 5, 15 FEET BGS (ROUX 2022)
- RSB-60-R8 — DUAL-NESTED SOIL VAPOR PROBE - 15, 35 FEET BGS (ROUX 2022)
- RSB-29-R5 — SOIL VAPOR PROBE - 15 FEET BGS (ROUX 2022)
- RSB-30-R6 — SOIL VAPOR PROBE - 35 FEET BGS (ROUX 2022)

NOTES

1. DEPTH IS IN FEET BELOW GROUND SURFACE (BGS)
2. PCE = TETRACHLOROETHENE
3. PCE AND BENZENE MEASURED IN UNITS OF MICROGRAMS PER CUBIC METER (UG/M^3)
4. ORANGE HIGHLIGHT INDICATES RESULTS EXCEED ONE OR BOTH SCREENING LEVELS
5. CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) COMMERCIAL/INDUSTRIAL INDOOR AIR SCREENING LEVEL WITH AN ATTENUATION FACTOR OF 0.03 FOR BENZENE IS 14 UG/M^3 AND FOR PCE IS 67 UG/M^3
6. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) INDUSTRIAL INDOOR AIR REGIONAL SCREENING LEVEL WITH AN ATTENUATION FACTOR OF 0.03 FOR BENZENE IS 53 UG/M^3 AND NO ESTABLISHED SCREENING LEVEL FOR PCE
7. <X = ANALYTE NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
8. GREEN HIGHLIGHT INDICATES DATA COLLECTED BY RAMBOLL
9. * = 5 FOOT SAMPLE WAS TAKEN BY RAMBOLL IN 2020/2021, 15 FOOT SAMPLE WAS TAKEN BY ROUX IN 2021
10. ** = ALL SAMPLES WERE TAKEN BY RAMBOLL IN 2020/2021

N

60' 0 60'

Title:

NORTHERN PORTION OF PARCEL 3 PCE AND BENZENE IN SOIL VAPOR

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

Prepared for:

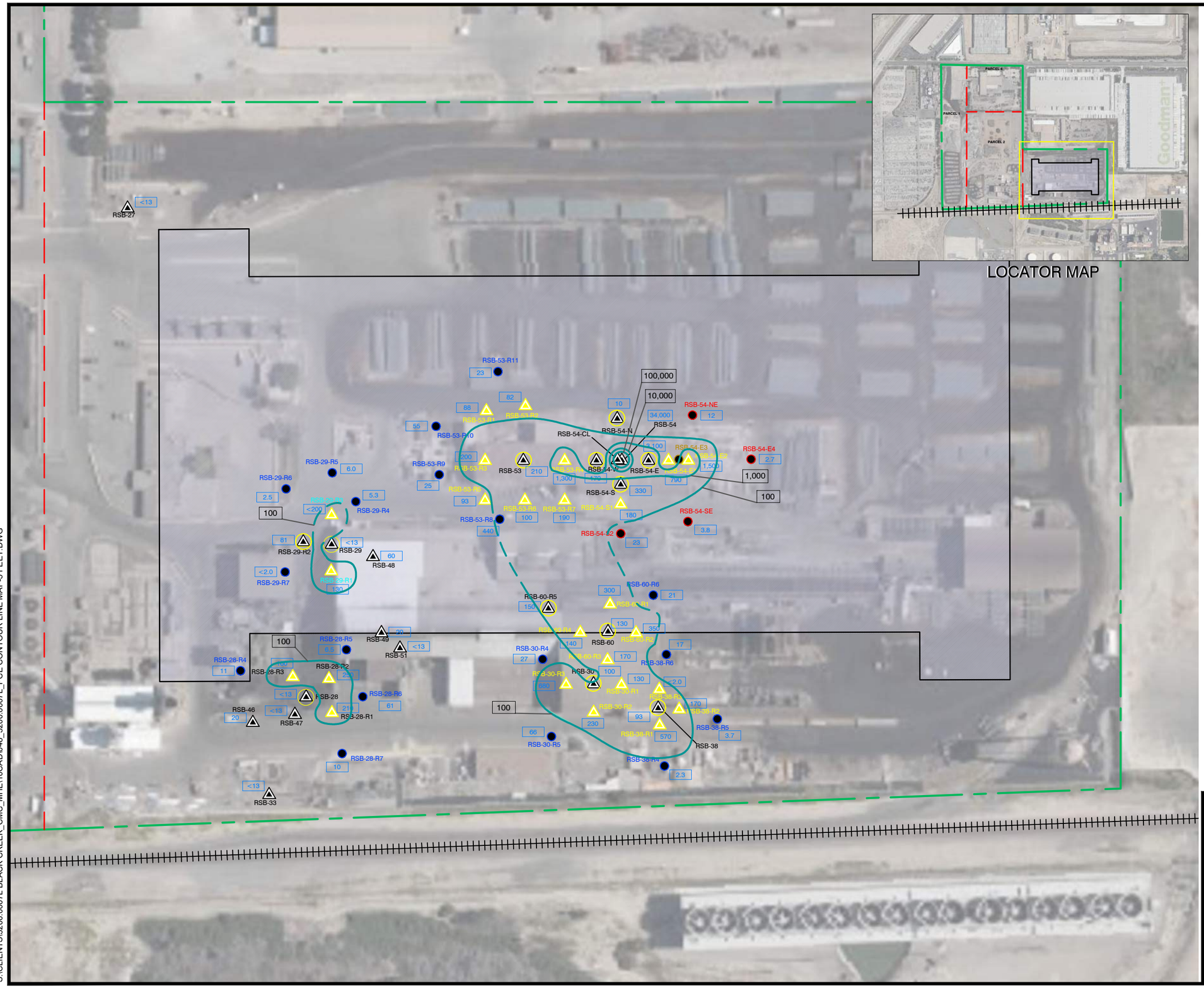
BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 10 MARCH 2023
Prepared by: M.B.	Scale: 1" = 60'
Project Mgr: M.J.N	Project: 3200.0007L
File: 032_3200.0007L_NORTHERN PORTION OF PARCEL 3 PCE & BENZENE.DWG	

