CITY OF OCEANSIDE

La Salina Lift Station and Treatment Plant Decommissioning

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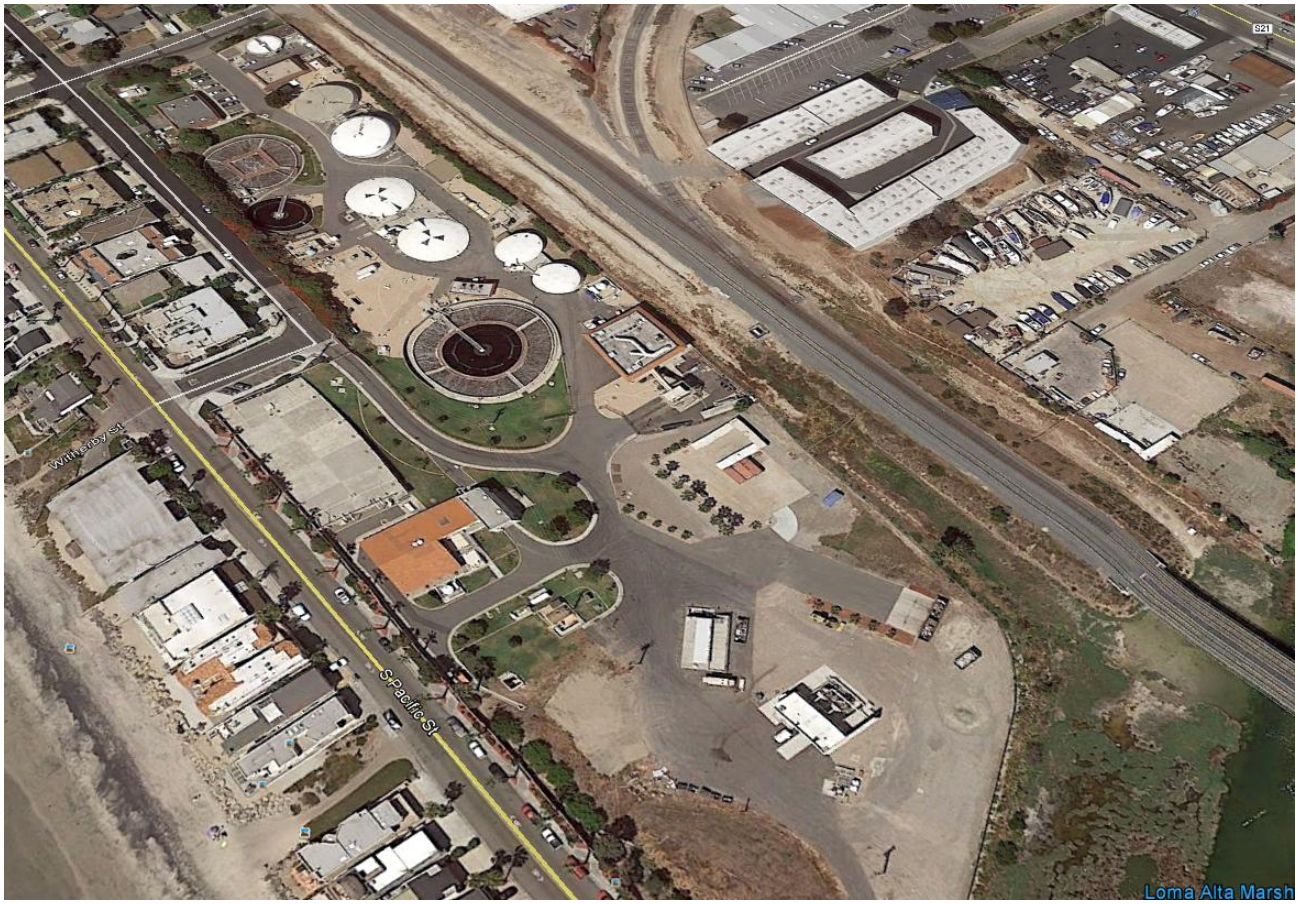

TETRA TECH

December 2017

La Salina Lift Station and Treatment Plant Decommissioning

December 2017

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ACRONYMS/ABBREVIATIONS

Acronym or Abbreviation	Definition
ACM	Asbestos containing materials
AMSL	Above mean sea level
APCD	Air Pollution Control District
CMU	Concrete masonry unit
CY	Cubic yard
EA	Each
EBCT	Empty bed contact time
fps	Feet per second
GAC	Granular activated carbon
gpm	Gallons per minute
HDPE	High density polyethylene
HGL	Hydraulic grade line
HP	Horsepower
HWL	High water level
ID	Inside diameter
KW	Kilowatt
LBP	Lead based paint
LF	Lineal foot
LWL	Low water level
LS	Lump sum
LSWWTP	La Salina Wastewater Treatment Plant
MALS	Mission Avenue Lift Station
MBDF	Mission Basin Desalting Facility
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
MG	Million gallons
mgd	Million gallons per day
PCB	Polychlorinated biphenyl
PLC	Programmable logic controller
psi	Pounds per square inch
SF	Square foot
SLRWRF	San Luis Rey Water Reclamation Facility
TDH	Total Dynamic Head
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
VFD	Variable frequency drive

EXECUTIVE SUMMARY

To be included in final report.

1. PROJECT BACKGROUND

1.1 DESCRIPTION

The La Salina Wastewater Treatment Plant (LSWWTP) was originally constructed in 1948 and has been expanded and rehabilitated over the years. LSWWTP serves as the connection point for multiple regional discharge pipelines including treated effluent from Fallbrook, Camp Pendleton, and the San Luis Rey Water Reclamation Facility (SLRWRF); as well as brine from the Mission Basin Desalting Facility (MBDF) and an industrial discharger. These flows are combined at or near the LSWWTP site before being discharged to the ocean from the City's Ocean Outfall Pipeline.

Since significant repairs to the LSWWTP are necessary, an evaluation was performed during previous studies of potential alternatives. In November 2014, the City Council approved the recommendation to decommission the aging La Salina Wastewater Treatment Facility and construct a new sewer lift station to convey raw wastewater flows to the City's San Luis Rey Water Reclamation Facility.

1.2 SCOPE OF WORK

This project consists of demolishing the LSWWTP and replacing it with a raw wastewater pump station to convey wastewater from the LSWWTP collection area to San Luis Rey Water Reclamation Facility. The additional flows to the SLRWRF will also benefit future reclaimed water treatment expansion and indirect or direct potable reuse near the Mission Basin Desalting Facility.

Key features of the project include:

- Decommissioning of the existing La Salina Wastewater Treatment Plant
- Construct new raw wastewater lift station at La Salina
- Preparing a detailed Environmental Impact Report that will meet CEQA requirements
- Reconstruction of the existing dry weather stormwater treatment facility
- Coordinating with local businesses and residential community

Construction of the station will include civil work; mechanical piping; structural and architectural work; and landscape and irrigation. Features of the new station include emergency overflow wet-well, emergency generation, odor control, electrical, telemetry, and security equipment. Additionally, a major component of this design will be to provide a detailed grading plan for both mass and fine grading to accommodate future residential development and a local community park.

The new sewer lift station must be designed and constructed with the City operators in mind. Careful attention to operator needs will be critical and will include:

- Incorporation of City "preferred equipment"
- Design to rectify "ragging" issues

- Review of the existing force main sizing
- Selection of pumps for the expected flows
- Selection of pump drives (variable speed vs. constant speed)
- Layout of overflow/emergency storage
- Access and working room at site
- Design of odor control facilities
- Design of SCADA, security systems and lighting

During the course of the project, the original scope of work was expanded to include the relocation and reconstruction of the existing dry weather storm water treatment facility, preparation of a full Environmental Impact Report instead of a Mitigated Negative Declaration, preparation of a 30 percent design for a new force main from the La Salina Lift Station to tie into an existing force main to the SLRWRF. The Environmental Impact Report will be prepared as a separate document but will also contain information from this preliminary design report.

2. LIFT STATION PRELIMINARY DESIGN

2.1 LIFT STATION CRITERIA

The La Salina Sewer Lift Station will be designed as a facility that is similar to the City's other sewer lift station facilities, such as the Mission Avenue and Oceanside Boulevard lift stations, and the design will be tailored to the site-specific conditions for this project.

2.1.1 Flow Data

As described in the technical memo in Appendix C, raw sewage enters the existing treatment plant from the influent manhole on the north-westerly side of the headworks building. The influent manhole collects sewage from the existing 33-inch gravity sewer on Tait Street as well as pumped flows from the South Pacific Lift Station. The City provided the following flow rates for the proposed La Salina Lift Station:

- Average Flow: 5.5 MGD (3,820 gpm)
- Peak Flow: 10.2 MGD (7,083 gpm)

The City also provided flow data from the SCADA system at a flow meter located near the headworks of the treatment plant. As noted and analyzed in Appendix C, the flow meter readings were collected over four different dates. For each date, the flow rate was taken at 5 minute increments over a period of 24 hours. The average and peak flow rates from the flow meter readings are as follows:

- Flow Meter Average Flow: 3.1 MGD (2,153 gpm)
- Flow Meter Peak Flow: 9.7 MGD (6,705 gpm)

The flow meter data is not indicative of typical treatment plant operations due to the small sample size; however, it does show that peak influent flows during some recent wet weather events are close to the provided flow rate of 10.2 MGD.

2.1.2 Design Criteria

As part of the La Salina Lift Station and Plant Decommissioning Project, the City will need to convey raw sewage from the La Salina Wastewater Treatment Plant collection area to the SLRWRF, which is located over seven miles away. The following design criteria shall be used in evaluating the La Salina Force Main:

- Velocity in the force main shall not be less than 2 feet per second (fps) to keep solids suspended in the flow. Preferably velocities shall be kept at no less than 3 fps to re-suspend solids that may have settled during non-operation
- Velocities in the force main shall not exceed 10 fps in order to limit headloss in the pipeline due to friction. Increased force main headloss results in additional pumping costs
- Pressure within the force main shall not exceed 150 psi

The following pipe sizes have been evaluated at the average flow rate of 5.5 MGD and peak flow rate of 10.2 MGD for the La Salina Force Main:

Table 2-1
Summary of Pipe Sizes and Velocities

Pipe Inside Diameter (inches)	Velocity at Average Flow of 5.5 MGD (fps)	Velocity at Peak Flow of 10.2 MGD (fps)
16	6.1	11.3
18	4.8	8.9
20	3.9	7.2
24	2.7	5.0
30	1.7	3.2

The table above shows that the velocity in a 20-inch inside diameter pipeline provides a cleaning velocity high enough to move solids through the pipeline and velocity low enough to limit excess headloss. A 20-inch inside diameter force main will be used for analysis in this report.

2.1.3 Operating Alternatives

The original scope of work included repurposing the existing 16-inch Fallbrook Outfall to convey the sewage flows up to Pala Road and then tie into the existing 24-inch Mission Force Main for conveyance to the SLRWRF. Tetra Tech prepared a technical memo in Appendix A that reviewed and summarized recommendations for performing a condition assessment of the existing pipeline. Tetra Tech also prepared a technical memo in Appendix B that discussed the current condition of the pipeline and defined the design criteria needed in order to repurpose the Fallbrook Outfall.

A preliminary analysis performed in Appendix C showed that this alternative would limit the amount of flow pumped by the La Salina Lift Station and would require a detailed condition assessment along with possible repairs in order to convert the pipeline into a sewage force main. Therefore, the City asked Tetra Tech to complete a force main alignment feasibility study. Based on discussions with the City, the following alternatives were initially considered:

- Alternative 1: An alignment that runs parallel to the existing 16-inch Fallbrook Outfall and ties into the existing Mission Avenue Force Main at Pala Road
- Alternative 2: An alignment that runs along Mission Avenue and ties into the existing Mission Avenue Force Main, just after the Mission Avenue Lift Station (MALS)
- Alternative 3: An alignment that runs along Oceanside Boulevard and ties into the existing Mission Avenue Force Main, just after the MALS

The City then asked Tetra Tech to evaluate the feasibility of pumping into the future El Corazon Lift Station, which would then pump into the existing Buena Vista Pipeline for conveyance to the SLRWRF. Tetra Tech reviewed this alternative in Appendix D and found that this alternative was feasible.

The City also asked Tetra Tech to evaluate the feasibility of the following two additional alternatives:

- An alignment that runs along Oceanside Boulevard and turns into a new trunk sewer with combined flow from the Oceanside Boulevard and Mesa Drive gravity sewers, and then ties into the Buena Vista Pipeline

- An alignment utilizing the existing 24-inch Water Reclamation Line as a casing for the proposed La Salina force main

Tetra Tech reviewed these two additional alternatives in Appendix E and found that these alternatives were not viable options. Therefore, these alternatives were excluded from the force main alignment feasibility study.

In summary, it was determined that the following alternatives would be evaluated in the Force Main Alignment Feasibility Study, which can be found in Appendix F:

- Alternative 1: An alignment that runs parallel to the existing 16-inch Fallbrook Outfall and ties into the existing Mission Avenue Force Main at Pala Road
- Alternative 2: An alignment that runs along Mission Avenue and ties into the existing Mission Avenue Force Main, just after the MALS
- Alternative 3A: An alignment that runs along Oceanside Boulevard and ties into the existing Mission Avenue Force Main, just after the MALS
- Alternative 3B: An alignment that runs along Oceanside Boulevard and is directed into the future El Corazon Lift Station, which then pumps flow into the existing Buena Vista Pipeline
- Alternative 3C: An alignment that runs along Oceanside Boulevard and ties directly into the existing Buena Vista Pipeline

The study recommended that the City proceed with investigating Alternative 3C and gravity sewer main improvements for the Oceanside Boulevard and Mesa Drive gravity sewers.

The City has initially indicated it prefers Alternative 3C and is looking into re-routing the existing Oceanside Boulevard and Mesa Drive gravity flows into the Mission Lift Station. For the purposes of this preliminary design report, a design flow rate of 5.5 MGD (3820 gpm) will be pumped from the La Salina Lift Station through a new 20-inch, inside diameter force main and tie into the existing the Buena Vista Pipeline at the intersection of Oceanside Boulevard and El Camino Real. The Oceanside Boulevard and Mesa Drive gravity flows will be omitted from this analysis. The design flow rate of 5.5 MGD (3,820 gpm) will require the use of a load equalization tank to attenuate peak flows in addition to an emergency storage basin which will be discussed in a later section.

2.1.4 System Curve

The system head curve was developed by plotting a range of flow rates versus the total dynamic head (TDH) of the system. The TDH is the sum of the static head and the dynamic head. The static head is based on the difference between the influent elevations in the wet well and the hydraulic grade line (HGL) elevation of the connection point at the Buena Vista Pipeline. The dynamic head includes the pipe friction losses and minor losses. Based on the system head curve shown in Appendix O, a TDH of approximately 176 feet is seen at the design flow rate of 3,820 gpm.

The City's preferred configuration of the wet well and pumps is to have two identical wet wells that can be isolated from each other, each with two pump intakes. There will be a total of four pumps in parallel, with a common inlet header in the dry pit allowing each pump the capability of pumping out of either wet well. Additional discussion of the wet wells can be found in the section below.

With a four pump design, it is recommended that the design flow be met with two pumps. Therefore, the capacity of each pump shall be 1,910 gpm at 176 feet TDH.

The City's preferred pump type is a centrifugal chopper pump, however, in previous discussions with the City, they are also open to using a cutter pump. Two manufacturers were contacted to obtain preliminary pump

selections: Vaughan (chopper pump) and Cornell (cutter pump). Data and pump curves from each manufacturer are included in Appendix P. While the City's other lift stations are constant speed with soft start motors, the La Salina Lift Station pumps will be equipped with variable frequency drives (VFDs) to better control flows and pumping into a combined force main.

In order to provide additional capacity during rain/emergency events, the City could potentially pump more than the design flow rate of 3820 gpm by using three pumps.

2.1.5 Pump Station Configuration

As mentioned above, the City's preferred configuration of the wet well and pumps is to have two identical wet wells that can be isolated from each other which will help facilitate maintenance of the lift station. A junction splitter box upstream of the wet well will be constructed where several influent sewer lines will discharge into the box. The splitter box will have two outlets, one to each wet well chamber, and each with a sluice gate. To allow continuous operation, a suction header and valves in the dry well will allow each of the pumps the ability to operate from either chamber.

The wet well will operate based on five level controls; the low water alarm level, the low water level (LWL), the high water level (HWL), the overflow water level and the high water alarm level. The low water alarm level will be based on the minimum pump submergence (as recommended by the Hydraulic Institute (HI) Standards to prevent vortices and increase pump performance). The LWL will be when the first pump turns on when the influent water level is increasing and will be when the pumps turn off when the influent water level is decreasing. The HWL will be when the second pump turns on. The overflow water level will be when the influent water begins to overflow into the load equalization tank and will be set above the HWL to ensure flow is not diverted to the load equalization tank during the design flows. The high water alarm level will be the maximum water level.

The overflow into the load equalization tank will be located within the splitter box so that the load equalization tank operates autonomously, even when a wet well chamber is out of operation for maintenance. A sluice gate in the splitter box will allow isolation of the load equalization tank. The overflow into the emergency storage tank will be a weir located in the wall between the load equalization tank and emergency storage tank. A sluice gate located in the bottom of the same wall will allow the for the emergency storage tank to drain back into the load equalization tank.

The volume of the load equalization tank and emergency storage is a function of the finished floor elevation (which must allow gravity flow into the operating wet well), the elevation of lowest manhole rim in the influent gravity sewer system, and the available space on the site.

The maximum water level used to calculate the volume of the load equalization tank and emergency wet well is assumed to be 3 feet below the lowest manhole rim elevation in the gravity sewer system. This assumes that in the event of an emergency, the gravity sewer system can be used for storage. The volume of the gravity system is not considered as part of the emergency wet well volume, however to maximize the volume of the emergency wet well without increasing the footprint, it is assumed that the gravity sewer system can back up to a point that would not cause an overflow at any point in the system. As a factor of safety, this is assumed to be 3 feet below the lowest rim elevation.

The critical manhole rim elevation is based on the manhole southeast of the site in the Buccaneer Park parking lot near Loma Alta Creek. The ground elevation is approximately elevation 11. As a result, the maximum high water level in the wet well, load equalization tank and emergency storage tank will be limited to elevation 8.0 to allow for 3 feet of freeboard.

The load equalization tank shall be designed for the lower flow rate of 3.5 MGD in order to provide adequate storage. At a flow rate of 3.5 MGD, the load equalization tank would need to be sized at 600,000 gallons.

The City desires two hours of on-site emergency storage to provide response time for operation staff should there be a failure at the lift station and pumping operations cease. A 500,000 gallon storage basin provides 2.2 hours of storage at the design flow rate of 5.5 MGD and meets the City's two hour storage criteria. This volume in combination with the 600,000 gallons of load equalization would result in a total on-site storage volume of 1.1 million gallons.

Preliminary dimensions of the wet wells, load equalization tank and emergency storage tank are summarized below in Table 2.2. Preliminary layouts of the wet wells, load equalization tank and emergency storage tank can be seen in Figures 4-3, 4-4 and 4-5 in Appendix I. A more detailed review of the wet well controls, load equalization tank and emergency storage tank will be provided in final design.

A hydraulic surge analysis will be performed as part of the scope of work on the pump station and force main to determine whether a surge tank is required. The results of the surge analysis will be presented in Appendix N in the final report.

2.1.6 Pump Station Design Features

Based on discussions with the City and review of previous reports, some of the design features at the La Salina Lift Station will include the following items:

- Chopper or cutter pumps (Vaughn, Cornell)
- Provide space for future in-line sewage grinders (Muffin Monster)
- Provide variable frequency drives (VFD) for each pump
- Use swing check valves; no slanting disc check valves
- Two (2) chamber wet well with upstream splitter box to divide incoming flow (similar to the City's other sewer lift stations)
- Sluice gates with corrosion resistant materials (316 stainless steel) for wet well isolation
- Manifold on pump intake header to allow each pump to operate from either wet well chamber
- Piped connection to wet well for measuring pressure
- Dezurik eccentric plug valves for isolation
- Odor control wet scrubber to include splitter box, wet well, load equalization tank and emergency wet well storage areas.
- Wet scrubber chemical tanks to be outside for easier filling; include containment area which drains to splitter box
- Pre-treatment using bioxide; tank to be outside for easier filling; include containment area which drains to splitter box
- 1" wash down connection in each chamber of the wet well
- 2" wash down connection in the dry well
- Sump pump in dry well which discharges to wet well; dry well floor will slope towards sump
- Temporary bypass connection to force main outside lift station
- Manholes covers shall be 3 feet maximum
- Double link seals on below grade wall penetrations
- Emergency generator set inside lift station
- Bridge crane to remove pumps, generator and other large equipment; no skylights for pump removal
- Lift station structure constructed of CMU with a metal truss roof with composite roof tiles (color palette to be determined, CMU style to be determined)
- No windows or skylights in building

- CMU interior will be painted (color to be determined)
- T-Lock lining in wet well and emergency well, full height
- Uncoated concrete walls in dry well
- Exterior water proofing and underlayment for below grade structure
- Induction type lighting – fixtures shall be located on wall or suspended but shall be accessible with a standard height ladder
- Aluminum stairs and mid-level decking
- Aluminum grating in upper-level deck for pump removal; multiple grating sections are acceptable; grating frame shall be 3 inches wide; no FRP grating
- Fall protection around openings in floor
- Eyewash inside building; floor drain in upper-level deck will drain to splitter box
- Exposed electrical conduits shall be PVC coated rigid galvanized steel
- Intrusion alarms on lift station doors; no security cameras or motion detectors

2.2 DESIGN CRITERIA SUMMARY

A summary of the La Salina Lift Station design criteria is presented in the table below:

Table 2-2
Design Criteria Summary

Lift Station Capacity	
Design Flow	5.5 mgd (3,820 gpm)
Wet Well Configuration	
Wet well compartments	2
Width	12 feet
Length	34.5 feet
Operating Depth with 1 Pump	4 feet
Water Level	-5.5 feet AMSL
Low Water Level	-9.5 feet AMSL
Finished Floor Elevation	-13 feet AMSL
Pumps	
Type	Centrifugal chopper or cutter pumps, submersible motors, VFDs
Design Configuration	2 pumps per wet well
Number of pumps	4 total; 2 duty, 2 standby
Capacity of each pump	1,910 gpm
Max pumping capacity	3,820 gpm
Operating scenario for peak wet weather flows:	3 duty pumps and 1 standby to accommodate the peak flow, both wet wells operating together
Number of pumps	4 total; 3 duty, 1 standby
Capacity of each pump	1,910 gpm
Max pumping capacity	5,000 gpm
Load Equalization Tank	
Storage Time @ peak flow of 10.2 MGD	1.4 hours
Storage Time @ design flow of 5.5 MGD	2.6 hours
Total Volume	600,000 gallons

Number of Compartments	1
Water Depth (avg)	17 feet
Length x Width of basin	75 feet x 65 feet
Top of basin structure	14 feet AMSL
Invert of basin structure	-7.5' AMSL
High water level	8 feet AMSL
Emergency Storage Tank	
Storage Time @ peak flow of 10.2 MGD	1.2 hours
Storage Time @ design flow of 5.5 MGD	2.2 hours
Total Volume	500,000 gallons
Number of Compartments	1
Water Depth (avg)	15 ft
Length x Width of basin	75 ft x 60 ft
Top of basin structure	14 feet AMSL
Invert of basin structure	-7.5 feet AMSL
High water level	8 feet AMSL

2.3 ON-SITE PIPING CONSIDERATIONS

There are several incoming gravity flows which must be re-routed to the La Salina Lift Station wet well. These lines include the 33-inch gravity sewer from Tait Street, the 12-inch gravity sewer from Broadway Street, the 10-inch gravity sewer from Pacific Coast Highway, the 18-inch gravity sewer from Buccaneer Beach Park, and the 15-inch gravity sewer from Pacific Street. In addition, there are several pipelines that cut through the property to the existing Ocean Outfall Vault and will need to be re-routed in order for the City to develop the land that the Treatment Plant currently occupies. These lines includes the 24-inch Land Outfall and the 10-inch Brine Line. The abandoned 24-inch Reclamation Line also traverses through the Treatment Plant, but it will not be relocated because it is an abandoned pipeline.