FIGURE 15

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\032_3200.0007L_NORTHERN PORTION OF PARCEL 3 PCE & BENZENE.DWG



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- PROPOSED BUILDING
- 27 — PCE CONCENTRATION AT 5 FEET BGS
- RSB-54 — SOIL VAPOR PROBE (RAMBOLL 2020/2021)
- RSB-54-E — SOIL VAPOR PROBE (ROUX 2021)
- RSB-54 — PCE EXCEEDANCE IN SOIL VAPOR (RAMBOLL 2020/2021)
- RSB-54-NE — TRIPLE-NESTED SOIL VAPOR PROBE - 5, 10, 35 FEET BGS (ROUX 2022)
- RSB-53-R11 — DUAL-NESTED SOIL VAPOR PROBE - 5, 15 FEET BGS (ROUX 2022)
- INTERPRETED PCE CONTOUR LINE - 5 FEET BGS (DASHED WHERE INFERRED)

NOTES

1. DEPTH IS IN FEET BELOW GROUND SURFACE (BGS)
2. PCE = TETRACHLOROETHENE
3. PCE CONCENTRATION MEASURED IN UNITS OF MICROGRAMS PER CUBIC METER (UG/M^3)

Title:

PARCEL 3 WITH PCE ISO_CONCENTRATION CONTOURS 5 FEET BGS

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

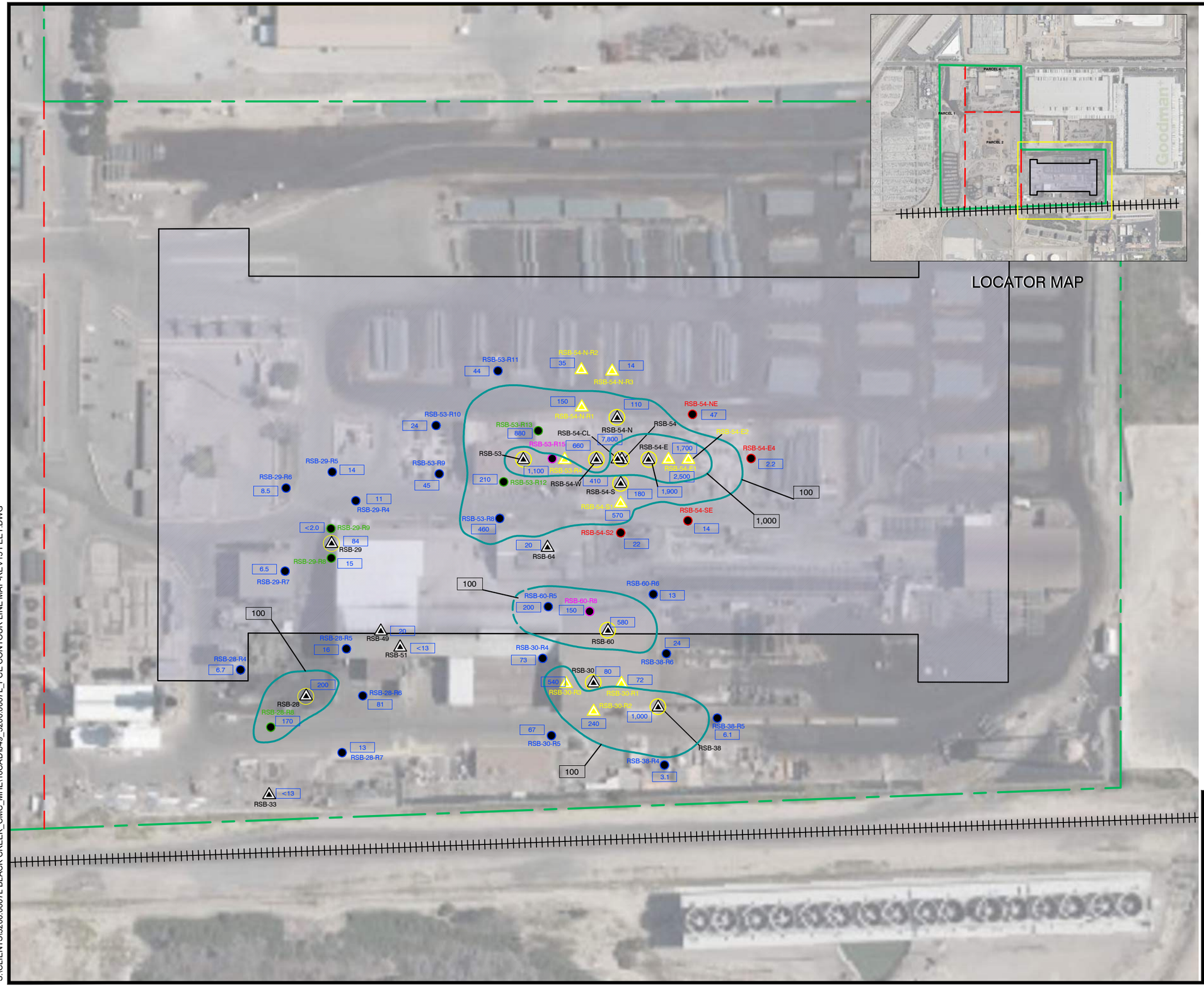
Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 10 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: 1" = 120'	16
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 048_3200.0007L_PCE CONTOUR LINE MAP-5 FEET.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\048_3200.0007L_PCE CONTOUR LINE MAP-5 FEET.DWG