Due to the complexity of the various pipelines, Figures 2-1 through 2-4 have been created to describe the phasing of the pipeline relocation. Prior to construction of the lift station. The following utilities will need to be reconstructed as described below/

Phase 1 – Figure 2-1

1. Relocate the existing 8 inch water line and construct a new 8 inch water line as shown on Pacific Street.
2. Construct the 10 inch brine line and 24 inch force main in Crosswaite St.
3. Construct the 24 inch force main in Pacific Street.

Phase 2 – Figure 2-2

1. Construct a new manhole on the existing 12 inch sewer
2. Construct a temporary bypass line from the 10 inch sanitary sewer to the 12 inch sewer.

Phase 3 – Figure 2-3

1. Remove and dispose of the existing 10 inch sewer to the South Pacific Lift Station
2. Construct the new La Salina Lift Station, load equalization tank and emergency storage tank.

Phase 4 – Figure 2-4

1. Construct the new UV stormwater treatment facility
2. Disconnect all service lines to the treatment plant.
3. Decommission the treatment plant and demolish all equipment to be removed on the treatment plant sote

2.4 STRUCTURAL CONSIDERATIONS

The main structures will be the Lift Station and the Emergency Storage/Equalization Basin. The portion of the Lift Station building will be a reinforced concrete substructure that will consist of a splitter box, a wet well and a dry well. The portion of the Lift Station that will be above grade will be a building, similar in appearance to the existing Mission Avenue Lift Station. It will have a gable roof and concrete masonry walls. It will have architecture features extracted from the Mission Avenue Lift Station and some of the structures that are in close proximity to the new lift station site. The building above grade will house electrical and telemetry equipment, an emergency generator and a restroom. The Emergency Storage/Equalization Basin will be a buried, reinforced concrete structure.

The portion of the building that is above grade will be design in accordance with the edition of the California Building Code. The structural design of the wet wells and the Emergency Storage/Equalization Basin will be performed in accordance with the ACI 350-06 Code Requirements for Environmental Engineering Concrete Structures. This is the design code published by the American Concrete Institute for the design of concrete structures that are intended to convey, store or treat water or wastewater. The requirements prescribed in this code are designed to mitigate cracking and increase the durability of these concrete structures. Risk Category IV will be used for the structural design of both the Lift Station and the Emergency Storage/Equalization Basin. Seismic forces will be determined using the ground accelerations that are specific to the proposed site, as mapped by the United States Geological Survey (USGS). Wind loads will be determined using a 110 mile per hour wind speed and Exposure D, which considers the topography of the this coastal site.

A comprehensive report geotechnical investigation report will be prepared by Leighton Consultants for the design of the proposed facilities. This report will contain recommendations for the design of the foundations and buried structures. Pile design parameters will be included in this report, if the results of the geotechnical investigation indicate that such deep foundations are required.

2.5 ELECTRICAL CONSIDERATIONS

The La Salina Plant power is fed from SDG&E medium voltage (MV) overhead line that runs along Tait Street. Currently, the plant has multiple SDG&E kWH meters on the low voltage side (480V) to feed various process areas. The Tait Street ends at the La Salina plant but the MV line continues through the plant and exists to Buccaneer Park.

For plant decommissioning, coordination with SDG&E must be performed to remove or relocate the existing MV overhead line and power poles that run through the plant. The location of the electrical transformer and which power pole lines need to be removed and relocated cannot be determined until final design electrical drawings are submitted to SDG&E.

A new 480 V, 3-phase electrical service would be required for the new lift station and UV storm water treatment facility. SDG&E will provide a single meter for the facility that includes both the lift station and storm water treatment plant. It is assumed that the Main Switch Board (MSB) will be located in close proximity to the transformer.

There are four pumps in the new lift station and the worst case scenario is that three pumps could potentially be running at any given time, especially during high wet weather flow periods. It's estimated that each pump would be approximately 150 HP and a miscellaneous load of 100 HP. The service should be sized for approximately 700

HP. The pumps will be equipped with VFDs and located in the air conditioned electrical room of the lift station. The emergency standby generator will be located inside the lift station building to minimize noise created during temporary operations and to extend the life of the equipment from exposure to the elements. An integrated diesel fuel tank will be provided as well. Since this is a critical facility, the generator will be sized for a rating of approximately 650KW and will be confirmed during final design.

The existing UV Storm Water Treatment Plant has approximately a 200 amp service and the new facility will be similarly sized. However, since the storm water plant only operates seasonally and is not a critical facility, the emergency generator will not be sized to accommodate operation of the storm water treatment plant.

The lift station and other facilities will be monitored by the local Programmable Logic Controller (PLC). Monitoring of status and alarm signals will be transmitted to the City's Supervisory Control and Data Acquisition (SCADA) system.

2.6 GEOTECHNICAL CONSIDERATIONS

Leighton Consulting conducted a geotechnical investigation of the La Salina Treatment Plant and proposed lift station site in May 2016. The geotechnical report is provided in Appendix M and the results are summarized in this section.

Geotechnical aspects of the site that should be considered in design and construction include potential for strong seismic shaking, shallow groundwater, static and seismic settlement, and presence of non-uniform materials below the proposed lift station and underground tanks.

Based on the borings and CPTs, the proposed lift station and underground tanks are expected to be underlain by Quaternary-aged younger alluvium and older alluvium or weathered bedrock of the Santiago Formation. The northern portion of the plant to be decommissioned for future development is underlain by artificial fill and younger alluvium.

Groundwater was encountered at the lift station and tank site during the field exploration at depths of 7 to 8 feet, corresponding to approximately elevation 5 feet above the mean sea level. Groundwater was not encountered in the borings drilled to a maximum depth of 11.5 feet at the northern portion of the site that is located at a higher elevation.

The use of mat foundation system is considered feasible for support of the proposed lift station and tanks provided that the potential for differential settlement is accounted for in the structural design. To reduce the potential for adverse differential settlement and to provide uniform support, Leighton recommends that the mat foundation system be underlain by a minimum of 3 feet of crushed aggregate. Soils with high moisture content are expected to be encountered during construction excavation. The soils will require special grading techniques such as air drying or mixing with drier soils prior to placement as compacted fill and the excavation bottom may require stabilization prior to fill placement. Alternatively, the lift station and tanks can be supported on a deep foundation system that extends through the younger alluvium into competent material.

Trench excavations may be supported by several methods including crossbraced hydraulic shoring, conventional shields, sheet piles, even possibly soldier piles with wood lagging. The choice should be left to the contractor's judgment since economic considerations and/or the individual contractor's construction experience may determine which method is more economical and/or appropriate.

The northern portion of the plant that will be decommissioned for future development is currently occupied by administrative buildings and several above-grade and below-grade wastewater treatment tanks. The existing below grade tanks and associated pipelines may be up to 20 to 30 feet deep in some instances. Prior to

construction, these tanks and pipelines and other subsurface improvements, including vaults and building foundations, should be removed. Cavities resulting from removal of the existing underground structures and lines should be excavated to expose competent material and properly backfilled with compacted soils.

Based on Leighton's borings, the site is mantled by artificial fill. The depth of fill appears to vary throughout the site and is expected to be relatively deep where underground tanks and vaults are present. Since no documentation was available on the artificial fill, we recommend that the undocumented existing fill within future building pads be removed to competent material and recompacted.

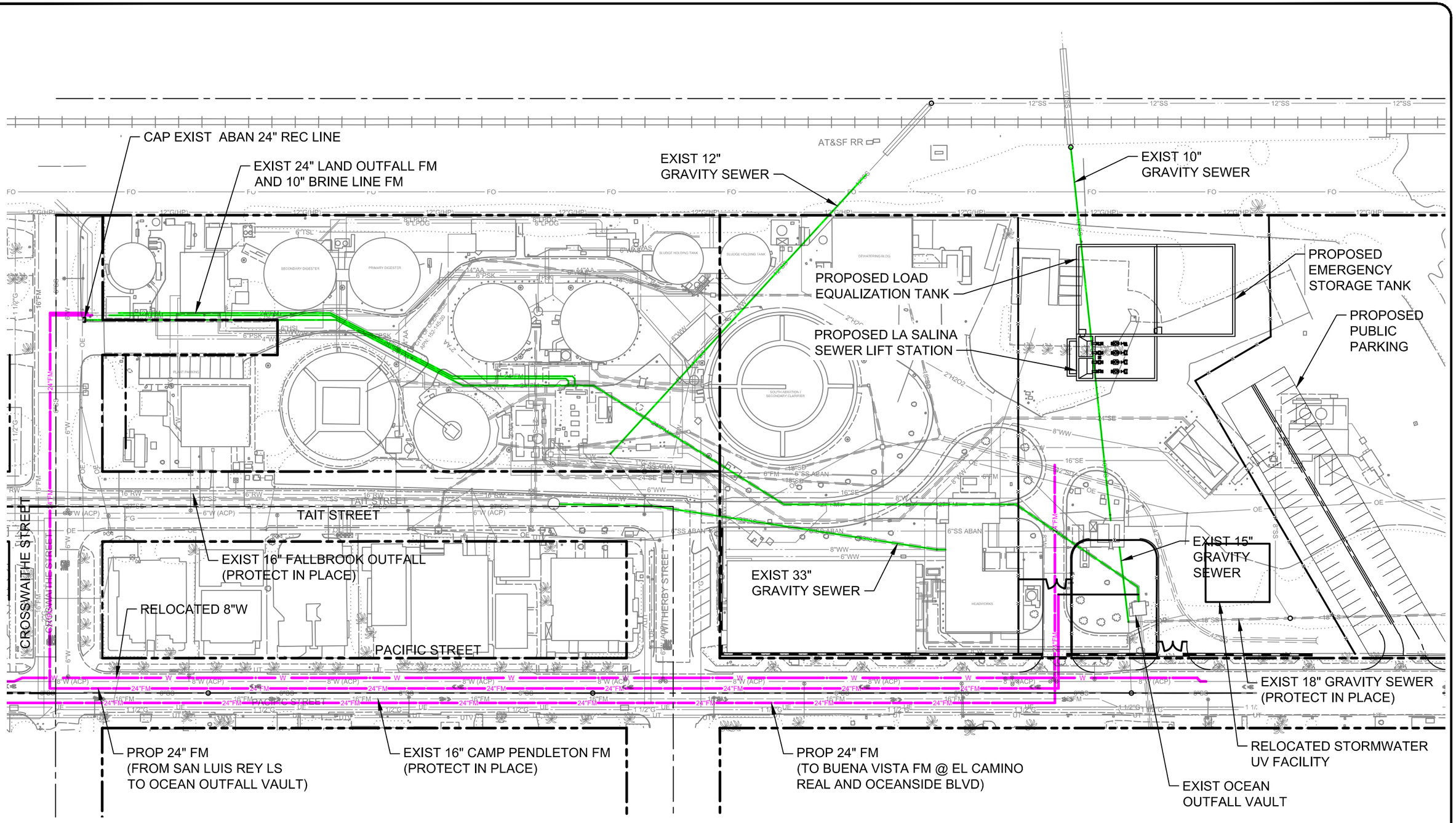
The onsite soils free of organic material or construction debris can be used as compacted structural fill to backfill the excavations and for future grading of the site. Soils excavated for construction of the proposed lift station and tanks may be stockpiled at the site for future use. From a geotechnical standpoint and with approval from the City, concrete from demolition of the existing improvements may be pulverized and blend with onsite soils, if necessary, to an appropriate gradation and used as compacted fill materials. Fill soils should be placed in loose lifts not exceeding 8 inches, moisture-conditioned as necessary to at least two percent above moisture optimum and compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method D 1557.

2.7 UV STORM WATER TREATMENT FACILITY RELOCATION

As part of the La Salina Lift Station and Plant Decommissioning Project, the City of Oceanside plans to include a public parking facility and bio buffer greenbelt area adjacent to Alta Loma Creek and south of the proposed La Salina Lift Station. As a result, the City requested that the existing UV Storm Water Treatment Facility be relocated in order to accommodate the planned space use.

The City's storm water treatment facility was constructed in 2009 and was designed to divert approximately 900 gpm of dry weather runoff flows from Loma Alta Creek to be treated and then discharged downstream of the berm to the beach. The treatment facility consists of two continuous backwash filters (Dynasand) to filter out solids, algae and other material and two ultraviolet light reactors used for disinfection of viruses and bacteria.

Tetra Tech prepared a feasibility evaluation of relocating the storm water treatment facility and is presented in Appendix M.



LEGEND:

- EXISTING PIPING TO BE RELOCATED
- PROPOSED PIPING

0 40' 80'

SCALE: 1"=80'

TETRA TECH
www.tetratech.com
17885 Von karman Ave, Suite 500
Irvine, Ca. 92614
PHONE: (949) 809-5000 FAX: (949) 809-5010

CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

RELOCATED SITE PIPING

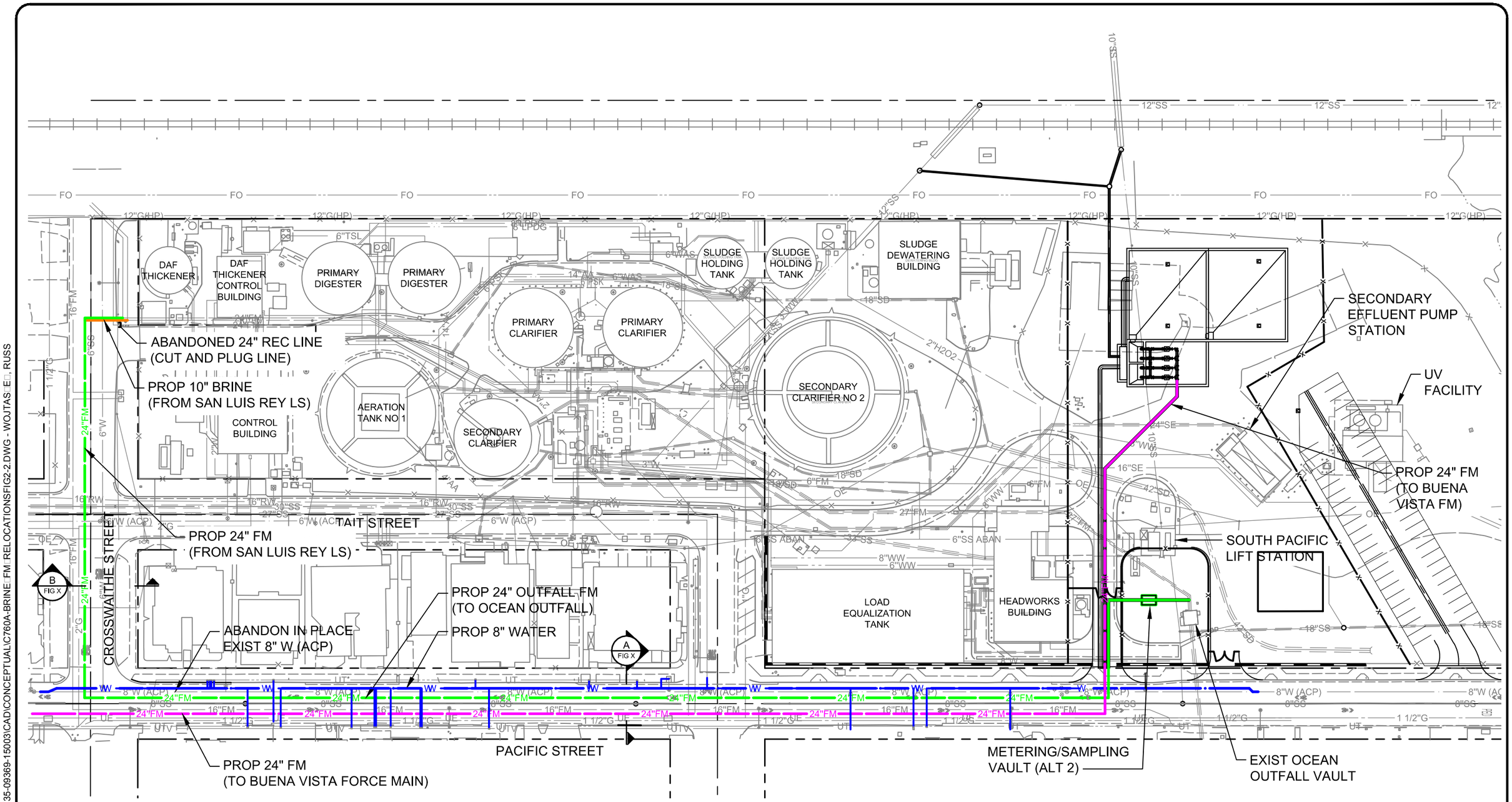
Project No.:	135-09369-15003
Date:	DECEMBER 2017
Designed By:	MBL

Figure 2-1

Bar Measures 1 inch

Copyright: Tetra Tech

12/22/2017 10:51:55 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C753-PIPELINERELOCATIONS-FIG2-1.DWG - JEN□INS, ERICA



LEGEND:

- PROPOSED 24" FM (FROM SAN LUIS REY WRF)
- PROPOSED 8" WATER (RELOCATED IN PACIFIC STREET)
- PROPOSED 24" FM (BUENA VISTA FM AT OCEANSIDE BLVD/EL CAMINO REAL)
- PROPOSED 10" BRINE (FROM SAN LUIS REY WRF & GENENTECH)

0 40' 80'

SCALE: 1"=80'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

10" BRINE AND 24" FM
RELOCATE PRIOR TO CONSTRUCTION

Project No.:	135-09369-15003
Date:	DECEMBER 2017
Designed By:	MBL
Figure	2-2

Bar Measures 1 inch

Copyright: Tetra Tech

12/22/2017 9:58:34 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C760A-BRINE_FM_RELOCATIONSFIG2-2.DWG - WOJTAS, ERIC, RUSS

EXIST 10" GRAVITY SEWER
(PROTECT IN PLACE)

CONCRETE ENCASEMENT
(82'± LF)

EXIST MH
(APPROX 4'± C)

EXIST MH
(APPROX 9'± C)

24" STL CASING
(56'± LF)

CONSTRUCT
NEW 48" MH

EXIST 12" GRAVITY SEWER
(PROTEXT IN PLACE)

TEMP BYPASS LINE

PIPE TO BE REMOVED
DURING CONSTRUCTION OF LS FACILITY

EXISTING 10" (CI)
GRAVITY SEWER

SECONDARY
EFFLUENT PUMP
STATION

UV
FACILITY

EXIST MH

SOUTH PACIFIC
LIFT STATION

EXIST 33" GRAVITY SEWER
(PROTECT IN PLACE)

LOAD
EQUALIZATION
TANK

HEADWORKS
BUILDING

OCEAN
OUTFALL
VAULT

EXIST 18" GRAVITY SEWER
(PROTECT IN PLACE)

DAF
THICKENER

DAF
THICKENER
CONTROL
BUILDING

PRIMARY
DIGESTER

PRIMARY
DIGESTER

SLUDGE
HOLDING
TANK

SLUDGE
HOLDING
TANK

SLUDGE
DEWATERING
BUILDING

PRIMARY
CLARIFIER

PRIMARY
CLARIFIER

CONTROL
BUILDING

AERATION
TANK NO 1

SECONDARY
CLARIFIER

SECONDARY
CLARIFIER NO 2

TAIT STREET

CROSSWAITHE STREET

PACIFIC STREET

0 40' 80'
SCALE: 1"=80'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

BYPASS PUMP 10" S TO 12" S
PRIOR TO CONSTRUCTION

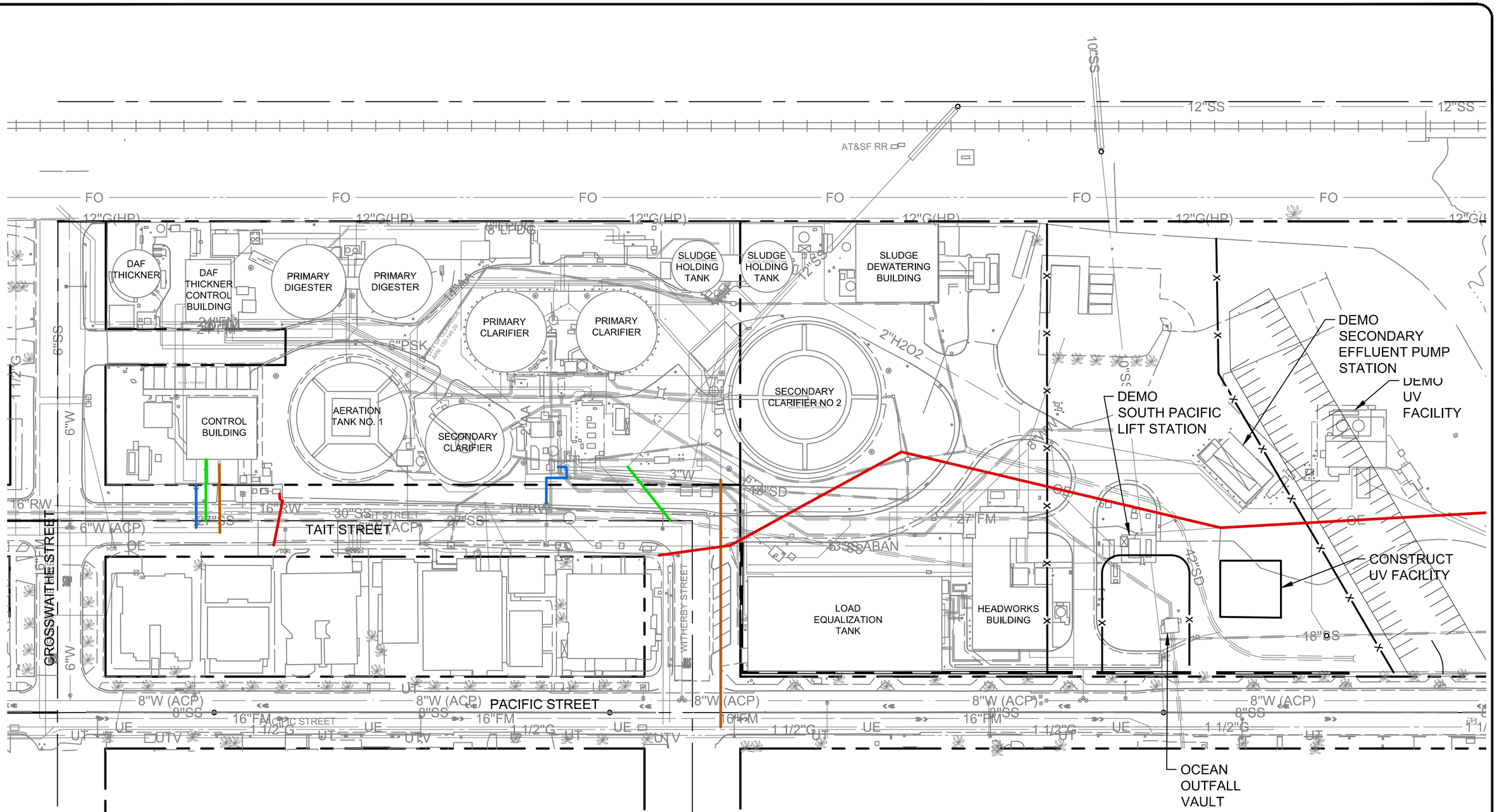
Project No.: 135-09369-15003
Date: DECEMBER 2017
Designed By: MBL