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- PROPOSED BUILDING
- 27 — PCE CONCENTRATION AT 15 FT BGS
- RSB-54 — SOIL VAPOR PROBE (RAMBOLL 2020/2021)
- RSB-54-E — SOIL VAPOR PROBE (ROUX 2021)
- RSB-54 — PCE EXCEEDANCE IN SOIL VAPOR (RAMBOLL 2020/2021)
- RSB-54-NE — TRIPLE-NESTED SOIL VAPOR PROBE - 5, 10, 35 FEET BGS (ROUX 2022)
- RSB-53-R11 — DUAL-NESTED SOIL VAPOR PROBE - 5, 15 FEET BGS (ROUX 2022)
- RSB-60-R8 — DUAL-NESTED SOIL VAPOR PROBE - 15, 35 FEET BGS (ROUX 2022)
- RSB-29-R5 — SOIL VAPOR PROBE - 15 FEET BGS (ROUX 2022)
- INTERPRETED PCE CONTOUR LINE - 15 FEET BGS (DASHED WHERE INFERRED)

NOTES

1. DEPTH IS IN FEET BELOW GROUND SURFACE (BGS)
2. PCE = TETRACHLOETHENE
3. PCE CONCENTRATION MEASURED IN MICROGRAMS PER CUBIC METER (UG/M3)

N

120' 0 120'

Title:

PARCEL 3 WITH PCE ISO-CONCENTRATION CONTOURS 15 FEET BGS

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

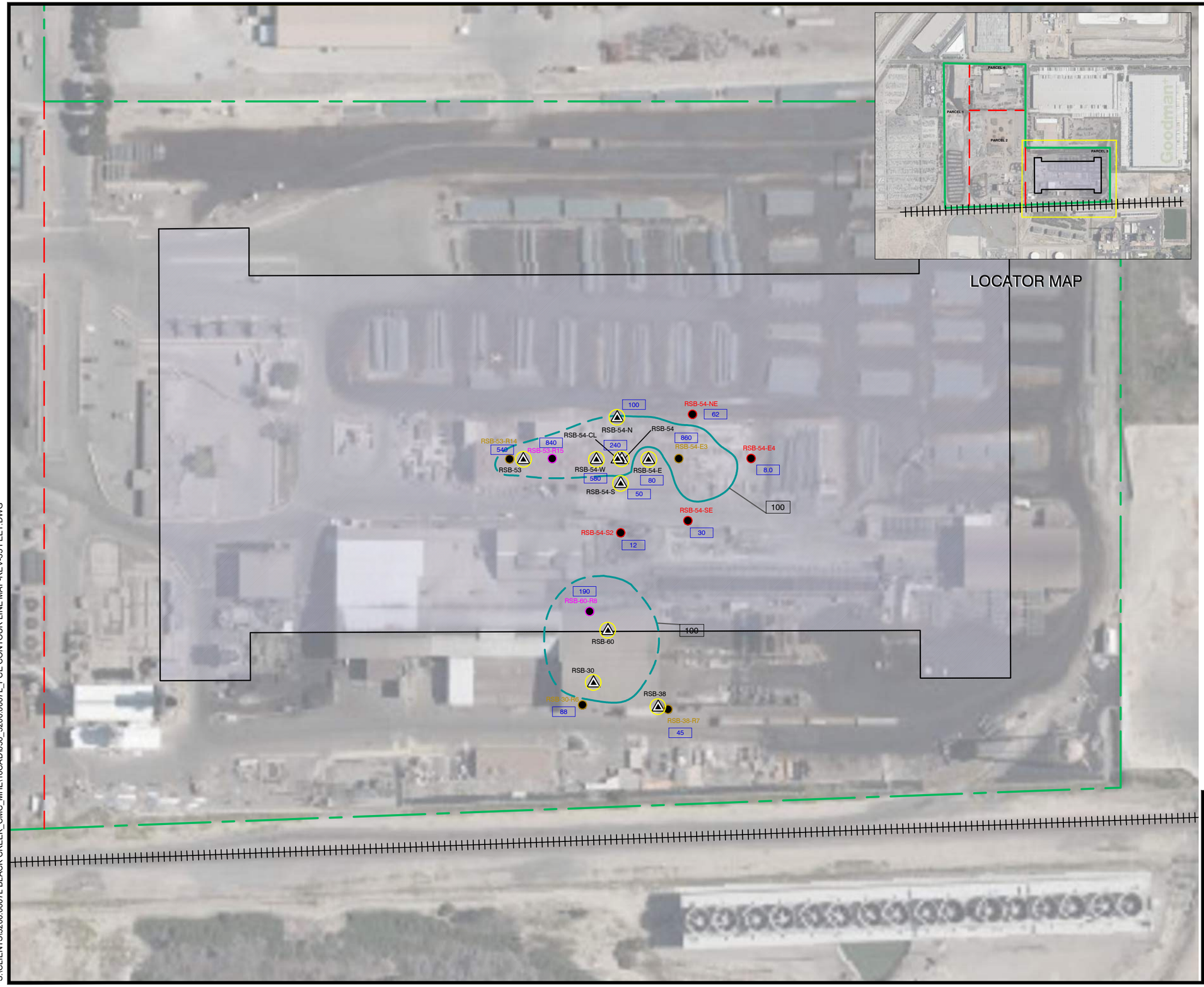
Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: C.J.	Date: 10 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: 1" = 120'	17
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 049_3200.0007L_PCE CONTOUR LINE MAP-REV15 FEET.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\049_3200.0007L_PCE CONTOUR LINE MAP-REV15 FEET.DWG



LEGEND

- SITE BOUNDARY
- PARCEL BOUNDARY
- PROPOSED BUILDING
- 27 — PCE CONCENTRATION AT 35 FT BGS
- RSB-54 — SOIL VAPOR LOCATION (RAMBOLL 2020/2021)
- RSB-54 — PCE EXCEEDANCE IN SOIL VAPOR (RAMBOLL 2020/2021)
- RSB-54-NE — TRIPLE-NESTED SOIL VAPOR PROBE - 5, 10, 35 FEET BGS (ROUX 2022)
- RSB-60-R8 — DUAL-NESTED SOIL VAPOR PROBE - 15, 35 FEET BGS (ROUX 2022)
- RSB-30-R6 — SOIL VAPOR PROBE - 35 FEET BGS (ROUX 2022)
- INTERPRETED PCE CONTOUR LINE - 35 FEET BGS (DASHED WHERE INFERRED)

NOTES

1. DEPTH IS IN FEET BELOW GROUND SURFACE (BGS)
2. PCE = TETRACHLOROETHENE
3. PCE CONCENTRATION IS IN UNITS OF MICROGRAMS PER CUBIC METER (UG/M^3)

N

120' 0 120'

Title:

PARCEL 3 WITH PCE ISO-CONCENTRATION CONTOURS 35 FEET BGS

12451 ARROW ROUTE
RANCHO CUCAMONGA, CALIFORNIA

Prepared for:

BTC III ARROW ROUTE CC LP

ROUX

Compiled by: A.P.	Date: 10 MARCH 2023	FIGURE
Prepared by: M.B.	Scale: 1" = 120'	18
Project Mgr: M.J.N.	Project: 3200.0007L	
File: 050_3200.0007L_PCE CONTOUR LINE MAP-REV-35 FEET.DWG		

S:\CLIENTS\3200.0007L BLACK CREEK_CMC_MHE\10CAD\050_3200.0007L_PCE CONTOUR LINE MAP-REV-35 FEET.DWG

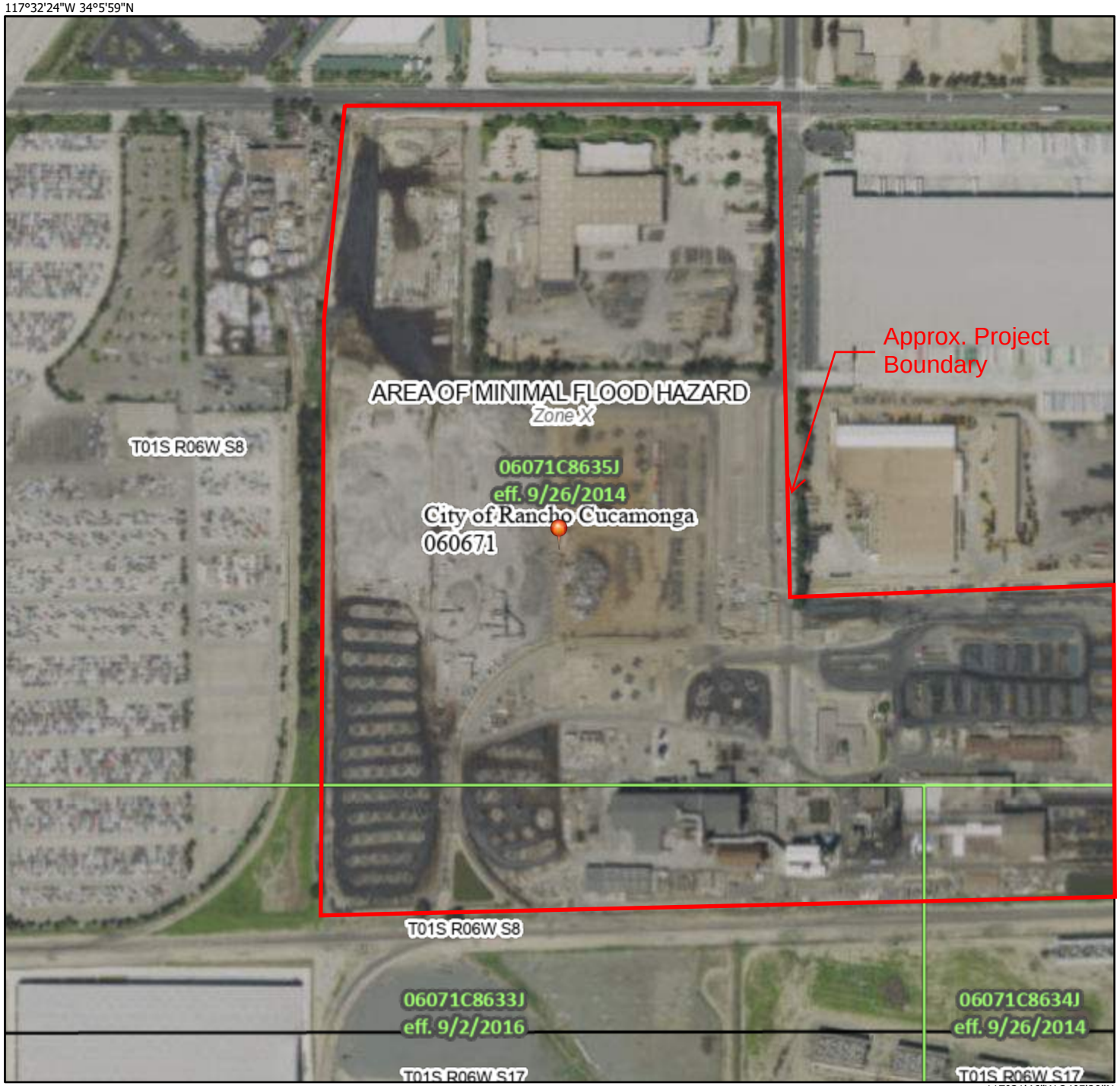
Appendix C

Federal Emergency Management Agency (FEMA) Maps

National Flood Hazard Layer FIRMette

FEMA

117°32'24"W 34°5'59"N



117°31'46"W 34°5'29"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/15/2023 at 6:36 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

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Boundaries of the **floodways** were computed at cross-sections and interpolated between cross-sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11 North. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3 #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