Figure
2-3

Copyright: Tetra Tech

Bar Measures 1 inch

12/22/2017 9:58:46 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C761-BRINE FM RELOCATIONSFIG2-3.DWG - WOJTAS, RUSS



LEGEND:

- WATER SERVICE
- SEWER SERVICE
- GAS SERVICE
- OVERHEAD ELECTRIC

0 40' 80'

SCALE: 1"=80'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

PLANT SERVICES TO BE DISCONNECTED AFTER LIFT STATION IS CONSTRUCTED

Project No.:	135-09369-15003
Date:	DECEMBER 2017
Designed By:	MBL

Figure 2-4

Bar Measures 1 inch

Copyright: Tetra Tech

12/22/2017 10:45:46 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C763-PIPELINERELOCATIONSFIG2-4.DWG - JENKINS, ERICA

3. ENVIRONMENTAL CONSIDERATIONS

3.1 ENVIRONMENTAL CONCERNS FOR THE DECOMMISSIONING AND DEMOLITION

In preparation for the decommissioning and demolition of the La Salina WWTP, (LSWWTP) environmental surveys were conducted to identify the presence and approximate locations of hazardous materials within the LSWWTP. These hazardous materials will be identified in the decommissioning and demolition plans and specifications to ensure that contractors bidding on the work are aware of their presence and include appropriate response measures in their proposals/bids.

Specifically, the pre-demolition surveys conducted by Tetra Tech focused on:

- Evaluating the presence and quantity of suspected asbestos-containing materials (ACM)
- Identifying the presence and quantity of lead-based paint (LBP) and lead-containing materials (LCM) at levels exceeding hazard thresholds, lead-based paint (LBP) and lead-containing materials (LCM),
- Identifying the presence of potentially hazardous materials including mercury, polychlorinated biphenols (PCBs), corrosive compounds (acidic and basic), toxic or radioactive substances,
- Locating equipment and devices that may be classified as Universal Wastes by the U.S. Environmental Protection Agency (EPA) or the California Department of Toxic Substances Control (DTSC),
- Identifying areas within LSWWTP where these materials may be found, and
- Assisting the City with the identification of items that might be salvaged for reuse at other City facilities, once the LSWWTP is taken out of service.

The following sections describe the results and conclusions of these surveys. The complete ACM, LBP/LCM and hazardous materials survey reports may be found in Appendices J, K and L.

3.2 PRE-DEMOLITION ACM SURVEY RESULTS

3.2.1 Regulation of ACM During Demolition Activities

Three primary regulations govern various activities (e.g., inspection, assessment, and abatement) relating to ACM and are enforced by federal, state and local regulatory agencies: Asbestos Hazard Emergency Response Act (AHERA) (Title 40 Code of Federal Regulations [CFR] Part 763), National Emission Standard for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61), and the Asbestos Standard for the Construction Industry, known as the Construction Standard, (codified in 29 CFR 1926.1101, and Title 8 California Code of Regulations [CCR] 1529). The U.S. Environmental Protection Agency (USEPA) regulations concerning the identification, handling, management, and abatement of ACM (as found in AHERA and NESHAP) are implemented locally by the San Diego Air Pollution Control District

(APCD). Worker health and safety regulations, including the Construction Standard are enforced by both the California Division of Occupational Safety and Health (DOSH), better known as Cal/OSHA and the federal Occupational Health and Safety Administration (OSHA). Cal/OSHA defines Asbestos Containing Construction Material (ACCM) as any building material that contains more than 0.1 percent (one-tenth of one percent) asbestos by weight. In addition, building materials presumed or known to contain at least trace amounts (not greater than 1 percent) of asbestos should be considered as ACCM and should be managed according to California regulations (as presented in Title 8 CCR 1529).

In addition, the transportation and disposal of asbestos-containing wastes are overseen by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). The federal OSHA, USEPA, DTSC, and AQMD define ACM as a material containing greater than 1 percent asbestos.

3.2.2 LSWWTP Inspection and ACM Sampling

Tetra Tech inspected the interior and exterior areas of the La Salina WWTP buildings and systems that will be disturbed during demolition. Minor demolition of materials was required during the asbestos survey effort. The inspectors took care to see that the immediate sampling areas within the La Salina WWTP buildings and systems remained unoccupied when samples were collected. Bulk samples of suspected ACM were collected during this survey. Suspected ACM were grouped as homogeneous areas if the material was similar in appearance and texture; however, the inspectors distinguished the material as unique, and collected samples of each distinct material, if they decided that a material (for example, gypsum board) was not similar in appearance and texture to other materials discovered in each building at the Site. The suspected ACM was classified in accordance with the protocol recommended in 40 CFR Part 763, Asbestos-Containing Materials in Schools; Final Rule and Notice (40 CFR 763, Subpart F). Representative bulk samples were collected from each observed homogeneous and unique material.

Bulk samples of suspected ACM were sampled with the intent that each distinct layer of material be collected. A wetting agent was applied to friable surfaces before the sample was collected to reduce the potential for fiber release. All samples were placed in plastic bags, labeled, and sealed immediately after they were collected. After each sample was collected, the sampling instruments were wiped clean using a wet, lint-free cloth to prevent cross-contamination between samples. A unique sample identification number was assigned to each sample.

3.3 RESULTS OF ACM SURVEY AND SAMPLING

3.3.1 Presumed ACM Locations

Tetra Tech inspected the interior and exterior areas of the La Salina WWTP buildings and systems that will be disturbed during demolition. Some of the LSWWTP materials were impractical to either access or collect samples from, but are likely to contain ACM at concentrations above the regulatory limits based on experience with prior, similar materials.

During the asbestos survey, Tetra Tech observed approximately 26 fire doors throughout the La Salina WWTP. Typically, it is less costly to presume that fire doors contain asbestos and it is best to dispose of them, rather than open and sample them in an asbestos-regulated enclosure. Tetra Tech recommends that all fire doors slated for replacement be handled and disposed of as potentially friable ACM. If any fire doors are slated to be retained, their insulated cores can be accessed and sampled before renovation.

Tetra Tech reviewed a partial set of drawings (Treatment Plant Yard Piping Removal, prepared by Hirsch & Company for the City of Oceanside, dated October 1982) for the La Salina WWTP. According to the reviewed drawings, waste water transite piping (ranging from 3 inches to 24 inches in diameter) is present

below ground at the La Salina WWTP. Due to access limitations, the on-Site transite piping is assumed to contain asbestos and, therefore, should be abated prior to renovation/demolition activities. The depth of the piping to be removed and anticipated construction will influence the abatement requirements for the transite pipe.

3.3.2 Confirmed ACM Locations

Sixty-eight of the 445 samples of suspected ACM collected from the Site tested positive for asbestos or were assumed positive on the basis of first-stop analysis per sample group. Each of these 68 samples contained more than 1 percent asbestos. Identified ACM included 12"x12" floor tiles, black/gray mastic, black roof felt, black/gray roof penetration mastic, black roof system core, beige window putty, and transite debris. No asbestos was identified in the remaining samples that were analyzed.

Table 3-1 provides a summary of the materials confirmed as containing asbestos, as well as presumed ACM.

The asbestos surveys employed only minor demolition of materials (destructive sampling) to minimize damage to the facility from sampling, which limited the inspection for suspect materials. Thus, additional suspect materials could be present at the Site in walls, voids, attics, crawl spaces, and other concealed areas. If any suspected ACM that are not listed in the ACM summary table (Table 3-1) are identified during the renovation/demolition processes, the owner or contractor should employ an AHERA-certified building inspector to obtain representative analytical results, or as an alternative, they should handle and dispose of these materials as presumed ACM (PACM) and follow all Federal Occupational Safety and Health Administration (OSHA) and California Occupational Safety and Health Administration (Cal-OSHA) requirements for protecting workers and building occupants.

3.4 ADDRESSING ACM FOR DEMOLITION

Non-friable ACM identified by the Tetra Tech survey should be removed as friable ACM by a licensed asbestos abatement contractor before renovation/demolition work begins. The abatement contractor will need to comply with APCD requirements (i.e., APCD Rule 361.145) including preparation and approval of work plans, agency notifications and control measures during actual removal activities. The waste must be transported to a disposal site that is able to accept non-friable ACM.

Additional suspect ACM may be present at the Site in walls, voids, attics, crawl spaces, and other concealed areas. If any suspected ACM that are not listed in the ACM summary table (Table 3-1) are identified during the demolition processes an AHERA-certified building inspector should be brought in to sample and analyze the materials to identify ACM. Alternatively, these materials may be removed, handled and disposed as presumed ACM (PACM) in accordance with ACM regulations. The full ACM survey report may be found in Attachment A of the Appendix.

3.5 PRE-DEMOLITION LBP SURVEY RESULTS

3.5.1 Regulation of LBP During Demolition Activities

The USEPA, the U.S. Department of Housing and Urban Development (HUD), and CDPH define LBP as paint containing greater than 0.5% lead by weight, or 5,000 ppm, or 1.0 mg/cm2 total lead. Federal OSHA and Cal/OSHA regulations (Lead Construction Standard) do not provide a definition for “lead-based paint,” but do refer to the USEPA, HUD, and CDPH numbers cited above. Cal/OSHA is primarily

concerned with worker protection, and it regulates any amount of lead contained within painted building components.

According to Cal/OSHA regulations (Title 8 CCR Section 1532.1), employers may assume that disturbance of coatings or materials shown to contain less than 0.06% lead by weight (or 600 ppm of lead) will not result in exposures above the applicable Action Level of 30 µg/cm3, as long as workers are not performing any of the designated trigger tasks (such as building demolition, manual sanding or scraping, abrasive blasting, etc.). All demolition work on surfaces that have lead-containing coatings must be conducted by trained personnel.

All lead-related demolition work should be conducted in compliance with Title 8 CCR Section 1532.1 regulations. Manual demolition of lead-containing building components is considered a low-level trigger task whereby exposures exceeding 50 and up to 500 micrograms per cubic meter (µg/m3) of lead can be expected. All workers performing a trigger task must follow Cal/OSHA requirements, including use of hand washing facilities, use of High-Efficiency Particulate Air (HEPA) filtered vacuums, blood lead testing prior to the project, training in the Cal/OSHA standard, and use of regulated work areas.

Concentrations of airborne lead generated by disturbing the paints and ceramic tile glazes at the Site would vary based upon several factors, including the type of activity (including "trigger tasks") and the severity of disturbance to the building materials. Determination of airborne lead concentrations would require air monitoring by a trained lead professional during building material disturbance.

Lead concentrations in soil in California are regulated by DTSC. The focus of the soil concentrations is the potential for children to ingest or otherwise exposed to the lead. The current screening level of lead in soil is 80 milligrams per kilogram of soil. Over a period of time, LBP that flakes off or is removed by sanding or similar methods may increase the concentration of lead in the soil.

3.5.2 LSWWTP Inspection and LBP and LCM Sampling

Tetra Tech surveyed suspect LBP and suspect LCM within LSWWTP between November 16, 2015 and November 23, 2015. The lead survey proceeded according to USEPA, HUD, and CDPH protocols as general guidance. The LSWWTP buildings and treatment systems were evaluated for the presence, location, and quantity of lead-based paint (LBP) and lead-containing materials (LCM) at levels exceeding hazard thresholds, which would Cal/OSHA worker safety precautions during demolition.

Tetra Tech screened representative potential LBP- and LCM-coated surfaces (including ceramic and brick tiles) for lead using a handheld x-ray fluorescence (XRF) analyzer. Lead is frequently found in multiple color paints, as well as ceramic tile, sink coatings, and floor tiles. Areas of peeling and flaky paint were observed at the La Salina WWTP. The paint was noted to be in fair to poor condition.

Tetra Tech tested the majority of interior and exterior painted and/or coated surfaces at the Site for the presence of lead utilizing a portable Niton Analyzer XRF analyzer unit. The XRF unit allows for non-destructive/non-intrusive measurements of paint up to 3/8-inch thick. Confirmation samples were collected and submitted for laboratory analysis for lead. Paint chip and bulk confirmation samples of suspect LBP and LCM were also collected during the XRF surveys. Before samples were collected, a wetting agent was applied to suspect LBP and LCM surfaces, to reduce the potential for release of dust during sampling activities. Following collection, all LBP and LCM samples were placed in clean sample containers, labeled, and sealed. After completion of sampling, the LBP and LCM samples were shipped via Federal Express, along with the chain-of-custody documentation, to the off-site, State of California Environmental Laboratory Accreditation Program (ELAP) approved laboratories.

The off-site laboratory analyzed the samples using flame atomic absorption spectrometry (AAS).

3.5.3 Results of LBP and LCM Survey and Sampling

Tetra Tech obtained 547 XRF readings (in addition to 42 XRF calibration readings ranging from 0.88 mg/cm2 to 1.13 mg/cm2) from LBP and LCM such as glazed ceramic, brick, and marble tiles that were suspected to contain lead within the LSWWTP. During Tetra Tech's lead survey, lead was detected in various amounts in a variety of building components. For this (November 16, 2015 to November 23, 2015) survey, any material containing detected lead at a concentration less than 1.0 mg/cm² is considered to be lead-containing paint (LCP).

The samples categorized as LBP/LCM include: pink/beige 4-inch square ceramic tiles, white floor sinks, white coated counter top sinks, yellow painted concrete curb, yellow painted light pole concrete base, beige/green painted metal pipes, yellow painted metal handrails and stairs, yellow painted metal posts/bollards, grey painted concrete sump walls, and yellow painted roof access metal frame.

The results of lead surveys by Tetra Tech confirmed LBP and LCM at the Site. The confirmed LBP and LCM, along with the estimated quantities of each, are summarized in Table 3-2 and should be provided to contractors and subcontractors performing work that may disturb any LBP or LCM at the Site. All demolition work that involves areas which contain LBP/LCM should be performed by a qualified lead abatement/removal contractor. All lead abatement/removal work should be supervised by CDPH-certified personnel, and work should be completed using appropriate lead work practices in accordance with California Occupational Safety and Health Administration (Cal-OSHA) and HUD guidelines.

Contractors whose employees disturb more than 100 square feet of LBP are required to submit written notification to Cal/OSHA (per Health and Safety Code, Title 17, CCR Section 36000 (c)). Cal/OSHA also requires 24-hour advance notice prior to LBP disturbance. Areas of peeling and flaky paint were observed at the LSWWTP, however the majority of the site is paved, so there are limited areas where lead could impact adjacent soil. During demolition activities, the demolition contractor will be required to control the LBP/LCM debris to avoid release to surrounding areas.

To determine disposal options for the lead-containing surfaces during renovation/demolition activities, bulk samples of the lead-containing surfaces as a whole (i.e., glaze and tile substrate) should be collected by the contractor and analyzed for total lead according to USEPA Method 3050B/7420. Debris generated during the abatement or removal of LBP or LCM is generally considered to be hazardous wastes, with the possible exception of concrete surfaces with LBP that will be recycled. Handling, storage and transportation of the demolition wastes from the abatement of the LBP/LCM should be closely coordinated with licensed hazardous waste treatment, storage and disposal facilities to ensure compliance with federal, state and local regulations. The full pre-demolition lead hazardous materials survey report may be found in Attachment B.

3.6 PRE-DEMOLITION HAZARDOUS MATERIALS SURVEY RESULTS

The hazardous materials survey should be considered a "snapshot" or point in time for the LSWWTP. The exact quantities, locations and conditions of hazardous materials observed obviously change continuously when the Plant is operating. Prior to shutting down the LSWWTP, it is anticipated that the City and LSWWTP staff will actively manage the chemicals and materials used, allowing some to be consumed or the quantities allowed to decrease to minimal levels, and other items may be physically removed or transferred to other City facilities.

However, for the purposes of the Survey, the LSWWTP was considered to be "closed" when the Plant was visited for this Survey. The materials that were observed were considered to be no longer in use for their intended purpose, making them "wastes" that the contractor would need to address as part of the decommissioning.

Devices that contain radioactive materials, (such as level monitoring devices for solids, or medical equipment) were not included in the Survey, based on the initial discussions with the City and Operations staff at LSWWTP, which indicated none of these devices are used at the Plant.

For the hazardous materials survey, the hazardous materials/wastes were broken into different classes for simplified identification. The basic classifications used were hazardous wastes and universal wastes. Examples of the hazardous wastes include oils and greases, solvents, paints, insecticides, soaps and disinfectants, roofing material, sealants, or other items remaining once the Plant is no longer operational. Universal wastes include computer monitors, televisions, fluorescent light bulbs or other similar materials.

3.6.1 Regulation of Hazardous Materials During Demolition Activities

Hazardous Wastes

When the products are no longer being used for their intended purpose, are spilled or contaminated with other materials, they become "solid wastes" as defined under the Resource Conservation and Recovery Act (RCRA) as defined under Title 40 CFR 261. A RCRA "solid waste" may include wastes that are solid, semisolid, liquid or contains gas. Materials that may be recycled or reused in another process or to make a different product, or reused as a substitute for another product are not classified as solid wastes. The state of California has hazardous waste regulations that parallel RCRA, but in some cases are more stringent. These regulations are defined under Title 22 CCR 66261.

The majority of hazardous wastes fall under one of the definitions of "Characteristic Wastes" (40 CFR 261.10 – 261.24 and 22 CCR 66261.20 – 66261.24). These hazardous characteristics are:

- Ignitability (liquid, solid, or gas, including oxidizers, that are capable of ignition or combustion) 40 CFR 261.21 or 22 CCR 66261.21
- Corrosivity (material with pH less than 2.0 or over 12.5, or that corrodes steel) 40 CFR 261.22 or 22 CCR 66261.22
- Reactivity (any material that is unstable or undergoes violent changes without detonating, reacts violently with water or forms potentially explosive mixtures with water, can generate toxic fumes when exposed to pH between 2 and 12.5, listed as an explosive, or is capable of causing detonation or explosion under specific conditions) 40 CFR 260.23 or 22 CCR 66261.23
- Toxicity (material that contains one or more chemicals at concentrations that are identified as toxic) 40 CFR 261.24 or 22 CCR 66261.24

Wastes may also be classified as hazardous if they are from non-specific sources listed in 40 CFR 261.31 or are on a list of specific sources in 40 CFR 261.32. These hazardous wastes were not considered likely to be present at LSWWTP and were not included in the hazardous waste survey.

California regulates more wastes as hazardous wastes than those regulated under the federal RCRA rules. These wastes are identified as "non-RCRA hazardous wastes" or "California hazardous wastes." Used oil is a common California hazardous waste. Appliances that are no longer useful must be disposed in

accordance with California regulations. In 2006, DTSC established a certification program for individuals and businesses that process major appliances for scrap. Before they crush or bale an appliance, these individuals and businesses are required remove certain potentially harmful materials. Effective January 1, 2006, only a Certified Appliance Recycler (CAR) may remove these materials, known as Materials that Require Special Handling (MRSH) (California Health and Safety Code 25211.2). Additional details on the disposal of used major appliances are included in the hazardous materials survey report in Attachement C.

Universal Wastes

The cathode ray tube (CRT) video display components of computers and televisions contain lead and other metals that are sufficient to require managing them as hazardous wastes once they are no longer operational. However, the EPA adopted regulations that conditionally excluded CRTs from the hazardous waste requirements, if they are recycled instead of being sent for landfill disposal (40 CFR 260.4(a)(22)).

California has developed a Universal Waste Rule to allow individuals and businesses to transport, handle and recycle certain common hazardous wastes, identified as Universal Wastes in a manner different than the requirements of most other hazardous wastes. The California hazardous waste regulations identify seven specific categories of hazardous wastes that may be managed as Universal Wastes (22 CCR 66261.9 and California Health and Safety Code section 25201.16).

The Universal Waste categories are:

- Electronic devices (Includes any electronic device that is a hazardous waste, with or without a CRT, including televisions, computer monitors, cell phones, VCRs, computer CPUs and portable DVD players.)
- Batteries (includes most household-type batteries, including rechargeable nickel-cadmium batteries, silver button batteries, mercury batteries, alkaline batteries and other batteries that exhibit a characteristic of a hazardous waste)
- Electric lamps (Fluorescent tubes and bulbs, high intensity discharge lamps, sodium vapor lamps and electric lamps that contain added mercury, as well as any other lamp that exhibits a characteristic of a hazardous waste, such as containing lead)
- Mercury-containing equipment (Thermostats, mercury switches, mercury thermometers, manometers, pressure or vacuum gauges, dilators and weighted tubing, mercury rubber flooring, mercury gas flow regulators, dental amalgams, counterweights, dampers and mercury added novelties such as jewelry, ornaments and footwear)
- CRTs (The glass picture tubes removed from devices such as televisions and computer monitors)
- CRT glass (A CRT that has been accidently broken or processed for recycling)
- Non-empty aerosol cans

According to DTSC, the treatment of aerosol cans as Universal Wastes provides a mechanism for the Generator of the waste (i.e., the City) to legally transport the aerosol cans to a licensed facility for disposal of the waste, but the cans technically remain a hazardous waste and revert to that status when they are received at the disposal facility. This avoids the need for Generator to prepare Hazardous Waste Manifests and pay for a licensed hazardous waste transporter to carry the aerosol cans to the disposal facility.

The waste non-empty aerosol can is a hazardous waste if the waste non-empty aerosol can contains pressurized contents that may be hazardous, if the propellant is ignitable or toxic, or if the product itself is ignitable, corrosive, or toxic. Aerosol cans containing paint, pesticides, and cleaning products are examples of materials that may be hazardous when discarded. Most aerosol cans use hydrocarbons, such as propane, butane, or LPG gas as the propellant. Hence, most waste aerosol cans that are not empty are ignitable hazardous wastes.

Empty aerosol cans may be disposed of as municipal trash or recycled for the metal content. The aerosol cans that are not empty (either still have some contents and/or are still pressurized) and are Universal Waste while the Plant is operational will require treatment as a hazardous waste by the demolition contractor if they are present at the Plant once it is shut down.

3.6.2 Pre-demolition Survey for Hazardous Materials

The Survey was conducted from November 16 to 20, 2015. The Survey consisted of a visual observation of the buildings, rooms, and storage areas located on the Plant. Discussions were conducted with Plant staff to help identify operations in different areas as well as to distinguish equipment that is not owned by the City. The survey of the Plant was performed in a sequential manner based on a grid pattern shown in Attachment C.

3.6.3 RESULTS OF HAZARDOUS MATERIALS SURVEY

During the Survey of the LSWWTP, a large number of items were identified that will require handling prior to or during the decommissioning of the Plant. These items are typical of any operating facility and do not indicate any unusual conditions or issues. Some items may have multiple classifications, depending on circumstances and the final disposition of those items.

Potentially Hazardous Wastes

Hazardous or potentially hazardous wastes were identified throughout the Plant during the Hazardous Materials Survey. The items consisted primarily of:

- Water treatment chemicals (flocculants, H_2O_2, hypochlorite, deodorizers)
- Aerosol cans (pressurized) containing paints, solvents, lubricants, cleansers and degreasers, pesticides,
- Containers holding oils, lubricants and greases, and flammable fuels (gasoline, diesel and propane)
- Outdoor and indoor lights and bulbs containing mercury or other hazardous materials
- Waste oils
- Mercury-containing switches or thermostats
- Soap, cleaners, detergents
- Paints and stains, solvents, tar, sealants
- Acids or other corrosive materials
- Fire extinguishers
- Various large appliances (refrigerators, microwaves, washer, dryer, space heaters, etc.)

Descriptions and details on the locations where these items were identified are presented in the hazardous materials survey report in Attachment C.

Possible PCB-containing electrical devices, including fluorescent light ballasts may be hazardous or not, (depending on the verification of the manufacturer and ballast content).

Potential Universal Wastes

Universal wastes are ubiquitous throughout work environments and LSWWTP is no exception. Universal Wastes were identified throughout the Plant during the Survey. Many of the items identified as hazardous wastes were in aerosol cans which might be classified as Universal Wastes if they were not pressurized. The items identified consisted of: aerosol cans, florescent lights, paint cans, solvents, grease, sealers, cleaners, and computer/electrical equipment. Details on these items and the locations where they were identified are included in Attachment C.

Potential Salvageable Materials

Potential salvageable materials were identified during the Survey. The materials and items identified varies but in general consist of items that have the potential for being reused. The reuse may be at another wastewater treatment facility (such as SLRWRF) or at other City facilities altogether.

For some items, the decision about reuse may be based on the age or remaining lifespan of the potentially reusable item (such as an air compressor or appliance) or the ease in moving/relocating the potentially reusable item (such as drums or containers of unopened chemicals). During the Survey, items such as mechanic tools (wrenches, saws, hoists, etc.) and golf-cart style and bicycle transportation were not included.

The potentially salvageable items consisted primarily of:

- Electronic equipment (including computers, printers, monitors, television and video devices, microwave communication system, etc.),
- 2-way radios with charging stations and extra batteries,
- Safety and medical equipment such as the defibrillator and first aid boxes, emergency lights and protective equipment,
- Fire extinguishers,
- Excess unopened chemicals, solvents, sealers, paint, aerosol cans (such as solid chlorination tablets, containers of deodorants and sanitizers, totes, 5-gallon oil buckets, 55-gal drums of various materials, cleaners, etc.),
- Appliances used by the Plant operators (microwave, stove, refrigerators [excluding the lab sample refrigerator]),
- Diesel Generators and associated diesel fuel tanks,
- Welding equipment including torches, equipment, and compressed gas tanks in good repair,
- Portable generators and air compressors, tools,
- Battery operated equipment (drills, saws, etc.),
- Tubes of silicone caulking, and
- Small, portable propane tanks.

The hazardous materials survey identified areas throughout the LSWWTP where various hazardous materials are located. These materials will require classification by waste type for subsequent removal prior to the start of the decommissioning and demolition of the Plant. The quantities of materials identified during this survey are considered to be normal levels for the Plant, but obviously will vary over time and operating conditions.

3.7 APPLICATION OF THE HAZARDOUS MATERIAL SURVEY RESULTS

The overall intent of the ACM, LBP/LCM and hazardous materials surveys was to provide a baseline of the areas and materials within the Plant that will require the demolition/decommissioning contractor to address them at the start of their field work. The locations and potential quantities identified during the surveys will be included in the plans and specifications for the demolition and decommissioning of the LSWWTP.

The contractor will be required to include specialized personnel (and/or subcontractors) with the necessary licenses, training and equipment for addressing and removing the environmental issues and hazardous materials identified, and compliance with the specific regulatory requirements for the different materials. Once these materials and issues are addressed/remediated, the decommissioning and demolition of the plant may proceed. However, if additional hazardous materials are identified during the demolition activities, further remediation may be required. The identification of these areas during the contractors' bid and proposal stage will ensure that they are aware of the environmental issues and factor appropriate responses into their proposals.

In anticipation of the decommissioning and demolition of the LSWWTP, there are a number of actions that may be started during the planning of the demolition and decommissioning effort to simplify and reduce the ultimate costs for the planned project. These actions are described in Attachment C. While some actions do not eliminate the hazardous materials, the identification and classification of the materials, and relocation of the reusable or salvageable materials to another City facility or direct removal of the wastes by the City (for Universal Wastes) is likely to be a lower cost alternative than the disposal by the demolition contractor during the decommissioning.

A significant number of materials and items were identified that might still be useful or useable following the Plant closure. Those items that are not suitable for salvage and reuse, will require handling as either Universal Wastes, or following the Plant closure, likely as hazardous wastes.

Chemicals are not considered to be a waste if they can still be used for their original purpose by another facility. Items such as propane cylinders, calibration gases, and unopened containers of caulking, oil, paint and chemicals are all potentially salvageable for other facilities.

Many of the electronic devices (computers, monitors, radios, battery chargers, etc.) may be reusable elsewhere. Equipment like air compressors and tools have multiple opportunities for continuing use. Some equipment, such as the diesel generators may be reused or possibly sold if they are in good condition and are not needed elsewhere within the City.

Appliances may be reused if they are within their normal service life. Some of them may be donated to charitable organizations if the City does not have another facility that could use them.

Table 3-1
Summary of Confirmed ACMs and Presumed ACMs
Based Upon Results of Tetra Tech's Asbestos Survey

Suite	Sample ID	Material Description	Material Locations	Analytical Result	Quantity (SF)
Administration/Control Building	001-1-VFT	Beige Speckled 12"x12" VFT	Office, Breakroom/ Kitchen, and Hallways	6% Chrysotile	500
	001-1-Mastic	Black Mastic under Beige Speckled 12"x12" VFT	Office, Breakroom/ Kitchen, and Hallways	10% Chrysotile	Included Above
	002-1-Mastic	Black Mastic under Gray Speckled 12"x12" VFT	Electrical Room	5% Chrysotile	330
	016-1-Felt 2	Black Roof Core	Roof System	20% Chrysotile	2,500
	018-1	Black Penetration Mastic	Roof System	2% Chrysotile	100
WAS Thickener Building	005-1-Roofing 1	Black Roof Core	Roof System	15% Chrysotile	2,500
	005-1-Felt	Black Roof Core	Roof System	25% Chrysotile	Included Above
	006-1-Felt 1	Black/Gray Parapet Wall Core	Roof System	25% Chrysotile	1,300
	007-2	Black Penetration Mastic	Roof System	10% Chrysotile	25
North Aeration	003-1	Beige/Gray Pump Valve Gasket	Outside Water Pump Valve	40% Chrysotile	10
	005-1	Black/Gray Penetration Mastic	Pump Room Roof System	10% Chrysotile	10
Blower Building	016-2	Black Penetration Mastic	Roof System	3% Chrysotile	20
Abandoned Primary Digester (APD)	018-1	Window Beige Putty	APD Aboveground Storage Tank	2% Chrysotile	30 LF
	021-1	Black Penetration Mastic	APB Roof System	10% Chrysotile	20
Sludge Dewatering Building (SDB)	002-1-Mastic	Black/Grey Penetration Mastic	Roof System	10% Chrysotile	400

Table 3-1
Summary of Confirmed ACMs and Presumed ACMs
Based Upon Results of Tetra Tech's Asbestos Survey

Load Equalization Tank (LET)	001-1	Grey Sealant Mastic	LET Northeast Corner, Sump Box Cover	15% Chrysotile	25 LF
	003-1	Grey Penetration Mastic	LET Northeast Corner, Air Vent Base	12% Chrysotile	16
South Pacific Pump Station	002-1	Black/Grey Mastic	South Pacific Pump Station Room Skylight	15% Chrysotile	10
South End of Plant	001-1	Grey Cementitious Material/ Transite Debris	South End of Plant	15% Chrysotile, 3% Crocidolite	1 LF
La Salina WWTP	--	3" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	150 LF
La Salina WWTP	--	4" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	300 LF
La Salina WWTP	--	6" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	1,800 LF
La Salina WWTP	--	12" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	200 LF
La Salina WWTP	--	14" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	60 LF
La Salina WWTP	--	16" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	50 LF
La Salina WWTP	--	24" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	600 LF
La Salina WWTP	--	Fire Doors	Multiple Locations	Presumed ACM	26 Doors

Notes and Abbreviations:

The linear length (feet) of pipe should be considered as a rough estimate only.
-- = Not Sampled
ACM = Asbestos-Containing Material
ID = Inner Diameter
LF = Linear Foot
SF = Square Foot
VFT = Vinyl Floor Tile

Table 3-2
Summary of Confirmed LBP and LCM
Based Upon Results From Tetra Tech's Lead Survey

Suite No.	Component	Substrate	Color	Results	Pb (mg/cm^2)	Comments	Quantity
Administration/ Control Building	4" Ceramic Tile Wall	Ceramic	Pink/ Beige	Positive	9.09	Ceramic tile in east restroom	110 SF
	4" Ceramic Tile Wall	Ceramic	Brown	Positive	8.49	Ceramic tile in east shower room east wall	80 SF
	4" Ceramic Tile Wall	Ceramic	Pink/Beige	Positive	8.63	Ceramic tile in east shower room south wall	80 SF
	4" Ceramic Tile Wall	Ceramic	Pink/Beige	Positive	8.70	Ceramic tile in east shower room west wall	Included above
	Floor Sink	Porcelain	White	Positive	7.17	Floor sink in janitor closet	1 Sink
	4" Ceramic Tile Wall	Ceramic	Pink/ Beige	Positive	9.21	Ceramic tile in west restroom north wall	110 SF
	4" Ceramic Tile Wall	Ceramic	Pink/ Beige	Positive	8.75	Ceramic tile in west restroom east wall	Included above
	Restroom Counter Sink	Metal	White	Positive	8.5	West restroom counter sink	1 Sink
	4" Ceramic Tile Wall	Ceramic	Pink/ Beige	Positive	8.86	Ceramic tile in west restroom west wall	Included above
	Sidewalk	Concrete	Yellow	Positive	1.08	Pedestrian walkway northeast of the administration/control building	100 LF
Secondary Digester	Light Pole Base	Concrete	Yellow	Positive	3.22	Light pole located north of the secondary digester above AST	10 SF
	Light Pole Base	Concrete	Yellow	Positive	2.89	Light pole located south of the secondary digester above AST	10 SF
Primary Digester	Light Pole Base	Concrete	Yellow	Positive	3.23	Light pole located west of the primary digester above AST	10 SF

Table 3-2
Summary of Confirmed LBP and LCM
Based Upon Results From Tetra Tech's Lead Survey

	12" Pipe	Metal	Beige	Positive	1.90	Waste water pipe west of the primary digester AST	20 LF
North Aeration	12" Pipe	Metal	Beige	Positive	2.47	Waste water 12" metal pipe north side	180 LF
	12" Pipe	Metal	Beige	Positive	4.62	Waste water 12" metal pipe east side	Included above
	12" Pipe	Metal	Beige	Positive	4.25	Waste water 12" metal pipe south side	Included above
	12" Pipe	Metal	Beige	Positive	4.14	Waste water 12" metal pipe west side	Included above
Air Blower	Light Pole Base	Concrete	Yellow	Positive	1.84	Light pole located west of the air blower building	10 SF
North Secondary Clarifier	Light Pole Base	Concrete	Yellow	Positive	1.33	Light pole located east of the north secondary clarifier	10 SF
	Light Pole Base	Concrete	Yellow	Positive	2.13	Light pole located west of the hydrogen peroxide AST	10 SF
BG Chamber	Handrail	Metal	Yellow	Positive	9.17	Metal handrail around B.G. chamber, north side	150 LF
	Handrail	Metal	Yellow	Positive	9.24	Metal handrail around B.G. chamber	Included above
	Handrail	Metal	Yellow	Positive	9.03	Metal handrail around B.G. chamber	Included above
RWP Station	Bollard	Metal	Yellow	Positive	2.87	Metal bollard east of the RWP station	5 LF
	Light Pole Base	Concrete	Yellow	Positive	1.09	Light pole located west of the process water AST	10 SF
	Bollard	Metal	Yellow	Positive	1.31	Metal bollard located south of the RWP station	5 LF
	2" Handrail	Metal	Yellow	Positive	1.32	Sump metal handrail south of the RWP	50 LF

Table 3-2 Summary of Confirmed LBP and LCM Based Upon Results From Tetra Tech's Lead Survey							
North Primary Clarifier	Light Pole Base	Concrete	Yellow	Positive	1.98	Light pole located east of the north primary clarifier	10 SF
South Primary Clarifier	Stairs	Concrete	Yellow	Positive	4.47	Concrete stairs located north of the south primary clarifier	30 SF
Abandon Primary Digester (APD) AST	Bollard	Metal	Yellow	Positive	1.74	Metal bollard located west of APD AST	5 LF
Sludge Dewatering Building (SDB)	Roof Access Frame	Metal	Yellow	Positive	1.24	Roof access metal frame	30 SF
	Stairs	Metal	Yellow	Positive	3.68	Concrete stairs with metal treads located south of SDB	50 SF
South Aeration	Stair Handrail	Metal	Yellow	Positive	1.33	Metal handrail located north of South Aeration	40 SF
Secondary Clarifier	12" Pipe	Metal	Beige	Positive	3.77	Metal pipe north of the south aeration	180 LF
	12" Pipe	Metal	Beige	Positive	3.74	Metal pipe east of the south aeration	180 LF
	Light Pole Base	Concrete	Yellow	Positive	3.42	Light pole located south of the secondary clarifier	10 SF
	12" Pipe	Metal	Beige	Positive	2.62	Metal pipe south of the south aeration	180 LF
	4" Pipe	Metal	Beige	Positive	1.48	4" metal pipe support south of the south aeration	60 LF
	4" Pipe	Metal	Beige	Positive	2.53	4" metal pipe support south of the south aeration	60 LF
Headworks Building	Bollard	Metal	Yellow	Positive	1.94	Metal bollard located north of the headworks building	30 LF
	Bollard	Metal	Yellow	Positive	2.71	Metal bollard located north of the headworks building	30 LF

Table 3-2
Summary of Confirmed LBP and LCM
Based Upon Results From Tetra Tech's Lead Survey

South Pacific Pump Station	Stairs	Concrete	Yellow	Positive	1.99	Yellow paint on concrete stairs in basement	40 SF
	Electric Panel	Metal	Yellow	Positive	1.57	Electric panel located south of the south pacific pump station	50 SF

Notes:
LF = linear foot
mg/cm^2 = milligrams per square centimeter
Pb = lead
SF = square foot
AST = aboveground storage tank

4. RECOMMENDATIONS

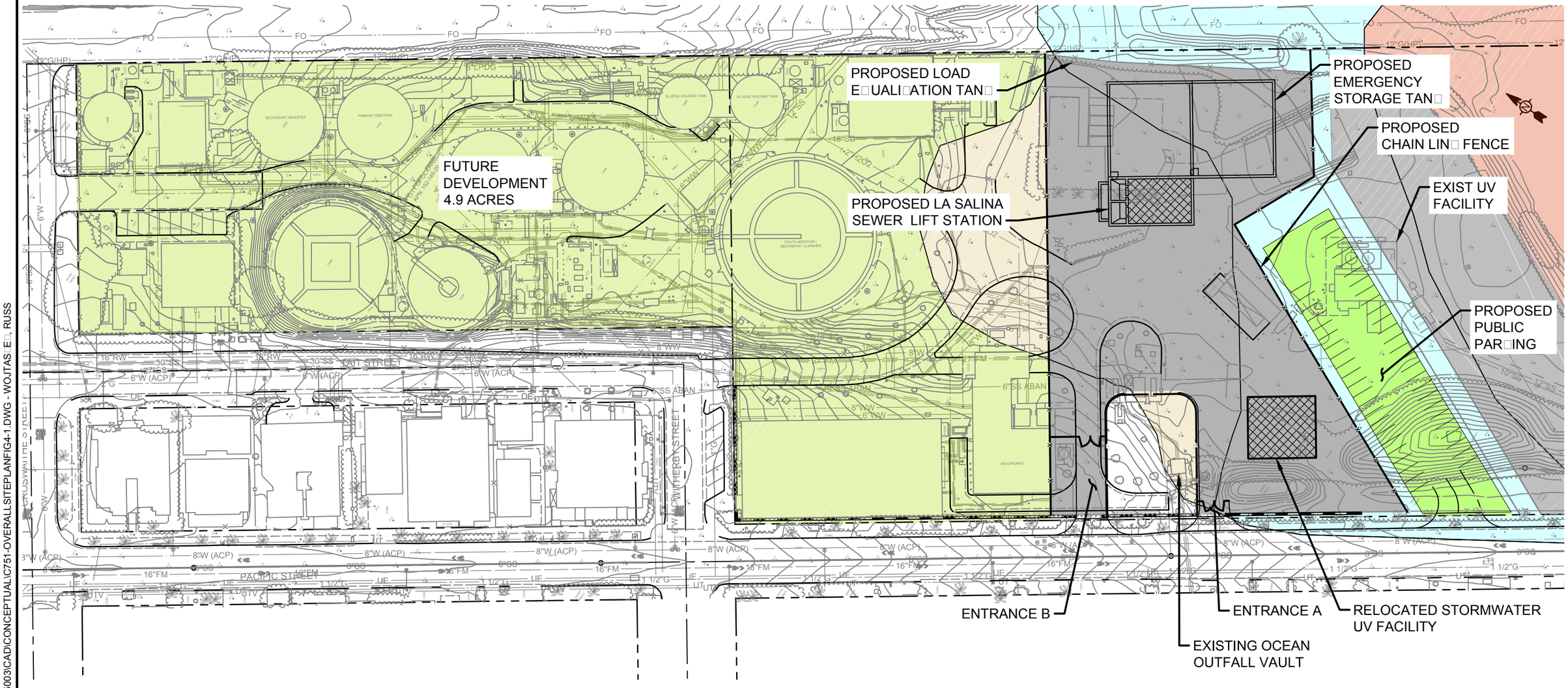
4.1 RECOMMENDED PROJECT

A design flow rate of 5.5 MGD (3820 gpm) will be pumped from the La Salina Lift Station through a new 20-inch, inside diameter force main and tie into the existing the Buena Vista Pipeline at the intersection of Oceanside Boulevard and El Camino Real. The Oceanside Boulevard and Mesa Drive gravity flows will be re-routed to the Mission Lift Station. The design flow rate of 5.5 MGD (3,820 gpm) will require the use of a load equalization tank to attenuate peak flows in addition to an emergency storage basin. The new load equalization tank has been preliminary sized at 600,000 gallons. This volume in combination with the 500,000 gallons of emergency storage would result in a total on-site storage volume of 1.1 million gallons. Due to the large volume of sewage in the load equalization tank, some type of mechanical or compressed air mixing, along with odor control facilities may be required. A more detailed review will be provided in final design.

This project consists of preliminary and final design services for the demolition of the LSWWTP and replacing it with a new raw wastewater pump station to convey wastewater from the LSWWTP collection area to San Luis Rey Water Reclamation Facility (SLRWRF). The additional flows to the SLRWRF will also benefit future reclaimed water treatment expansion and indirect or direct potable reuse near the Mission Basin Desalting Facility. Figures 4-1 and 4-2 present the overall site plan for the new lift station and associated project facilities. The lift station plan and section drawings are presented in Figures 4-3 through 4-5 in Appendix I.

Key features of the project will include the following:

- *Decommissioning of the existing La Salina Plant Wastewater Plant.* Once the new lift station is operational, the existing treatment plant (tanks, structures, equipment, some below grade piping, etc) will be demolished and the site will be graded with appropriate drainage facilities to accommodate for future development.
- *Construct new raw wastewater La Salina lift station.* The new lift station will consist of a wet well and dry well pump station with a total of 4 pumps. The wet well will have two compartments to allow one to be taken out of service for maintenance and cleaning while still maintaining lift station operation. The pumps will include redundancy and sized for two pumps to handle the design flow rate. A below grade rectangular concrete load equalization tank and emergency storage basin will be constructed to store incoming peak flows as well as to provide storage for emergency shut downs such as force main repair or power outage. The total capacity of the storage basins is about 1.1 million gallons. The lift station building will also contain a standby generator, surge tank and odor control facilities.
- *Construct a new 24 inch HDPE pipe (20 inch ID diameter) force main discharge pipeline*. The original intent of the project was to re-purpose an existing 16 inch Fallbrook recycled water pipeline that would be used to pump raw sewage from La Salina to the SLRWRF. However, following an evaluation of the force main condition, age of the line and system hydraulics, it was decided to construct a new force main discharge line. Various alignments were evaluated and it was determined that the new force main would traverse down Oceanside Boulevard and tie-in to the existing Buena Vista Pipeline at the intersection of Oceanside Boulevard and El Camino Real for conveyance to the SLRWRF.