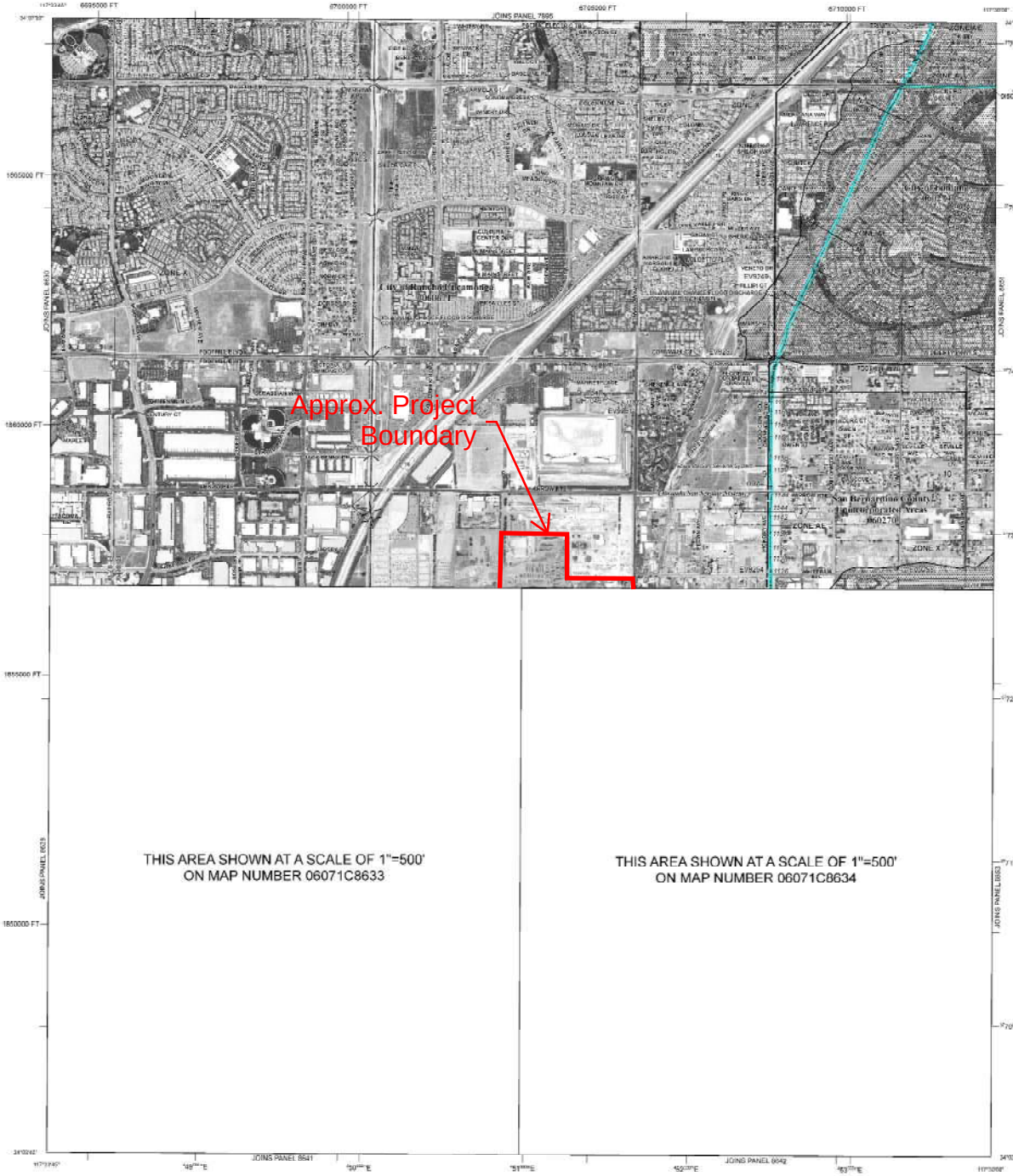
Base map information shown on this FIRM was provided in digital format by the San Bernardino County GIS GIS Department, United States Geological Survey, the Bureau of Land Management, the United States Department of Agriculture, and the National Geodetic Survey. This imagery was flown by the US Department of Agriculture Farm Service Agency in 2012 and was produced with a 1-meter ground sampling distance.

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For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
513 — Base Flood Elevation line and value; elevation is feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988
A — A — Cross section line
23 — 23 — Transect line
97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), western hemisphere
4275000 FT — 1000-meter Universal Transverse Mercator grid values, zone 11
6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 405), Lambert projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
March 18, 1998

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 26, 2014 (for a description of revisions, see Notice to Users page in the Flood Insurance Study report)

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 8635J

FIRM

FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 8635 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Notice to User: The Map Number should be used when placing map orders; the Community Number should be used on insurance applications for the subject community.