LEGEND:

- FEMA FLOOD □ONE X
- FEMA FLOOD □ONE AE
- FEMA FLOOD □ONE AE FLOOD WAY
- PROPOSED AC PAVING LIMITS
- PROPOSED PUBLIC PAR□ING
- FUTURE DEVELOPMENT
- BIO BUFFER
- PROPOSED BUILDING
- PROPOSED FENCING
- RIGHT OF WAY
- EXIST BLOC□ WALL

0 40' 80'

SCALE: 1" = 80'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

OVERALL SITE PLAN

Project No.:	135-09369-15003
Date:	DECEMBER 2017
Designed By:	MBL

Figure 4-1

Bar Measures 1 inch

Copyright: Tetra Tech

12/22/2017 10:21:10 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C751-OVERALLSITEPLANFIG4-1.DWG - WOJTAS, E□, RUSS

PROPOSED LOAD E□UALI□ATION TAN□

PROPOSED LA SALINA SEWER LIFT STATION

PROPOSED EMERGENCY STORAGE TAN□

LOMA ALTA CREEK

EXIST UV FACILITY

PROPOSED CHAIN LIN□ FENCE

100' BIO BUFFER

PROPOSED 15' BI□E PATH AND 5' SIDEWAL□

PROPOSED PUBLIC PAR□ING

ENTRANCE B WITH ACCESS GATE

ENTRANCE A WITH ACCESS GATE

EXISTING OCEAN OUTFALL VAULT

RELOCATED STORMWATER UV FACILITY

ADDITIONAL WATER UTILITIES DEPARTMENT FACILITIES

PACIFIC STREET

LEGEND:

- FEMA FLOOD □ONE X
- FEMA FLOOD □ONE AE
- FEMA FLOOD □ONE AE FLOOD WAY
- PROPOSED AC PAVING LIMITS
- PROPOSED PUBLIC PAR□ING
- FUTURE DEVELOPMENT
- BIO BUFFER
- PROPOSED BUILDING
- PROPOSED FENCING
- EXIST BLOC□ WALL
- RIGHT OF WAY

SCALE: 1" = 60'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

LA SALINA LIFT STATION SITING AND ACCESS PLAN

Project No.: 135-09369-15003
Date: DECEMBER 2017
Designed By: MBL
Figure 4-2

Bar Measures 1 inch

Copyright: Tetra Tech

12/22/2017 10:21:31 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C752-LIFTSTATIONPLANFIG4-2.DWG - WOJTAS□E□, RUSS

- *Structures.* The portion of the Lift Station that will be above grade will be a building, similar in architectural appearance to the existing Mission Avenue Lift Station. It will have a gable roof and concrete masonry walls. The building above grade will house electrical and telemetry equipment, an emergency generator and a restroom. The Emergency Storage and Load Equalization Basin will be a buried, reinforced concrete structure. The site will include lighting and perimeter fencing and a separate entrance and exit.
- *Storm water Treatment Facility Relocation.* There is an existing storm water treatment facility that treats dry weather flows from the adjacent Loma Alta Creek through screening, sand filtration, and ultraviolet light disinfection. Treated water is discharged back to the creek. The City's redevelopment plans for this area necessitate relocating the storm water treatment facility. Two options were considered included relocating it closer to the new raw sewage lift station, and the second option consists of an expanded lift station building that would incorporate the filtration and disinfection equipment.

4.2 PROJECT COST ESTIMATE

A preliminary construction cost estimate was prepared for the new La Salina Lift Station and is presented in Table 4-1. Construction costs consist of site work, mechanical equipment, pumps, odor control, piping, valves, structural, electrical and instrumentation. Bonds and insurance have been included at 2% and contractor's overhead and profit is assumed to be 15%. A 20% construction cost contingency is included for this preliminary design stage. As indicated the estimated construction cost is $16.6 million.

Table 4-1
Preliminary Estimated Construction Costs
La Salina Lift Station and Plant Decommissioning Project

Item	Quantity		Unit Cost		Cost ($)
Mobilization/Demobilization	1	LS	75,000	LS	75,000
Earthwork and Grading	5,000	CY	15	$/CY	75,000
Site Paving	32,000	SF	6	$/SF	192,000
Site Fencing (Assumes Chain Link Fence)	1,400	LF	15	$/LF	21,000
Misc Site Work - drainage, lighting, etc	1	LS	25,000	LS	25,000
Miscellaneous Site piping	1	LS	50,000	LS	50,000
Load Equalization and Emergency Storage Tanks/Wet Well	1	LS	3,875,000	EA	3,875,000
Sewage Pumps	4	EA	250,000	LS	1,000,000
In-line grinders	4	EA	75,000	LS	300,000
Pump Station Building (Assumes CMU Building)	1,400	SF	450	$/SF	630,000
Odor Control Equipment	1	LS	350,000	LS	350,000
Site Piping Gravity Sewer Influent - 10"	170	LF	220	$/LF	7,700
Site Piping Gravity Sewer Influent - 12"	310	LF	240	$/LF	75,600
Site Piping Gravity Sewer Influent - 15"/18"	350	LF	260	$/LF	19,500
Site Piping Gravity Sewer Influent - 33"	880	LF	400	$/LF	320,000
Site Piping Discharge Force Main - 24" New	425	LF	400	$/LF	106,000
Site Piping Storm Drain 18"	940	LF	300	$/LF	225,000
Site Piping Storm Drain 42"	230	LF	600	$/LF	138,000

Land Outfall Force Main - 24"	1,250	LF	500	$/LF	625,000
RW line (former brine line) - 10"	1,250	LF	240	$/LF	376,800
Relocate 8" Water in Pacific St	1,000	LF	200	$/LF	200,000
Painting and Coatings	1	LS	140,000	LS	140,000
Electrical MCCs, VFD, Transformer, Conduit and Wiring	1	LS	1,200,000	LS	1,200,000
Instrumentation and Controls	1	LS	100,000	LS	100,000
Emergency Standby Generator	1	EA	600,000	EA	600,000
Shoring	1	LS	1,000,000	LS	1,000,00
Dewatering	1	EA	100,000	LS	100,000
Subtotal					11,826,600
Contingencies @ 20%					2,365,320
Subtotal					14,191,920
Bonds and Insurance @ 2%					284,000
Contractors Overhead and Profit @ 15%					2,128,800
Total Estimated Construction Costs					**16,604,720**

Table 4-2 was prepared which includes all of the proposed project summary costs including construction of the new lift station, relocated UV Stormwater Treatment Facility, demolition of the existing wastewater treatment plant and other on-site structures, temporary bypassing during construction, construction of the new La Salina force main along Oceanside Boulevard, and miscellaneous on-site features such as the bio buffer area and public parking facilities. The overall project cost is estimated at $52.6 million.

Table 4-2
Project Summary Costs

Project Component	Cost ($)
La Salina Lift Station	$16.6 M
New Force Main from La Salina to Buena Vista Force Main	$16.6 M
Relocation and Reconstruction of Stormwater UV Treatment Plant	$ 3.0 M
Bio Buffer Landscaping	$0.12 M
Public Parking Lot	$0.16 M
La Salina Plant Decommissioning	$15.0 M
Temporary Bypass Plan	$ 1.1 M
Subtotal	**$52.6 M**

Appendix A. Technical Memorandum - Existing 16-inch Fallbrook Outfall Condition Assessment Approach

TETRA TECH

DRAFT

Memorandum

Date:	December 8, 2015		
To:	Amy Czajkowski		
Cc:	Shawnele Morelos		
From:	Mark Bush, P.E.		
Project:	La Salina Lift Station and Plant Decommissioning	***Project Number:***	135-09369-15003
Subject:	Existing 16-inch Fallbrook Outfall Condition Assessment Approach		

The existing 16-inch Fallbrook Outfall currently conveys secondary treated water from the Fallbrook Public Utility District (FPUD) Treatment Plant No.1. As part of the La Salina Lift Station and Plant Decommissioning Project, the existing Fallbrook Outfall is to be repurposed to convey raw sewage from the new lift station to San Luis Rey Wastewater Treatment Plant. The flows within the Fallbrook Outfall will transferred into the existing Oceanside 24-inch Land Outfall near Pala Road due to the land outfall having excess capacity. Prior to the City of Oceanside taking over ownership of the Fallbrook Outfall, the City is conducting a condition assessment of the pipeline. This memorandum summarizes our review of the existing pipeline documentation and our recommendations for performing the condition assessment.

Summarized herein is our review of the existing outfall record drawings. The existing 16-inch outfall pipeline was constructed in the early 80's. The pipeline material is Class 50 ductile iron pipe. Based on information obtained from current manufacture's catalogs, this represents a pipe wall thickness of 0.34-inches. Per the record drawings, the pipeline is polylined at highpoints. There is no indication from the plans on the lining system beyond these limits, but the assumption would be cement mortar lining. We assume that the transition to the polyline system at highpoints was to mitigate potential sulfuric gas attack of the cement lining system. The mainline isolation valves are plug valves. The model and type of air and vacuum valves are not specified.

When conducting a condition assessment the following criteria is being considered:

1. Condition of pipe wall - determine the remaining pipe wall thickness
2. Condition of the exterior
    a. Evaluate if the exterior of the pipe is experiencing the effects of corrosion and identify if pitting is occurring
    b. Evaluate how the pipe was installed (e.g. polyethylene baggy, bedding material, external coating, etc)
3. Condition of the interior
4. Condition of the gaskets
5. Condition of the appurtenances (valves, air/vacs, etc)

The pipeline is currently in use and therefore non-destructive means need to be utilized in order to evaluate the condition of the pipe. We are proposing that the pipe be excavated and exposed, and then have the pipe wall

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thickness measured through the use of ultrasonic testing. The equipment transmits soundwaves that are then measured and the metal pipe wall thickness can be inferred from the measurements. In addition, when the pipe is exposed the condition of the pipe exterior, the bedding material, and the polyethylene baggy, if installed, can be visually observed.

In order to determine potential excavation locations we reviewed the following:

1. Pipeline profile (high and low points)
2. Groundwater elevations
3. Soil corrosivity

Shown on Figure 1 is the outfall pipeline alignment and the groundwater elevations along the alignment. The groundwater elevations were obtained from Leighton Consulting, the geotechnical consultant on the project, and were based on records from previous work conducted within the area. The groundwater elevations were then compared to the elevation of the pipeline. Based on the review of this data, the pipeline was installed above the groundwater elevation and is not experiencing a wet and dry cycling that would tend to contribute and/or accelerate corrosion of the exterior of the pipeline. In addition, Leighton Consulting has concluded that the soils within the general area are not severely corrosive to metals.

Based on the review of the data and trying to determine potential points of excavation we recommend the following:

1. Excavate the pipe at a location along the northerly portion of the alignment and at the southerly portion of the alignment to assess the different geographical conditions as well as vicinity to the ocean
2. Excavate the pipe at a location within the polylining system and at a location where the standard (assumed CML) system was used

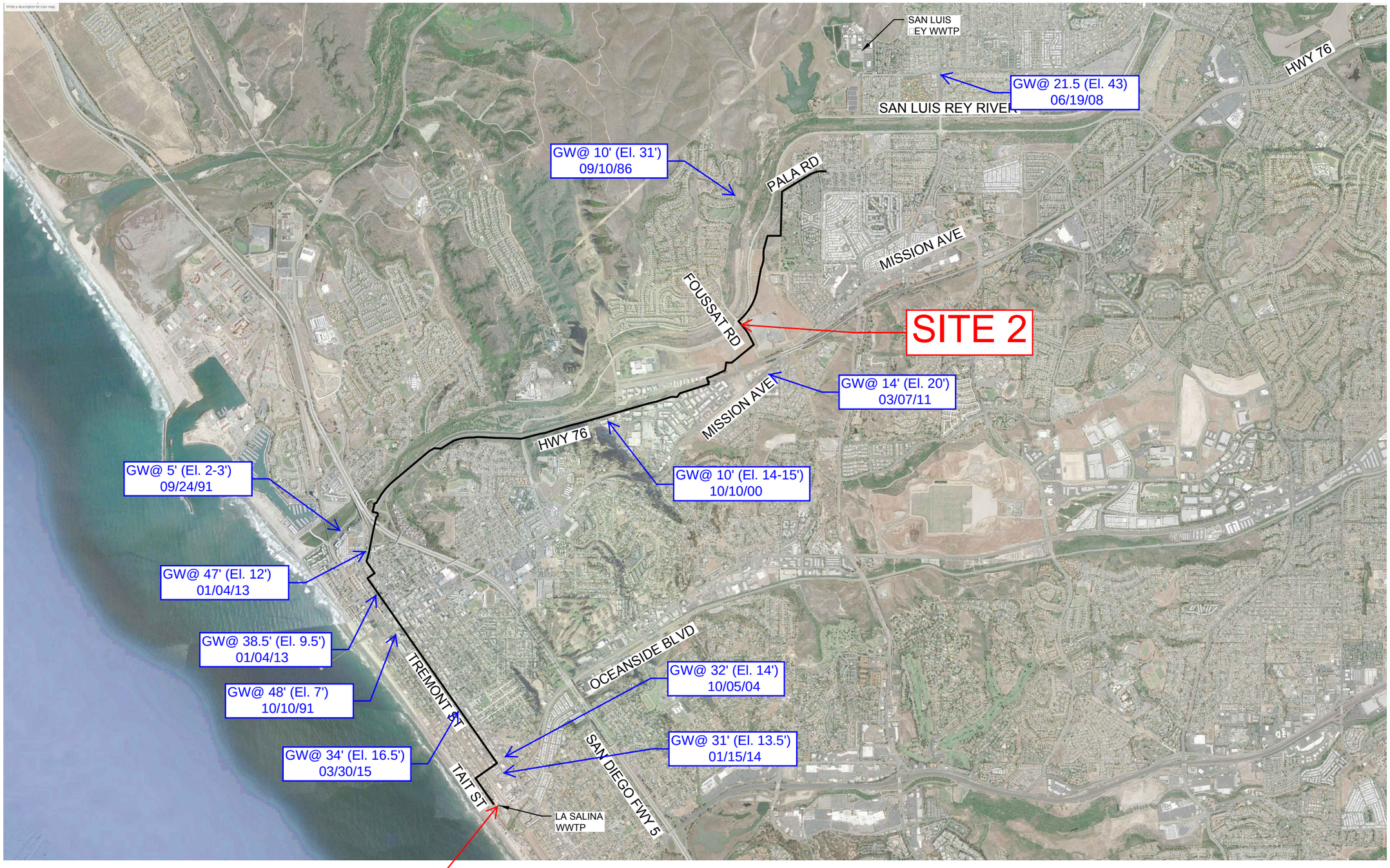
We show the general location of the two (2) excavations on the attached figures.

As for the appurtenances, we recommend the City review operation and maintenance records and have the valves operated to confirm performance. There is no reliable way to check the performance of the gaskets except to conduct a pressure test, which means taking the outfall out of service.

We look forward to discussing this issue in additional detail with you. Please do not hesitate to contact me at 949-809-5157 should you desire to discuss this in further detail.

MWB/mag

Attachments



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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

16" FALLBROO□ OUTFALL

Project No.:	135-09369-15003
Date:	NOV 2015
Designed By:	EV

Figure 1

Bar Measures 1 inch

Copyright: Tetra Tech

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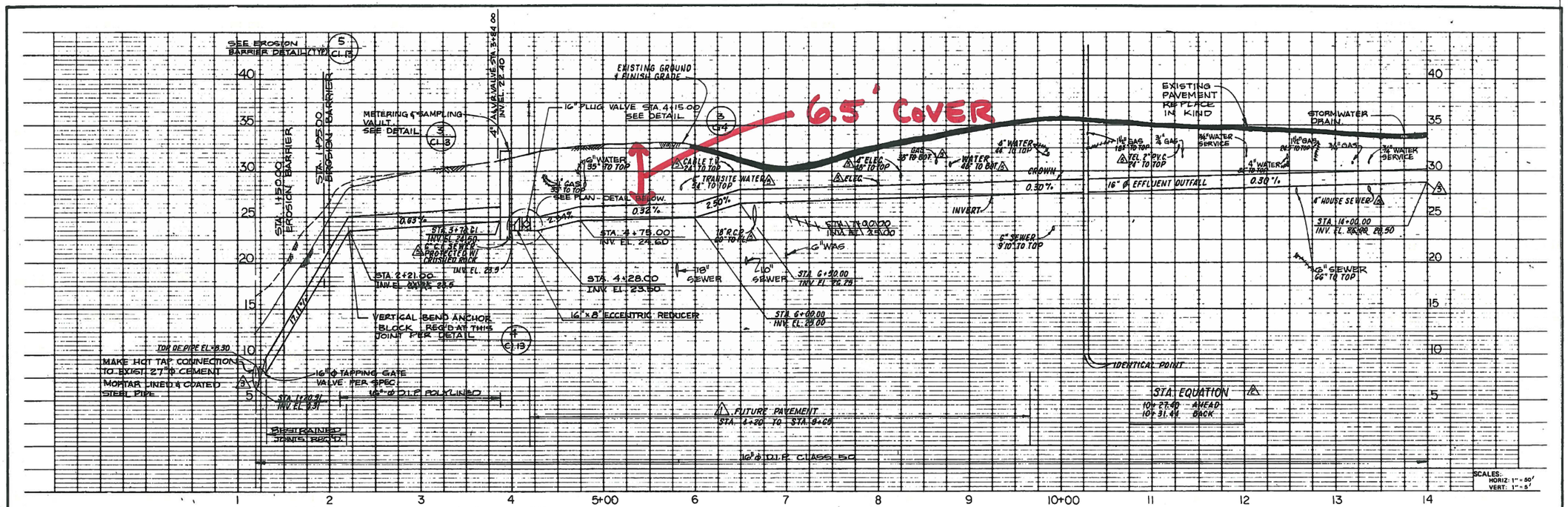

LEGEND

EXISTING

- UNIMPROVED ROAD
- P — POWER CABLES
- IMPROVED ROAD
- SMH SEWER MANHOLE
- WMH WATER MANHOLE
- MH MANHOLE
- TS TRAFFIC SIGNAL
- EB ELECTRIC BOX
- CONC CONCRETE
- HW HEADWALL
- WV WATER VALVE
- GV GAS VALVE
- FL FLOWLINE
- PP POWER POLE
- DI DRAINAGE INLET
- HH HAND HOLE
- WM WATER METER
- GM GAS METER
- EM ELECTRIC METER
- TMH TELEPHONE MANHOLE
- TV TELEPHONE VAULT
- R\W RIGHT OF WAY
- U\C UNDER CONSTRUCTION
- WBO WATER BLOW OFF
- —E— ELECTRIC LINE
- —W— WATER LINE
- —S— SANITARY SEWER & MANHOLE
- —G— GAS LINE
- —F— FUEL LINE
- —FM— FORCE MAIN
- —SD— STORM SEWER
- —T— TELEPHONE CABLE OR DUCT
- HYDRANT
- FENCE
- UTILITY POLE
- SIGN
- CULVERT

PROPOSED

- D.I.P. DUCTILE IRON PIPE
- A & V.R. AIR & VACUUM RELEASE
- BLOW-OFF
- AIR/VACUUM VALVE
- PLUG VALVE
- FLOW METER
- SOIL BORING
- REDUCER

Leland Magness	JOB 3039	1 REVISIONS PER ADD # 2
DATE 8-22-80 RCE 007673	DATE JUN 22 1982	2 REV. ALIGN. 1+36.72 TO 2+50.00 & 3+78.61 TO 14+00.00 G-23-83
	DRAWN PLK	3 REV. GRADE 1+20.51 TO 14+00.00 G-23-83
	CHKD. GWM	4 REL. A & VRV TO RT SIDE 1-28-83
		5 ADD FD UTILITIES G-23-83