MAP NUMBER 06071C8635J

MAP REVISED SEPTEMBER 26, 2014

Federal Emergency Management Agency

NOTES TO USERS

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NOAA, NINGS12
National Geodetic Survey
SSMC-3, #9202
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Silver Spring, Maryland 20910-3282
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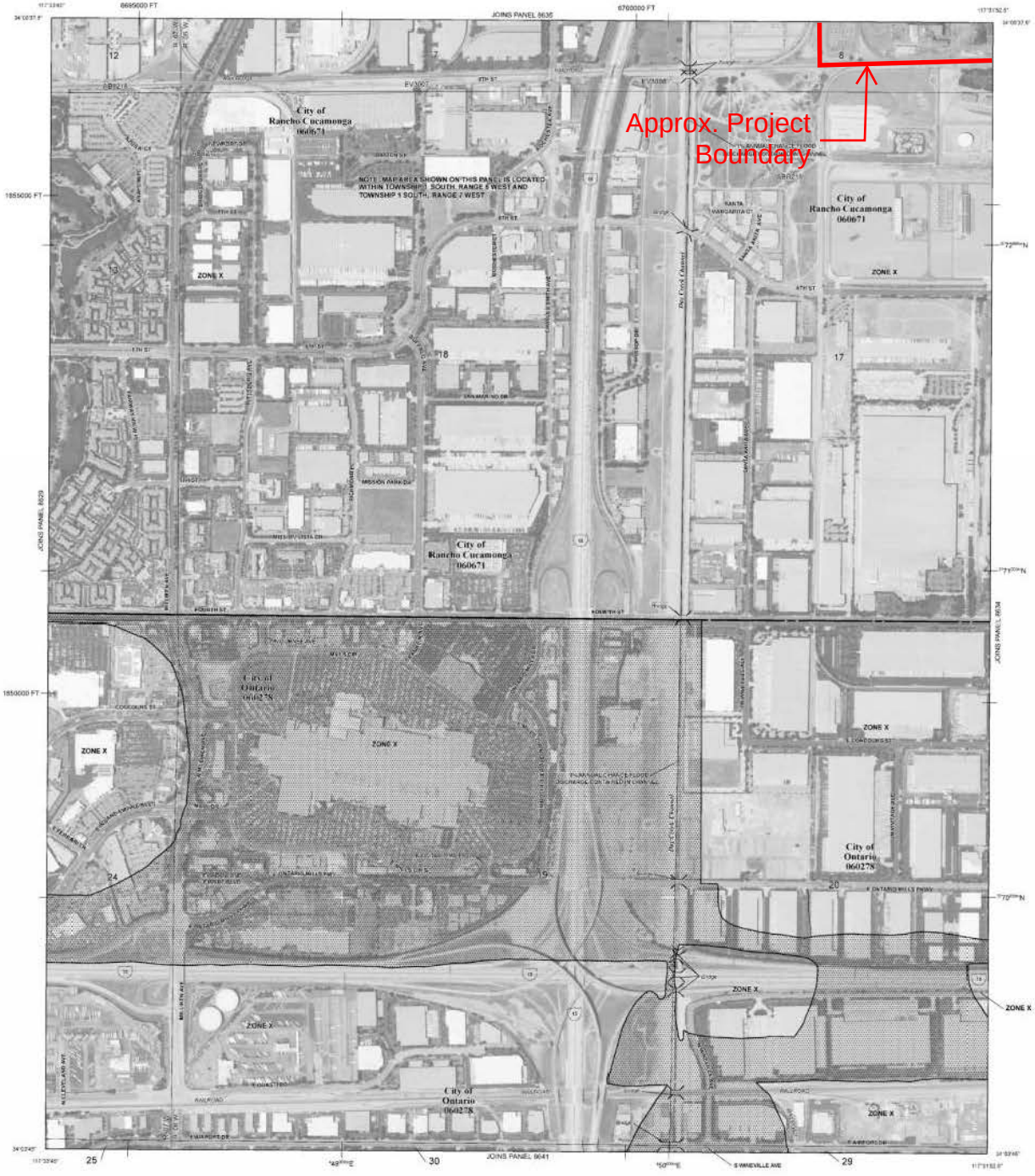
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LEGEND

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ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of Different Base Flood Elevations, Flood Depths, or Flood Velocities
513 — Base Flood Elevation line and value; elevation in feet*
(EL. 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988
A — A — Cross section line
23 — 23 — Transect line
97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4278000mE — 1000-meter Universal Transverse Mercator grid values, zone 11
6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 4405), Lambert projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 2, 2016 – to change Base Flood Elevations, to add Base Flood Elevations, to change Special Flood Hazard Areas, to add Special Flood Hazard Areas, to change zone designations, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 8633J

FIRM

FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 8633 OF 9400

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ONTARIO, CITY OF	060274	8633	J
RANCHO CUCAMONGA, CITY OF	060671	8633	J

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 06071C8633J

MAP REVISED SEPTEMBER 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11 North. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by the San Bernardino County ISD GIS Department, United States Geological Survey, the Bureau of Land Management, the United States Department of Agriculture, and the National Geodetic Survey. This imagery was flown by the USDA Department of Agriculture Farm Sevice Agency in 2012 and was produced using 1-meter ground sampling distance.

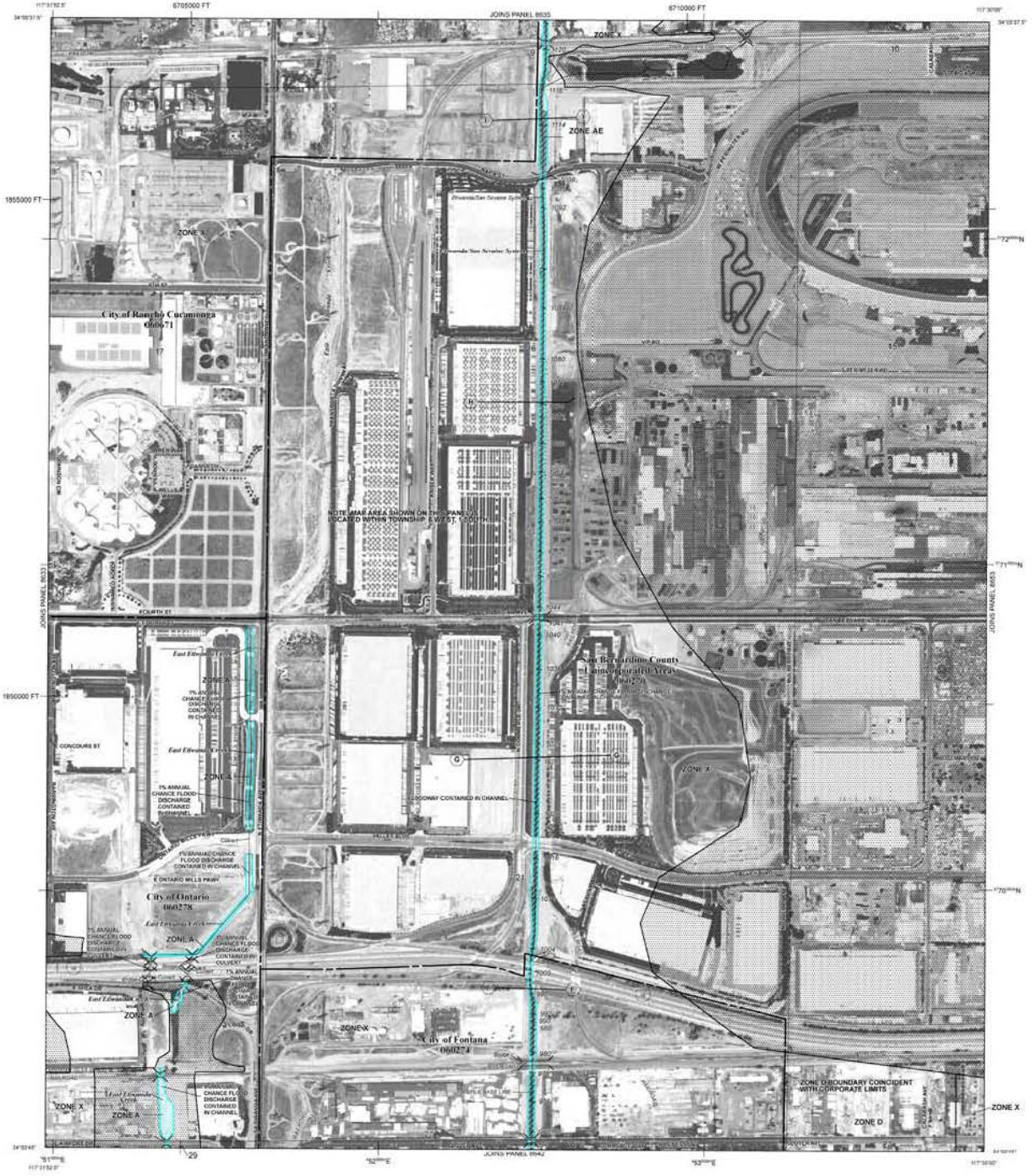
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Approx. Project Boundary