FALLBROOK SANITARY DISTRICT
EFFLUENT OUTFALL STA. 1+20.51 TO 14+00.00

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SHEET C1.01

S-2075

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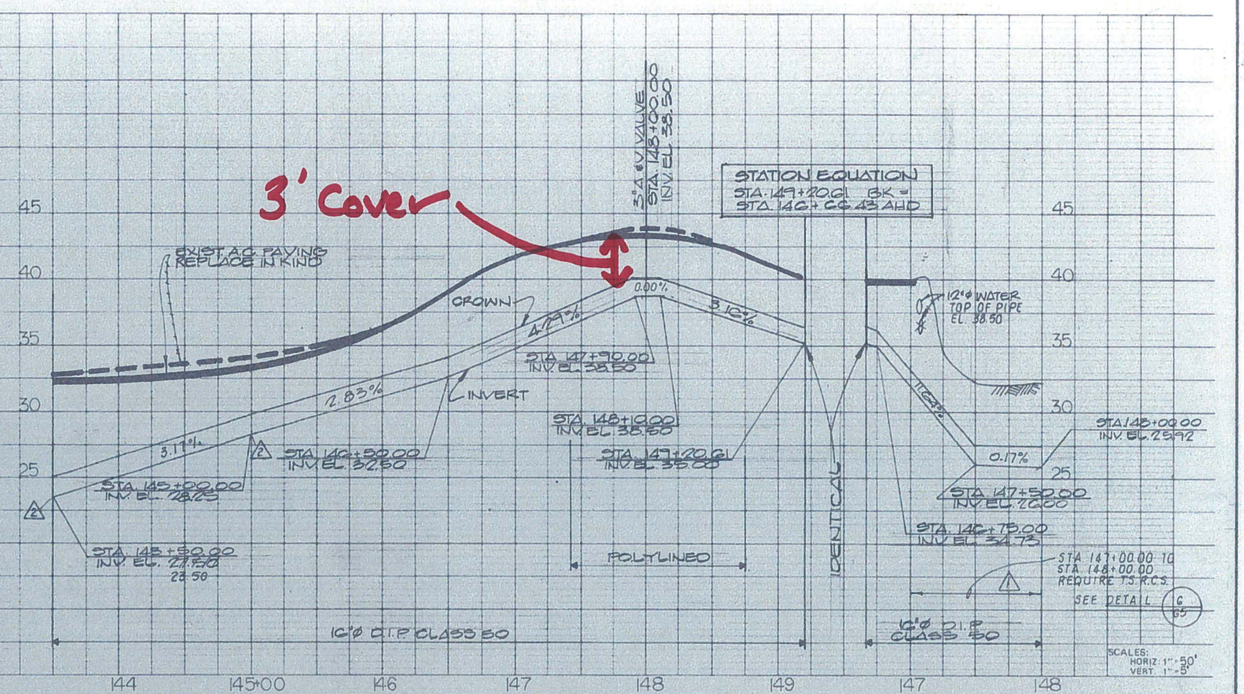
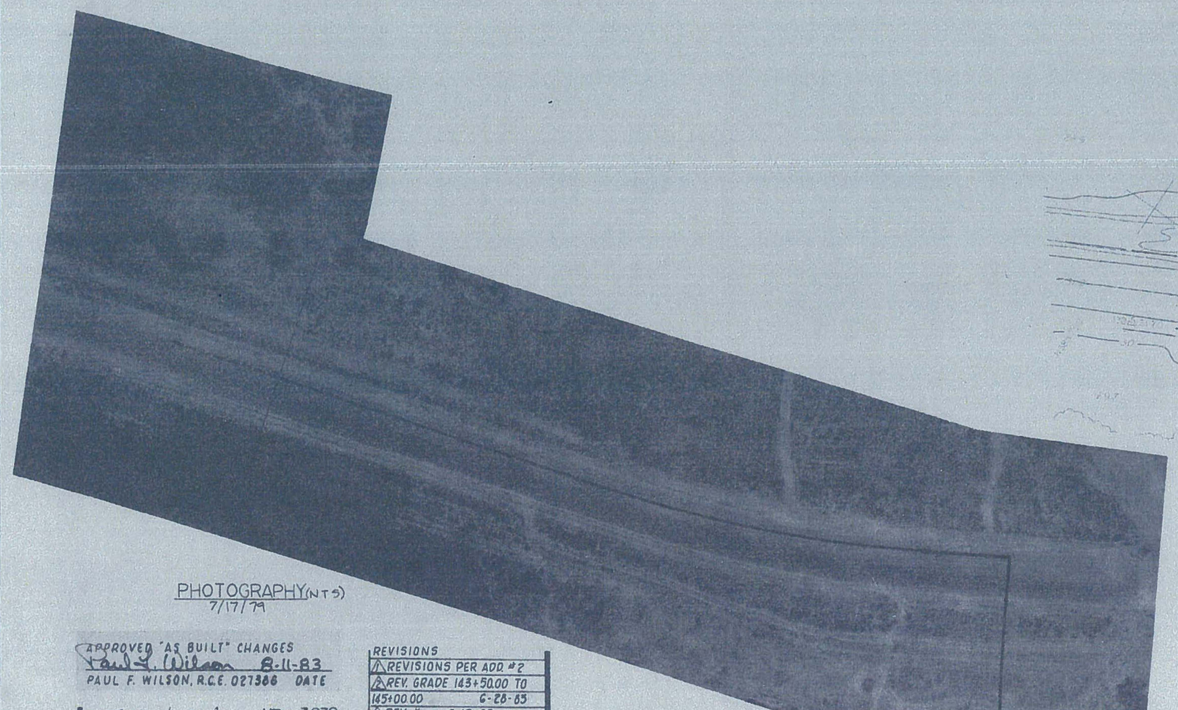
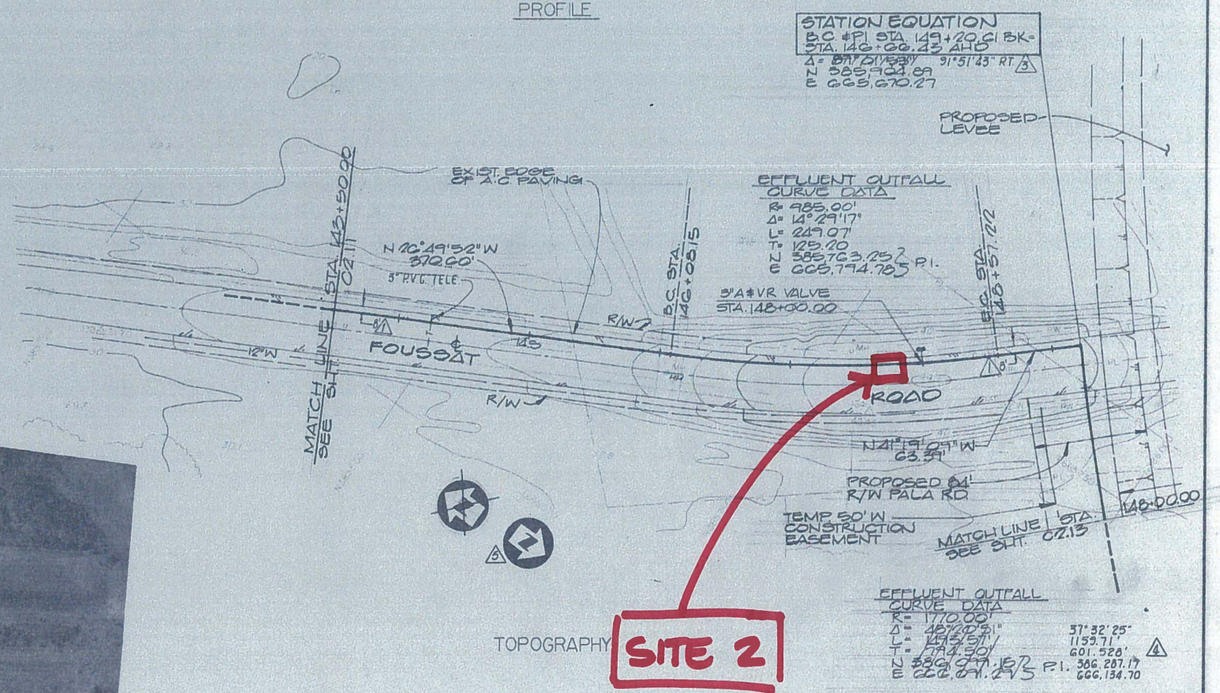
S Pacific St
Tait St
S Myers St
Wilmerby St
EXIST
16"
FALLBROOK
SITE 1
5' x 6'
PIT



PROFILE



PHOTOGRAPHY (NTS)
7/17/79



APPROVED "AS BUILT" CHANGES	REVISIONS
Paul F. Wilson 8-11-83	⚠ REVISIONS PER ADD #2
PAUL F. WILSON, R.C.E. 027366 DATE	⚠ REV. GRADE 143+50.00 TO 145+00.00 6-28-83
	⚠ REV. ⚠ 8-17-82
	⚠ REV. CURVE DATA 8-17-82
	⚠ REV. NORTH ARROW 8-17-82

DATE 7-15-81	JOB 3039	
DESIGNED GE 21136	DATE SEPT 1 1981	
	DRAWN SB	
	CHKD. GWM	

FALLBROOK SANITARY DISTRICT
EFFLUENT OUTFALL STA. 143+50.00 TO 148+00.00

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SHEET C2.12

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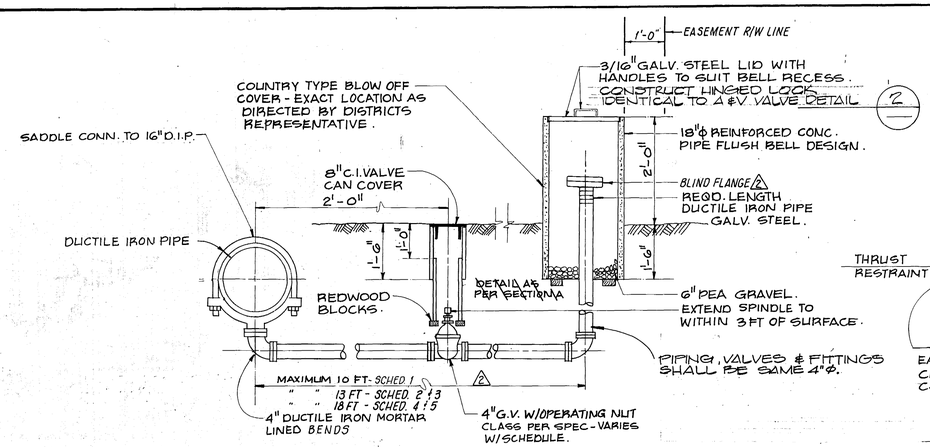
S-2102


SITE 2
5'x6'
PIT
EXIST
16"
FALLBROOK
Oceanside Swap
Meet Market
Oceanside Swap Meet
Chroma Auto Detailing
Only A Trip Away
Benet Rd
Blue Jay Dr
Soyla Dr
Toopal Dr
San Luis Rey River Trail
Alex Rd
Foussat Rd
San Luis Rey Mission Expy
Hwy 76
Women's Resource
Center Thrift
Mission Rd
Pioneer Dr
Irina's Bar and Grill
Google



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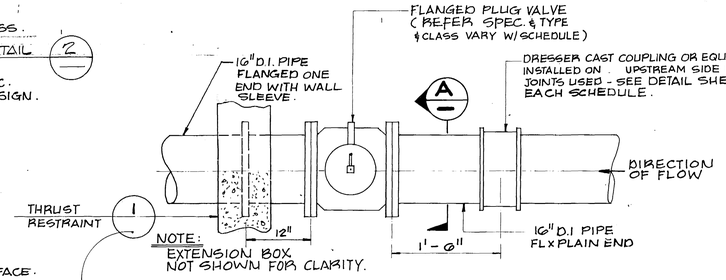
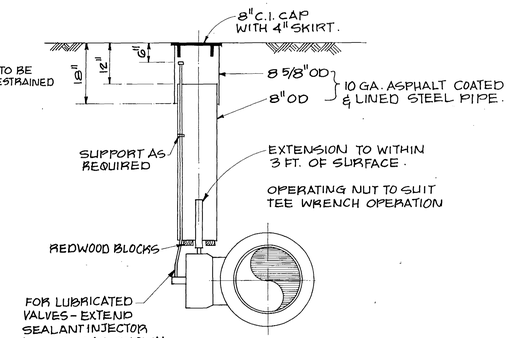


PLAN VIEW ISOLATION VALVE INSTALLATION 3



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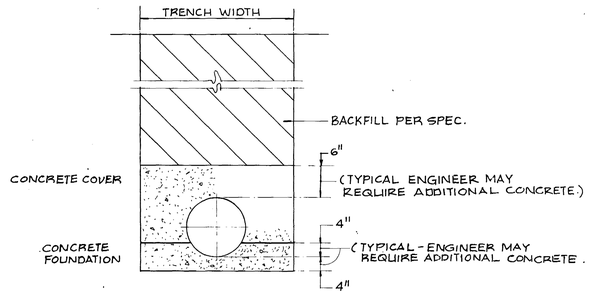
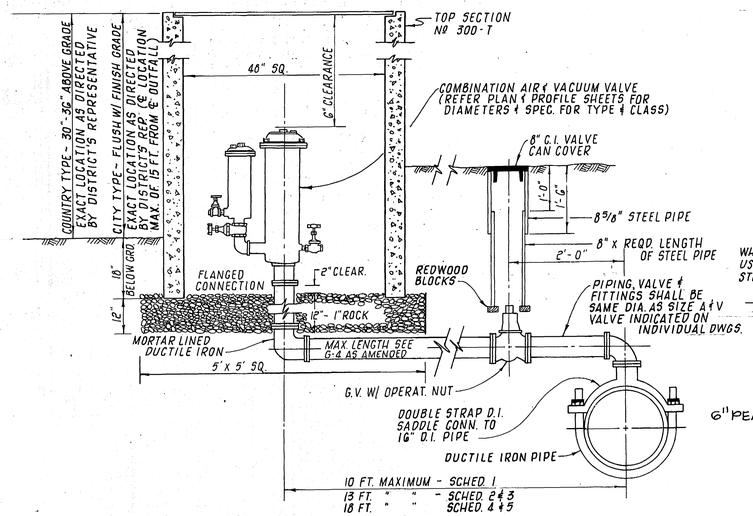
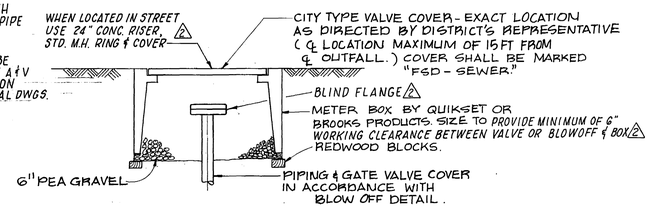


CLASS B CONCRETE TO BE USED.

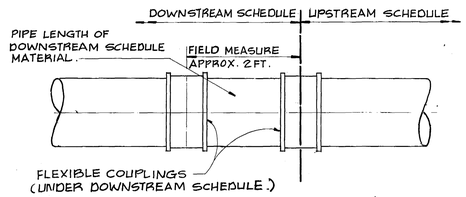




CITY TYPE BLOWOFF COVER
NO SCALE

2 AIR & VACUUM VALVE DETAIL
NO SCALE

NOTE: REINFORCED CONC. RIPE SURROUNDS (COUNTRY TYPE) TO BE USED FOR BLOWOFFS & AIR & VACUUM ASSEMBLIES UNLESS CITY TYPE SPECIFICALLY CALLED OUT ON DRAWINGS.



SCHEDULE JUNCTION DETAIL 5
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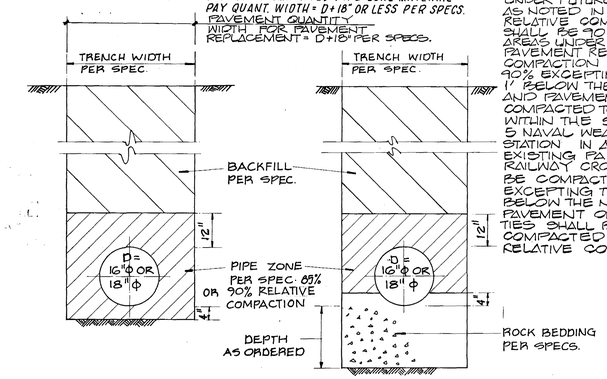
CONCRETE ENCASEMENT
(TO BE USED AT DIRECTION OF ENGINEER.)



NOTES: BACKFILL ABOVE THE PIPE ZONE SHALL BE COMPACTED TO 85% RELATIVE COMPACTION EXCEPT THAT: IN AREAS UNDER FUTURE PAVEMENTS, AS NOTED IN THE PROFILES RELATIVE COMPACTION SHALL BE 90%; AND IN AREAS UNDER EXISTING PAVEMENT RELATIVE COMPACTION SHALL BE 90% EXCEPTING THE TOP 1' BELOW THE NEW BASE AND PAVEMENT SHALL BE COMPACTED TO 95%; AND WITHIN THE SCHEDULE 5 NAVAL WEAPONS STATION IN AREAS UNDER EXISTING PAVEMENT & RAILWAY CROSSING SHALL BE COMPACTED TO 90%, EXCEPTING THE TOP 3' BELOW THE NEW BASE & PAVEMENT OR RAILROAD TIES SHALL BE COMPACTED TO 98% RELATIVE COMPACTION.

STANDARD BEDDING
NO SCALE

SPECIAL BEDDING
(TO BE USED AT DIRECTION OF ENGINEER.)

BEDDING REQUIREMENTS 4
NO SCALE

APPROVED "AS BUILT" CHANGES
Paul F. Wilson 8-11-83
PAUL F. WILSON, R.C.E. 027586 DATE

DATE 8-22-80	C.E. 007673	JOB 3039	REVISIONS
		DATE APR. 7, 1980	1 REV. A & V.V. DETAIL AND
		DRAWN DTC	REMOVE CITY TYPE A. & V.V.
		CHKD. RJT	COVER G-21-83
			2 REVISIONS PER ADD. #2 & #3

FALLBROOK SANITARY DISTRICT
GENERAL DETAILS.

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SHEET G4

S-2073

S-2073

Appendix B. Technical Memorandum –Existing Fallbrook Outfall Design Criteria

TETRA TECH

DRAFT

Memorandum

Date:	March 18, 2016		
To:	Amy Czajkowski		
Cc:	Shawnele Morelos		
From:	Mark Bush, P.E.		
Project:	La Salina Lift Station and Plant Decommissioning	***Project Number:***	135-09369-15003
Subject:	Existing Fallbrook Outfall Design Criteria		

Introduction

The existing 16-inch Fallbrook Outfall currently conveys secondary treated effluent from the Fallbrook Public Utility District (FPUD) Treatment Plant No. 1 to the City of Oceanside's Ocean Outfall. As part of the La Salina Lift Station and Plant Decommissioning Project, the City of Oceanside would like to repurpose the existing Fallbrook Outfall pipeline to convey raw sewage up to the San Luis Rey Water Reclamation Facility (SLRWRF). Raw sewage would be pumped through the existing Fallbrook Outfall for a distance of approximately six (6) miles from the new lift station to Pala Road. At Pala Road, the raw sewage would be transferred from the existing Fallbrook Outfall into the existing 24-inch Mission Avenue Lift Station Force Main for a distance of approximately two (2) miles to the SLRWRF. The existing effluent from the Fallbrook Outfall would be transferred into the existing 24-inch Land Outfall near Pala Road for conveyance to the Ocean Outfall. The purpose of this memorandum is to discuss the current condition of the existing Fallbrook Outfall and to define the criteria needed in order to repurpose the Fallbrook Outfall.

The attached Figure 1 is a site plan showing the existing 16-inch Fallbrook Outfall, the existing 24-inch Land Outfall, and the existing 24-inch Mission Avenue Lift Station Force Main from the La Salina Wastewater Treatment Plant (LSWWTP) to the SLRWRF.

Current Pipeline Condition

The record drawings for the Fallbrook Outfall indicate that the existing 16-inch pipeline was constructed in the early 1980's. The pipeline material is Class 50 ductile iron pipe. Based on information obtained from current manufacture's catalogs, this represents a pipe wall thickness of 0.34-inches and a pressure class of 350 psi. Per the record drawings, the pipeline is poly lined at highpoints. There is no indication from the plans on the lining system beyond these limits, but the assumption would be cement mortar lining. It is industry standard to limit velocities within cement mortar lined pipe to less than 10 feet per second (fps) to avoid damage to the lining system.

The mainline isolation valves are plug valves, which are suitable for use in a sewage application, however the pressure class of the valves is unknown.

Additional appurtenances on the pipeline include air and vacuum valves, blow off valves and water meter connections for Caltrans irrigation areas. The model and type of air and vacuum valves and blow off valves are not specified on the record drawings, therefore the pressure class of the appurtenances is not known. FPUD has stated

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that they operate the existing pipeline at 150 psi, so in the absence of as-built information, we can assume that the pipeline appurtenances can be operated safely at 150 psi.

There are currently three (3) known irrigation connections for the Caltrans irrigation areas. There is a 2-inch water meter and a 4-inch water meter located near the intersection of Highway 76 and Airport Road. The third connection is an irrigation vault that branches off to a 4-inch and an 8-inch irrigation line located near the intersection of Highway 76 and the I-5 Freeway. These appurtenances will need to be abandoned and replaced if the existing Fallbrook Outfall is repurposed.

Fallbrook Outfall Design Criteria

The recommended design criteria for the force main pipeline is listed below:

- Pressure within the existing pipeline shall not exceed 150 psi
- Flow velocity shall not be less than 2 fps to keep grit moving, preferably diurnal flows shall provide 3 fps in order to re-suspend grit
- Flow velocities shall not exceed 10 fps, preferably limiting flow velocities to about 5 fps in order to limit the headloss developed due to friction which results in reduced pumping costs
- Provide appurtenances that are appropriate for use in a raw sewage application

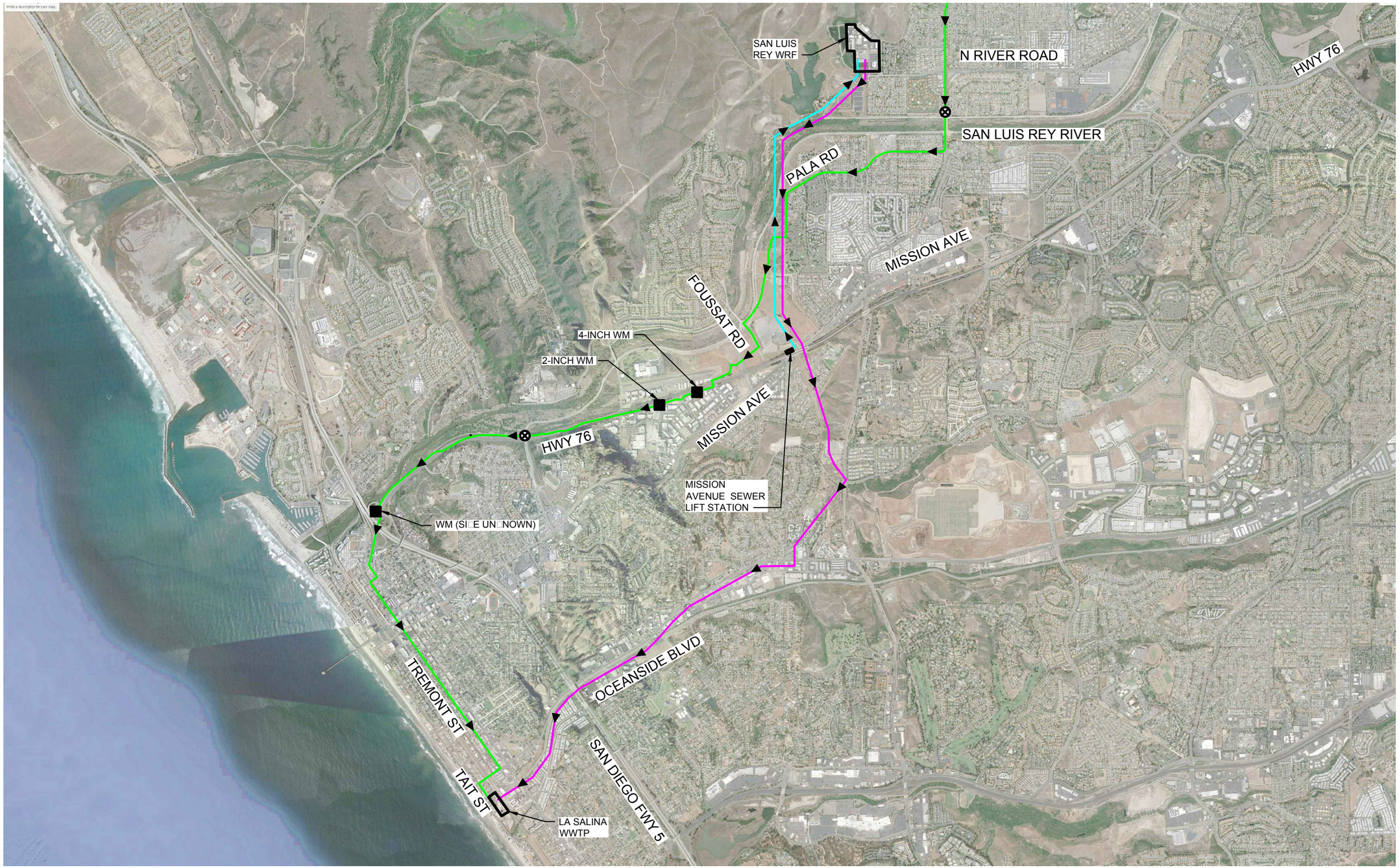
The following items shall be confirmed/designed prior to repurposing the existing Fallbrook Outfall:

- Pressure test the pipeline to confirm pipeline and appurtenance performance
- Perform visual inspection of the pipeline during the pressure tests
- Confirm the unknown Caltrans water meter sizes
- Provide a new source for the Caltrans irrigation areas
- Abandon existing water meter connections
- Confirm the existing air and vacuum valves and blow off valves are suitable for use in a raw sewage application
- Confirm the Mission Avenue Lift Station Force Main can handle additional flow
- Confirm the Land Outfall can handle the secondary effluent being transferred from the Fallbrook Outfall
- Provide a new alignment in the public right-of-way for the portion of the pipeline that currently traverses through the LSWWTP (this will avoid a pipeline in the land being sold to developers)

Please do not hesitate to contact me at 949-809-5157 should you have any questions.