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, A1, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
513 (EL 987) — Base Flood Elevation line and value; elevation in feet*
Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A — Cross section line
23 — 23 — Transect line
97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
1000-meter Universal Transverse Mercator grid values, zone 11
5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 405), Lambert projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
March 18, 1998

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 26, 2014- for a description of revisions, see Notice to Users page in the Flood Insurance Study report

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 8634J

FIRM
FLOOD INSURANCE RATE MAP
SAN BERNARDINO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 8634 OF 9400
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FONTANA, CITY OF	060274	8634	J
ONTARIO, CITY OF	060278	8634	J
RANCHO CUCAMONGA, CITY OF	060671	8634	J
SAN BERNARDINO COUNTY	060270	8634	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06071C8634J

MAP REVISED
SEPTEMBER 26, 2014

Federal Emergency Management Agency

Appendix D

Drainage/Vicinity Map

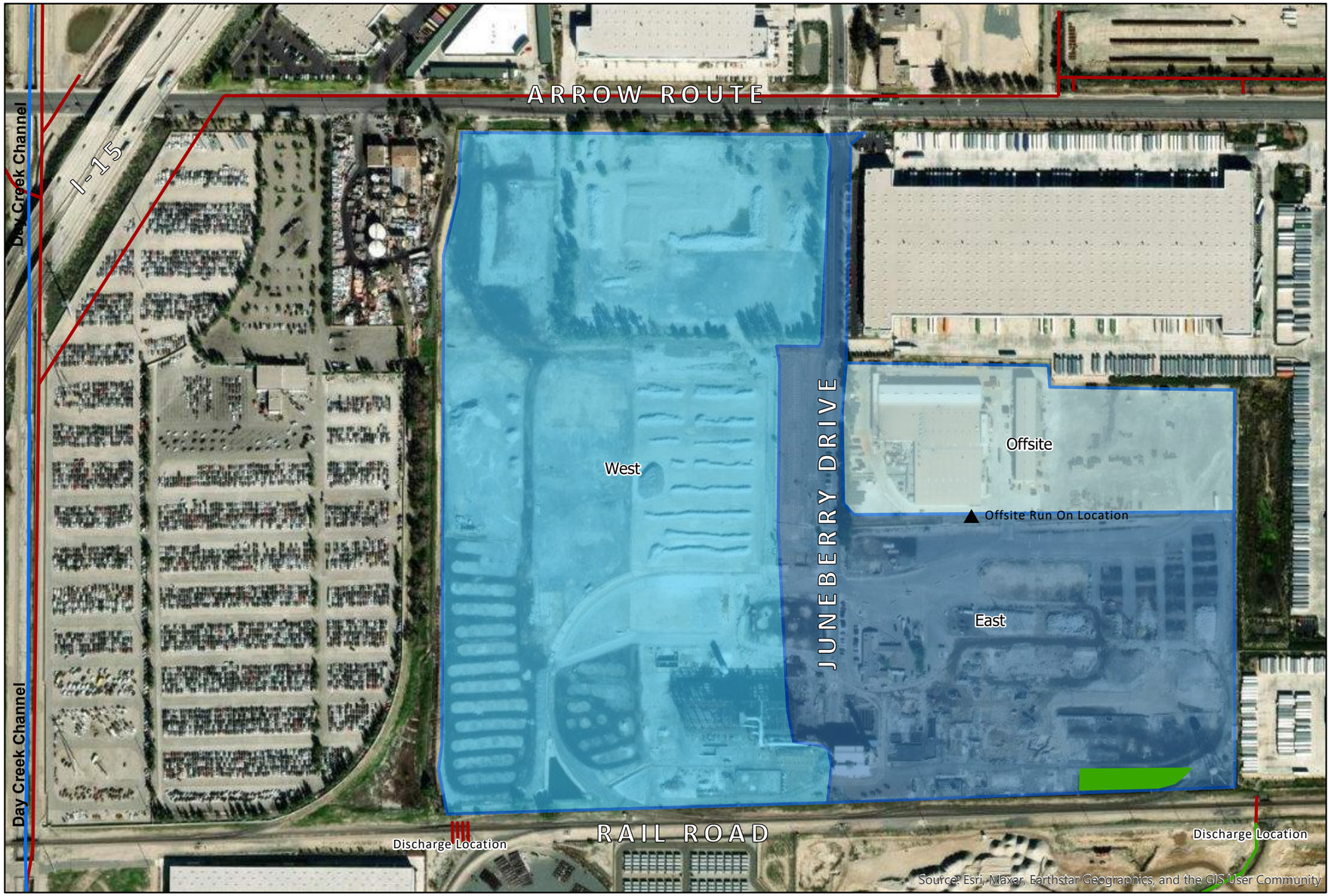
Legend

Drainage Facilities

- EHM (Waterbodies Exempt from Hydromodification)
- Non-EHM (Low)
- Non-EHM (Medium)
- Non-EHM (High)
- Non-EHM (default-high)
- Existing Storm Drain
- Existing Channel
- Existing Detention Basin