MWB/mag

Attachments



WATER METER

WATER VALVE

EXISTING FALLBROOK LINE

EXISTING MISSION AVENUE LIFT STATION 24" FORCE MAIN

EXISTING 24" LAND OUTFALL

N

0 1600' 3200'

SCALE: 1" = 3200'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

16" FALLBROOK OUTFALL SITE PLAN

Project No.: 135-09369-15003

Date: MARCH 2016

Designed By: MBJ

Figure 1

Bar Measures 1 inch

Copyright: Tetra Tech

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Appendix C. Technical Memorandum – Evaluation of La Salina Lift Station Operating Alternatives

TETRA TECH

DRAFT

Memorandum

Date:	May 12, 2016		
To:	Amy Czajkowski, City of Oceanside		
Cc:	Shawnele Morelos, City of Oceanside		
From:	Mark Bush, P.E.		
Project:	La Salina Lift Station and Plant Decommissioning	***Project Number:***	135-09369-15003
Subject:	Evaluation of La Salina Lift Station Operating Alternatives		

Introduction

The La Salina Wastewater Treatment Plant (Treatment Plant) was originally constructed in 1948 and has been expanded and rehabilitated over the years. Since significant repairs to the Treatment Plant are necessary, the City of Oceanside (City) performed an evaluation of potential alternatives and in November 2014, the City Council approved the recommendation to decommission the aging La Salina Wastewater Treatment Plant. This project consists of demolishing the Treatment Plant and replacing it with a raw wastewater pump station to convey wastewater from the Treatment Plant collection area to San Luis Rey Water Reclamation Facility located over seven miles away.

The purpose of this memorandum is to discuss the various operating alternatives considered for the proposed La Salina Lift Station and to determine the operating conditions to be used in the design of the proposed lift station.

Flow Rates

Raw sewage enters the treatment plant from the influent manhole on the north-westerly side of the headworks building. The influent manhole collects sewage from the existing 33-inch gravity sewer on Tait Street as well as pumped flows from the South Pacific Lift Station. The City provided the following flow rates for the proposed La Salina Lift Station:

- Average Flow: 5.5 MGD (3,820 gpm)
- Peak Flow: 10.2 MGD (7,083 gpm)

The City also provided flow data from a flow meter located near the front of the treatment plant in-between the influent pump station and the load equalization tank. The influent pumps are controlled by the wet well level so they cycle on and off. The City provided flow meter data from four different dates. The recorded flow meter readings are shown on the attached Figures 1-4. For each date, the flow rate was taken at 5-minute increments over a period of 24-hours. The flow meter data is summarized in Table 1 on the following page:

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Table 1: Existing La Salina Flow Meter Data				
Date	**Average Flow (gpm)**	**Average Flow (MGD)**	**Peak Flow (gpm)**	**Peak Flow (MGD)**
July 6, 2015 (Figure 1)	2110	3.1	3952	5.7
December 6, 2015 (Figure 2)	2010	2.9	3945	5.7
January 6, 2016[1] (Figure 3)	2313	3.3	6705	9.7
January 9, 2016 (Figure 4)	2009	2.9	3970	5.7

Notes:
1. Periods of heavy rainfall occurred on this date.

As noted in the table above, the date of January 6, 2016 saw periods of heavy rainfall, therefore it is not indicative of typical treatment plant operations. However, it does show that the pumps discharged a flow rate close to the provided flow rate of 10.2 MGD. The average and peak flow rates from the flow meter readings are listed below:

- Flow Meter Average Flow: 3.1 MGD (2,153 gpm)
- Flow Meter Peak Flow: 9.7 MGD (6,705 gpm)

Design Criteria

The following design criteria shall be used:

- Pressure within the force main shall not exceed 150 psi (as indicated in the Existing Fallbrook Outfall Design Criteria Memo dated March 18, 2016)
- Flow velocity shall not be less than 2 feet per second (fps) to keep grit moving and preferably 3 fps in order to re-suspend grit that may have settled during non-operation
- Flow velocities shall not exceed 10 fps, preferably limiting flow velocities to about 5 fps in order to limit the headloss developed due to friction which results in reduced pumping costs
- Provide two hours of on-site emergency storage

The City would like to repurpose the existing 16-inch Fallbrook Outfall to convey raw sewage from the Treatment Plant collection area to the San Luis Rey Water Reclamation Facility. Therefore, the velocities for pipes ranging in size from 16-inches in diameter to 30-inches in diameter were evaluated and are summarized below:

Table 2: Summary of Pipe Sizes and Velocities		
Pipe Diameter (inches)	**Velocity at Average Flow of 5.5 MGD (fps)**	**Velocity at Peak Flow of 10.2 MGD (fps)**
16	6.1	11.3
18	4.8	8.9
20	3.9	7.2
24	2.7	5.0
30	1.7	3.2

The table shows that the velocity in a 16-inch diameter pipeline exceeds the design criteria at peak flow and that a 24-inch diameter pipeline would be optimal to meet the velocity design criteria at both the average and peak flows. In order to reuse the existing 16-inch diameter infrastructure, a lower flow rate that would reduce the velocity should be evaluated.

Operating Alternatives

Based on the findings above, Tetra Tech reviewed the following four alternatives for this project:

1. Pump peak flow of 10.2 MGD using the existing 16-inch Fallbrook Outfall pipeline
2. Pump average flow of 5.5 MGD using the existing 16-inch Fallbrook Outfall pipeline
3. Pump flow of 3.5 MGD using the existing 16-inch Fallbrook Outfall pipeline
4. Pump peak flow of 10.2 MGD using a new 24-inch force main

The hydraulics for each alternative were evaluated and the results are summarized in the table below:

Table 3: Summary of Operating Alternatives

Alt	Description	Flow Rate (MGD)	Flow Rate (gpm)	Load Equalization Tank Volume (gal)	Max TDH (ft)	hp[(1)]	Pressure[(2)] (psi)	Velocity (ft/sec)
1	Reuse 16" Fallbrook Outfall (Sized for Peak Flow)	10.2	7,083	N/A	1195	3,053	517	11.31
2	Reuse 16" Fallbrook Outfall (Sized for Avg Flow)	5.5	3,820	75,000	455	627	197	6.1
3	Reuse 16" Fallbrook Outfall (Sized for 3.5 MGD)	3.5	2,430	600,000	260	228	113	3.88
	Reuse 16" Fallbrook Outfall (Max flow at 150 psi)	4.3	2,986	325,000	330	355	143	4.77
4	Construct New 24" Force Main (Peak Flow)	10.2	7,083	N/A	279	713	120	5.03
	Construct New 24" Force Main (Avg Flow)	5.5	3,820	N/A	163	225	71	2.71

Notes:

1. Assumes an efficiency of 70%.
2. This is the maximum pressure taken in the pipeline and is located at the proposed La Salina Lift Station.

Alternative 1 - Pump Peak Flow of 10.2 MGD using the Existing 16-inch Fallbrook Outfall

As shown in the table above, if the system pumps a flow rate of 10.2 MGD, the internal pressure of the force main would be over 500 psi, which exceeds the 350 psi pressure rating of the Fallbrook Outfall pipeline. This is not a feasible alternative and no further evaluation will be conducted unless directed by the City.

Alternative 2 - Pump Average Flow of 5.5 MGD using the Existing 16-inch Fallbrook Outfall

This alternative would produce an internal pressure of roughly 200 psi in the pipeline and would require additional on-site storage to attenuate the peak flows. This alternative exceeds the maximum design criteria of 150 psi and no further evaluation will be conducted unless directed by the City.

Alternative 3 - Pump Flow of 3.5 MGD using the Existing 16-inch Fallbrook Outfall

Alternative 3 consists of pumping a flow rate of 3.5 MGD to achieve a pipeline pressure of about 113 psi. This flow rate more closely aligns with the average daily flows currently being pumped at the treatment plant and provides a more conservative option since the system pressure would be less than the design criteria of 150 psi. The velocity also meets the minimum criteria of 2-3 fps and the maximum criteria of 5 fps. The City could also potentially pump up to 4.3 MGD during rain/emergency events and still keep the pressure in the existing Fallbrook Outfall under the design criteria of 150 psi. This alternative would require on-site storage of roughly 600,000 gallons to attenuate peak flows in addition to the required two hours of emergency storage

Alternative 4 - Pump Peak Flow of 10.2 MGD using a New 24-inch Force Main

This alternative would consist of constructing approximately eight miles of a 24-inch force main from the Treatment Plant collection area to the San Luis Rey Water Reclamation Facility. No alignment analysis has been conducted, but for hydraulic purposes, the same Fallbrook Outfall pipeline alignment was used. The internal pressure of the new force main would be 120 psi at a peak flow of 10.2 MGD and would meet the minimum velocity requirements at an average flow of 5.5 MGD. This alternative would provide new infrastructure and would meet all the design criteria, however it would come at a cost of roughly $9-$10 million. This additional cost was not included in the City's budget for this project and no further evaluation of this alternative will be conducted unless directed by the City.

Emergency Storage Basin

The City desires two hours of on-site emergency storage to provide response time for operation staff should there be a failure at the lift station and pumping operations cease. A 500,000 gallon storage basin provides 2.2 hours of storage at an average flow of 5.5 MGD and meets the City's two hour storage criteria.

Load Equalization Tank

Some of the operating alternatives listed above require the use of a load equalization tank to attenuate peak flows. We reviewed reusing the existing load equalization tank which has volume of roughly 850,000 gallons. This option is not recommended due to the following factors:

- The existing load equalization tank elevation is higher than the proposed lift station, requiring peak flows to be pumped to the existing load equalization tank
- The proposed lift station would require two sets of pumps and force mains; one to pump to the San Luis Rey Water Reclamation Facility and one to pump to the load equalization tank
- The existing load equalization tank was built in the early 1990s and it is already 25 years old
- The condition of the existing tank is unknown
- It would be difficult to keep the existing treatment plant in operation if this tank were reused
- It would reduce the area sold to developers

A new load equalization tank that includes emergency storage is recommended for this project.

La Salina Lift Station Operating Condition

As a result of the analysis presented herein, the recommended operating condition for the proposed La Salina Lift Station is Alternative 3. The design flows for the proposed La Salina Lift Station are shown in Table 4 below:

Table 4: Recommended Design Flows

	Flow (MGD)	Flow (gpm)	Lift (ft)
Normal Operating Condition	3.5	2,430	228
Maximum Operating Condition (during rain/emergency events)	4.3	2,986	355

The normal operating condition would be to pump flows at 3.5 MGD in order to maintain force main pressures at around 113 psi. The pumps shall designed for the higher flow rate of 4.3 MGD in order to meet the maximum operating criteria. VFDs are recommended in order to operate the lift station under both conditions. It should be noted that if the La Salina Lift Station is operated using VFDs, then the Mission Avenue Lift Station, which is equipped with VFDs, would need to operate at a constant speed to avoid constant cycling between the two lift stations. The La Salina system curve can be seen in the attached Figure 5. The recommended design flow and system curve will be used to develop pump speed curves and select a pump in final design.

The load equalization tank shall be designed for the lower flow rate of 3.5 MGD in order to provide adequate storage. At a flow rate of 3.5 MGD, the load equalization tank would need to be sized at 600,000 gallons. This volume in combination with the 500,000 gallons of emergency storage would result in a total on-site storage volume of 1.1 million gallons. A more detailed review of the load equalization tank will be provided in final design.

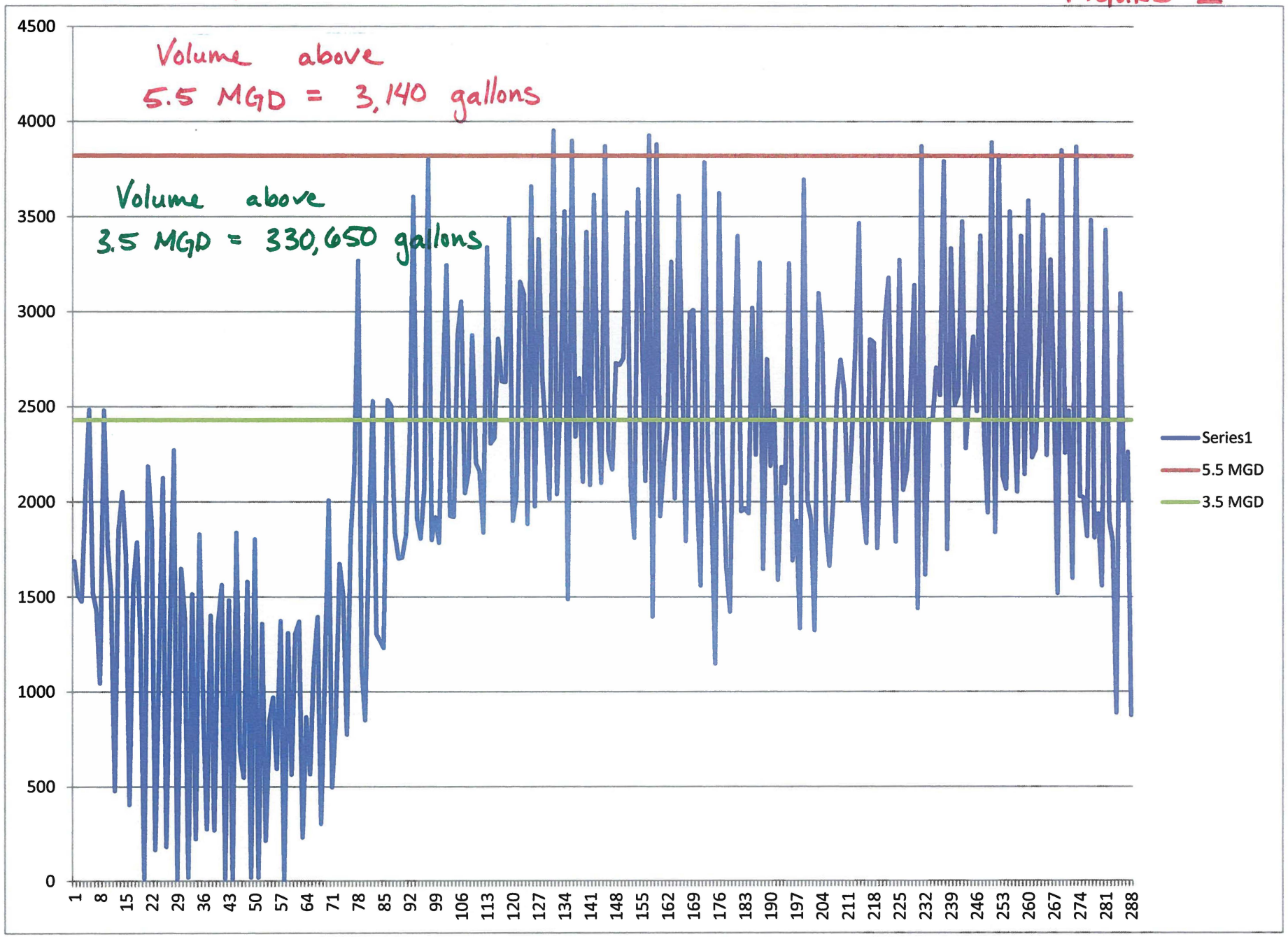
Please do not hesitate to contact me at 949-809-5157 should you have any questions or require additional information.

MWB/cg

Attachments

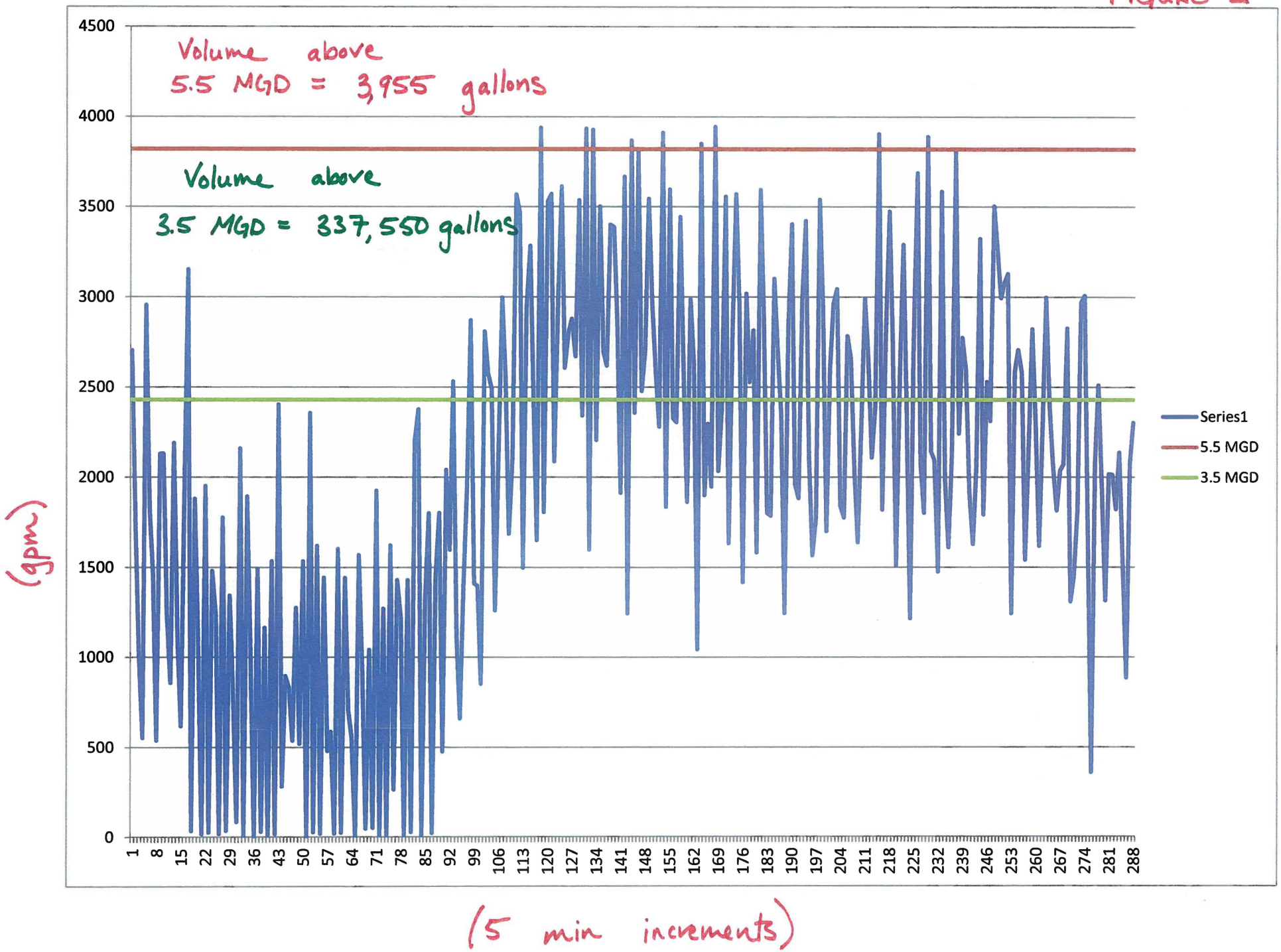
Date: 7/6/2015

FIGURE 1



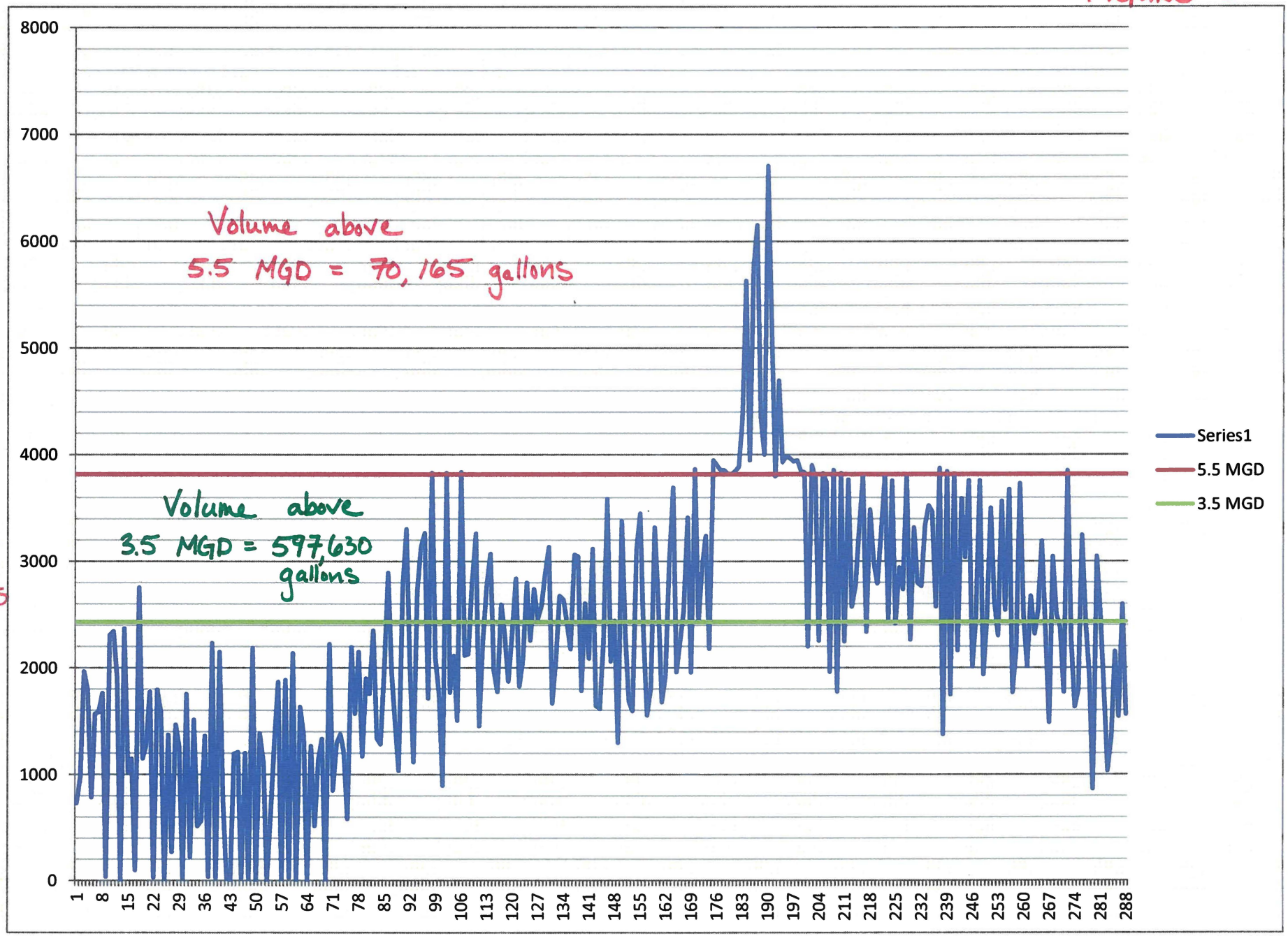
Date: 12/6/2015

FIGURE 2.