Drainage Basins

- East
- Offsite
- West
- <all other values>



N

0 140 280 560 840 1,120 Feet

RICK ENGINEERING COMPANY

Source of EHM Facilities and Existing Storm Drain: County of San Bernardino Public Works (https://sbcountydpw.maps.arcgis.com/apps/webappviewer)
Source of aerial imagery: Esri
Date of Exhibit: 12/12/2023

SEIQ Rancho Cucamonga
Drainage and Vicinity Map for
Arrow Commerce Center Pre-Project Condition
Rick Engineering JN- 19871-A

Legend

Drainage Facilities

- EHM (Waterbodies Exempt from Hydromodification)
- Non-EHM (Low)
- Non-EHM (Medium)
- Non-EHM (High)
- Non-EHM (default-high)
- Proposed Storm Drain
- Existing Storm Drain
- Existing Channel
- Existing Detention Basin

Proposed BMPs

- Proprietary Biofiltration Unit and CMP Detention Facility
- Infiltration Basin

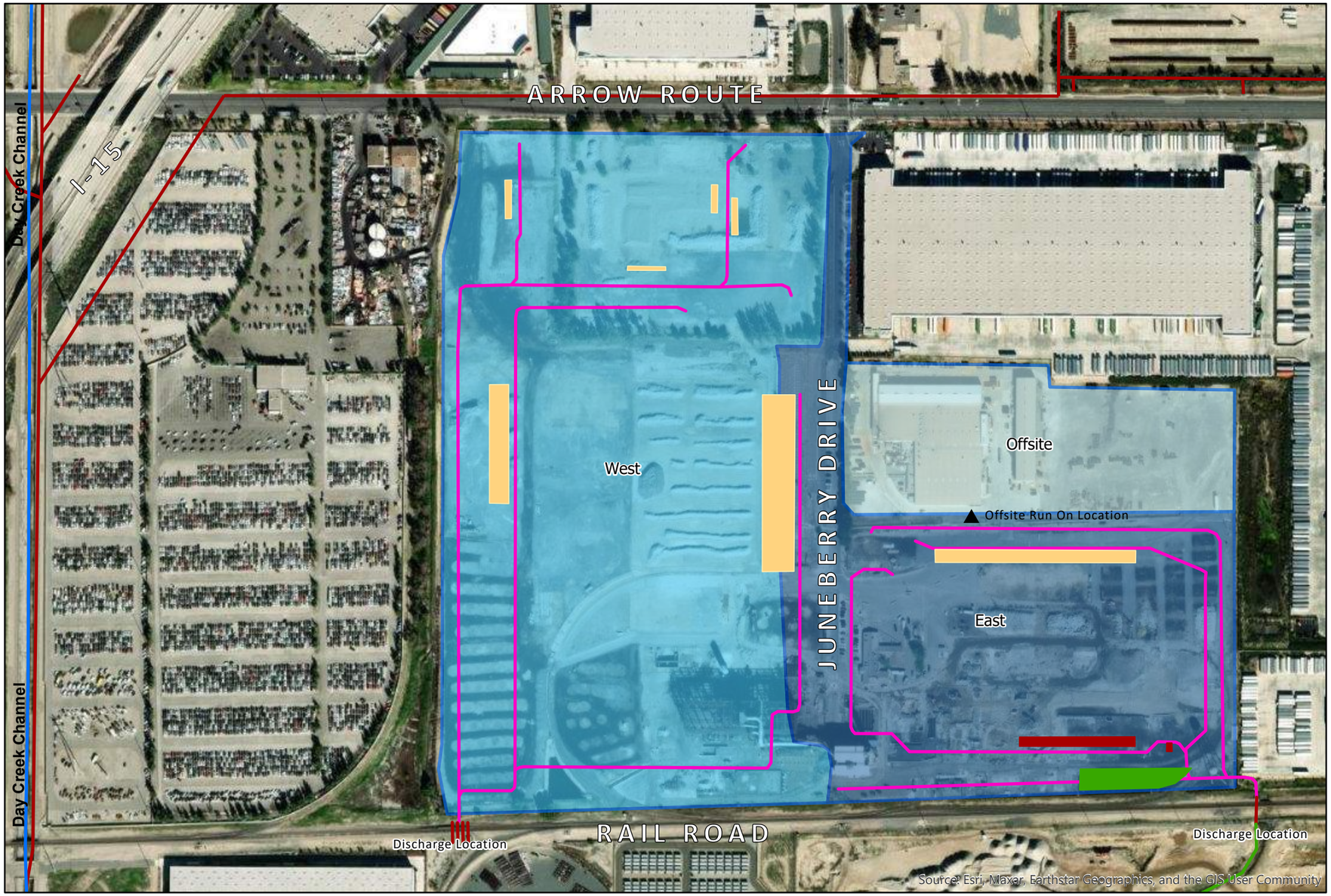
Drainage Basins

- East
- Offsite
- West
- <all other values>

Note: the Storm Drain and BMP Information shown on this exhibit is shown for reference from the following technical reports prepared by others:

"Preliminary Hydrology Calculations for Arrow Route and Juneberry Drive Industrial Development", prepared by Thienes Engineering, dated May 8, 2023.

"Preliminary Water Quality Management Plan for Arrow Route and Juneberry Drive Industrial Development", prepared by Thienes Engineering, dated May 18, 2023.



N

0 140 280 560 840 1,120 Feet

RICK ENGINEERING COMPANY

Source of EHM Facilities and Existing Storm Drain: County of San Bernardino Public Works (https://sbcountydpw.maps.arcgis.com/apps/webappviewer)
Source of aerial imagery: Esri
Date of Exhibit: 12/12/2023

SEIQ Rancho Cucamonga
Drainage and Vicinity Map for
Arrow Commerce Center Post-Project Condition
Rick Engineering JN- 19871-A