Date : 1/6/2016 (Rain Event)

FIGURE 3



Date : 1/9/2016

FIGURE 4

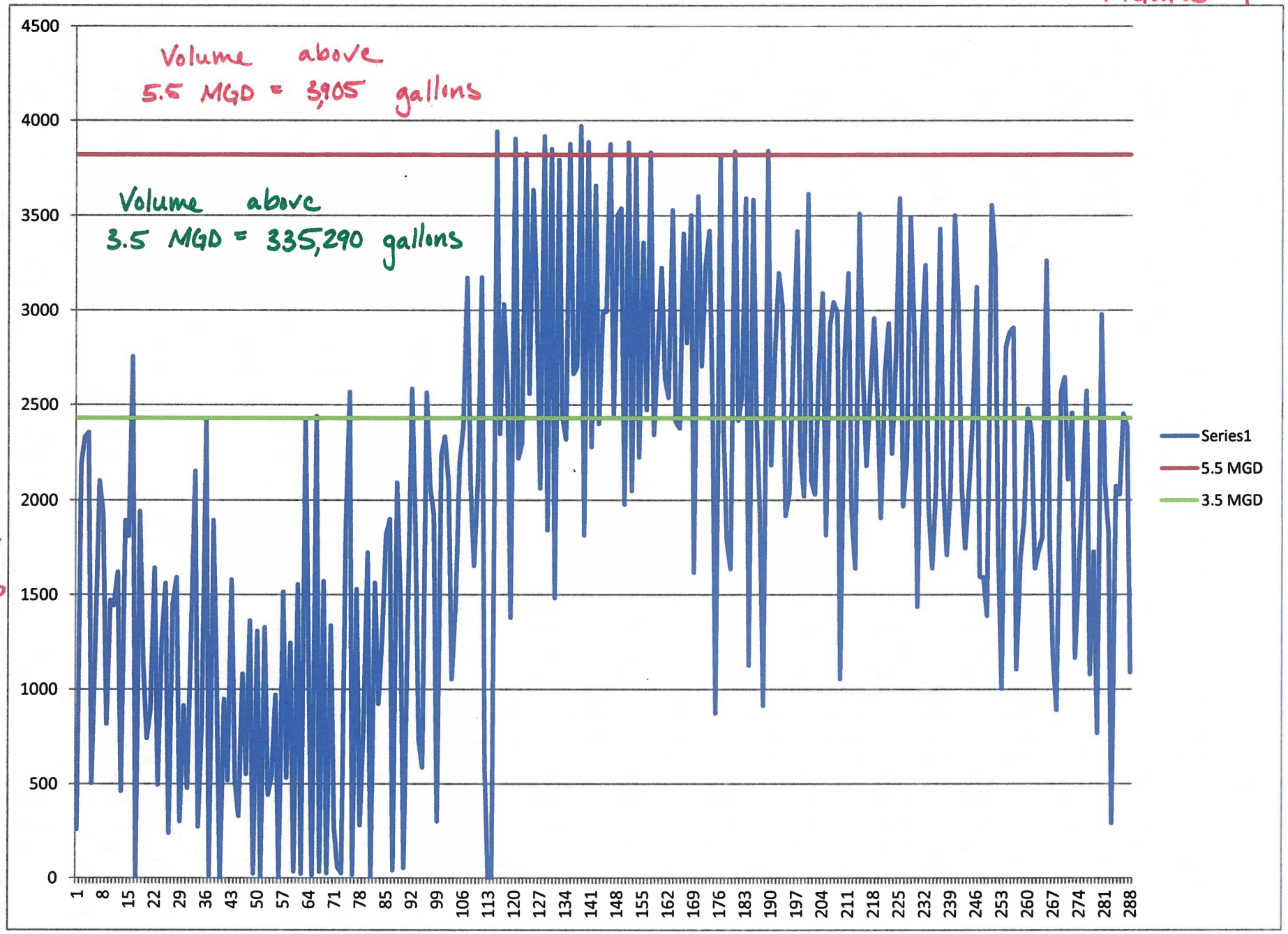
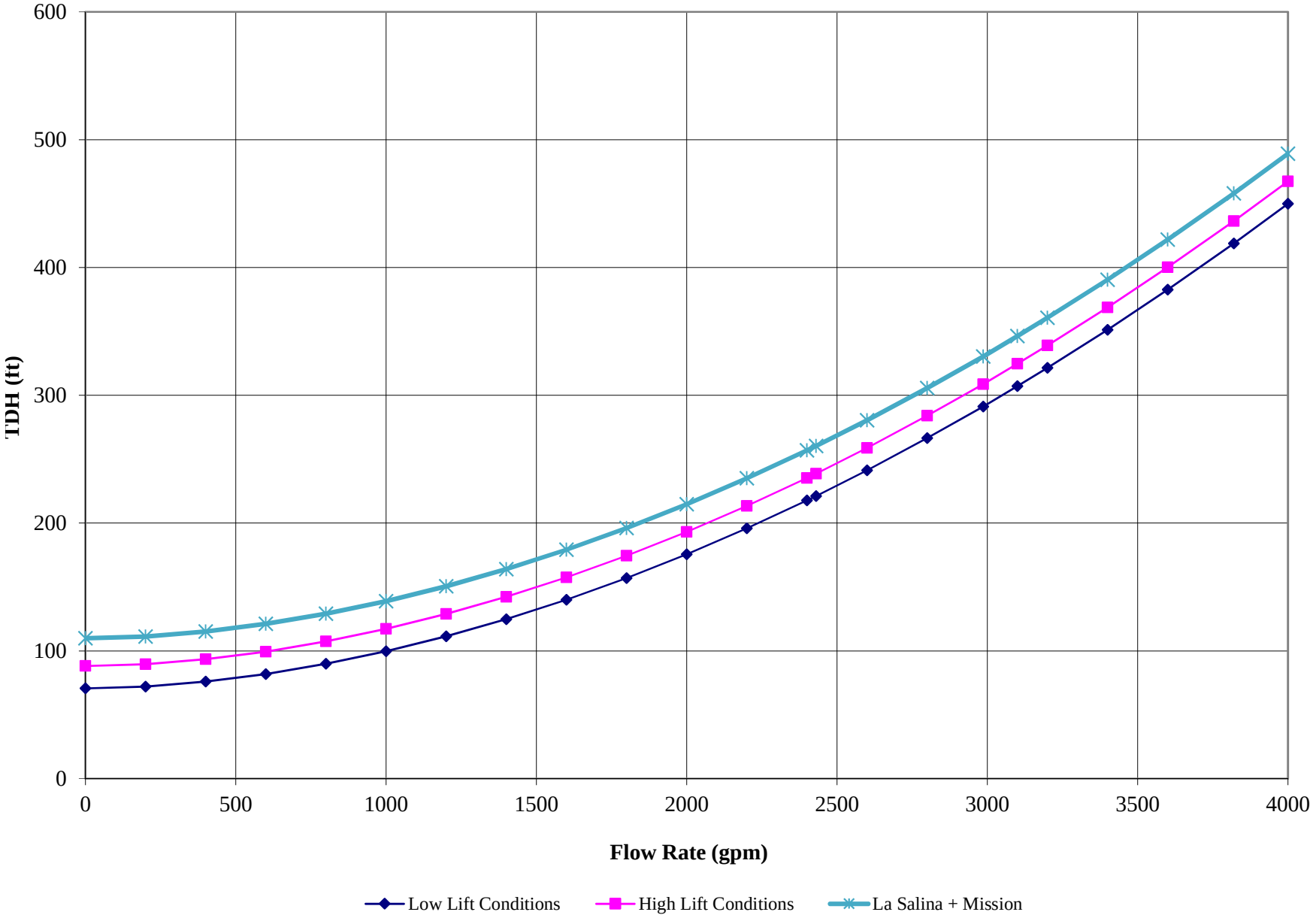


FIGURE 5
Proposed La Salina Lift Station
System Curve



Appendix D. Technical Memorandum - Evaluation of Proposed El Corazon Lift Station and Existing Buena Vista Lift Station

TETRA TECH

DRAFT

Memorandum

Date:	January 9, 2017
To:	Shawnele Morelos, P.E., City of Oceanside
Cc:	Greg Keppler, P.E., City of Oceanside
From:	Mark Bush, P.E. and Steve Ellis, P.E., Tetra Tech
Project:	La Salina Lift Station and Plant Decommissioning
Project Number:	135-09369-15003
Subject:	Evaluation of Proposed El Corazon Lift Station and Existing Buena Vista Lift Station

Introduction

As part of the La Salina Lift Station and Plant Decommissioning Project, the City of Oceanside (City) will need to convey raw sewage from the La Salina Wastewater Treatment Plant collection area to the San Luis Rey Water Reclamation Facility (SLRWRF) located over seven miles away. The current project concept is to pump flows through a new force main from the La Salina Lift Station to the Mission Lift Station force pipe for conveyance to the SLRWRF. The City has reviewed their existing sewer system and has identified another possible alternative. The City has asked Tetra Tech to review the feasibility of this alternative project concept.

The El Corazon Specific Plan calls for the construction of a lift station near the intersection of Oceanside Boulevard and El Camino Real to pump the sewage generated from the El Corazon development to the SLRWRF. However, a larger lift station could be constructed that would collect flows from the proposed La Salina Lift Station, the El Corazon development and other gravity sewers which flow towards the intersection of Oceanside Boulevard and El Camino Real. The new lift station would then pump into the existing Buena Vista Lift Station pipeline for a distance of approximately three and one-half miles to the SLRWRF. This alternative could potentially decrease the size of the La Salina Lift Station footprint by decreasing the size of the proposed Load Equalization Tank, decrease the amount of piping that would need to be built as part of the La Salina force main as well as allow the City to fix some of the deficiencies that they currently have in their gravity sewer system. However, the City would need to confirm that sufficient land exists at the El Corazon site to construct a larger lift station facility.

The purpose of this memorandum is to evaluate the feasibility of increasing the size of the proposed El Corazon Lift Station and adding this increased flow into the existing Buena Vista Lift Station pipeline up to SLRWRF for treatment. A more thorough engineering evaluation would need to be performed if this alternative is deemed to be suitable to the City's needs, which would include site layouts, pump sizing, storage requirements and other criteria.

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Proposed El Corazon Lift Station Flow Rates

The proposed El Corazon Lift Station would collect flows from three influent sources as summarized below:

Table 1: Proposed El Corazon Lift Station Flows

Influent Source	Average Flow (MGD)	Peak Flow (MGD)
Oceanside Blvd Gravity Flows	3.47	5.37
El Corazon Gravity Flows	0.25	0.44
La Salina Force Main Flows	5.5	10.2
Total Flows	**9.2**	**16.0**

Existing Buena Vista Lift Station Flow Rates

The existing Buena Vista Lift Station flow rates are summarized below:

Table 2: Existing Buena Vista Lift Station Flows

	Average Flow (MGD)	Peak Flow (MGD)
Buena Vista Lift Station	2.2	7.7

Summary of Combined Flow Rates in the Buena Vista Lift Station Pipeline

Under this new alternative, the final three and one-half miles of the existing Buena Vista Lift Station pipeline would see combined flows from the existing Buena Vista Lift Station and the proposed El Corazon Lift Station. These flows are summarized below:

Table 3: Summary of Combined Flow Rates in the Buena Vista Lift Station Pipeline

	Average Flow (MGD)	Peak Flow (MGD)
Proposed El Corazon Lift Station	9.2	16
Existing Buena Vista Lift Station	2.2	7.7
Total Flows	**11.4**	**23.7**

Impacts to Buena Vista Lift Station Pipeline

As shown on the attached Figure 1, the HGL of the existing Buena Vista Lift Station pipeline is set by the large hill on El Camino Real. The Buena Vista Lift Station pipeline functions as a force main up the large hill, then turns into a gravity main down the hill and acts like a siphon in the flatter portion between the hill and the SLRWRF. The addition of the maximum peak flow of 16 MGD (11,111 gpm) from the proposed El Corazon Lift Station near the intersection of Oceanside Boulevard and El Camino Real will increase the friction loss in the final three and one-half miles of the Buena Vista pipeline. The increased head will not exceed the HGL set by the large hill, therefore the additional flow will not impact the existing Buena Vista pumps.

The record drawings for the existing 42-inch Buena Vista pipeline indicate that the existing 42-inch pipeline was constructed in the late 1980s. The pipeline material is Class 50 ductile iron pipe. Based on information obtained from current manufacture's catalogs, this represents a pipe wall thickness of 0.47-inches and a pressure class of 200 psi.

The table below summarizes the impacts of the additional flow into the Buena Vista pipeline. The table displays a variety of flow rates from 11.4 MGD (total combined average flows) to 23.7 MGD (total combined peak flows):

Table 4: Summary of Impacts of Additional Flow into Buena Vista Pipeline

Total Flow Rate[1] (MGD)	Total Flow Rate[1] (gpm)	Velocity in 30" Pipe (ft/sec)	Velocity in 42" Pipe (ft/sec)	Additional Head Differential[2] (ft)	Available Head Differential (ft)	Does Additional Flow Exceed the Available Head?	Does Additional Flow Meet Pipeline Pressure Class?
11.4	7,920	3.6	1.8	5	159	No	Yes
13.4	9,305	4.2	2.2	8	159	No	Yes
15.4	10,695	4.9	2.5	12	159	No	Yes
17.4	12,085	5.5	2.8	16	159	No	Yes
19.4	13,475	6.1	3.1	21	159	No	Yes
21.4	14,860	6.8	3.4	26	159	No	Yes
23.7	16,460	7.5	3.8	32	159	No	Yes

Notes:

1. The total flow rate in the pipeline represents the combined flows from the proposed El Corazon Lift Station and the existing Buena Vista Lift Station. The table displays a variety of flow rates from 11.4 MGD (total combined average flows) to 23.7 MGD (total combined peak flows).
2. The additional head differential is the additional friction loss caused by the additional flow from the proposed El Corazon Lift Station.

Summary

The additional flows from the proposed El Corazon Lift Station will not impact the existing pumps or operation of the existing Buena Vista Lift Station, therefore this alternative is feasible from a hydraulic standpoint. In addition, it shortens the length of the proposed La Salina force main. Previous evaluations of the proposed La Salina Lift Station showed that the lift station could only pump a portion of the peak flow (approximately 4.5 MGD) and that a load equalization tank would be required to attenuate peak flows. This alternative may allow the La Salina Lift Station to pump closer to the peak flow of 10.2 MGD and reduce the size of the load equalization tank or perhaps even move the load equalization tank to the proposed El Corazon Lift Station site. These options would require a more detailed evaluation if this alternative is selected.

Project Alternatives and Preliminary Opinion of Probable Construction Cost

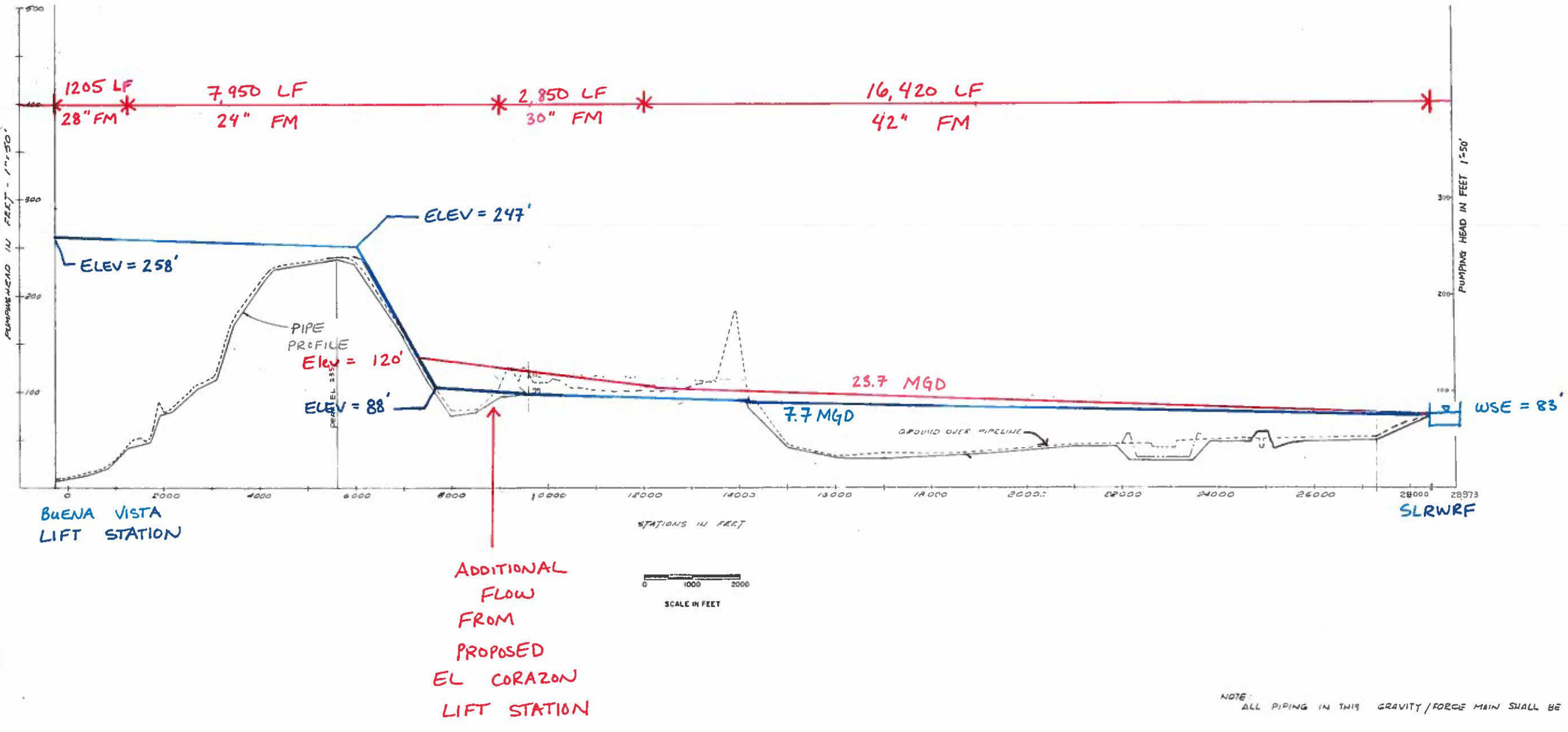
Exhibit A shows a summary of the La Salina Lift Station Project Alternatives. Project Alternative 1 is the original project alternative with flows being pumped from the La Salina Lift Station into the Mission Lift Station Force Main for conveyance to the SLRWRF. Project Alternative 2 is the revised concept project alternative with flows being pumped from the La Salina Lift Station to a larger El Corazon Lift Station for conveyance to the SLRWRF as evaluated and described above.

A summary of the preliminary opinion of probable construction costs for the new La Salina force main alternative (from the La Salina List Station to the El Corazon List Station) is shown in Exhibit B. The preliminary opinion of probable construction costs for the larger El Corazon Lift Station is shown in Exhibit C. These estimates are intended to be as comprehensive as possible at this preliminary design stage where much of the work is still at a conceptual level.

We look forward to discussing this project in further detail with the City. Please do not hesitate to contact me at 949-809-5157 should you have any questions or require additional information.

MWB/cg

Attachments



NOTE:
ALL PIPING IN THIS GRAVITY/FORCE MAIN SHALL BE CLASS 150

HGL for Buena Vista Lift Statin Only (7.7 MGD ≈ 5,350 gpm)

HGL for Combined Flow Rates (23.7 MGD ≈ 16,460 gpm)

FIGURE 1

AS BUILT 3-75

RALPH STONE AND COMPANY, INC.
478-1501
879-1115

CITY OF OCEANSIDE, CA.

APPROVED
ALTON L. RUDEN (R.E. Nº 10831) - CITY ENGINEER

FORCE MAIN
HYDRAULIC PROFILE
BV, ESLR to NSLR

4.0-C4

3-8-71

DRAWING NUMBER
S-664

DRAWING NUMBER

DRAWING NUMBER

DRAWING NUMBER
S-664

TETRA TECH

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Client: City of Oceanside
Project: La Salina Lift Station and Plant Decommissioning

Sheet No. 1 of 1
Job No. 135-09369-15003
Computed by: MBL
Checked by: MWB Date: 1/6/2017

EXHIBIT A
Summary of Project Alternatives

	Project Alternative 1 (See Note 1)		**Project Alternative 2 (See Note 2)**	
Description	Pump La Salina flows into the Mission FM to SLRWRF		Pump La Salina flows to El Corazon Lift Station. Pump flows a second time from El Corazon Lift Station to SLRWRF	
New La Salina Forcemain Length (feet)	24,300		19,000	
Peak Pumped Flows at La Salina (mgd)	5.5		5.5	
Peak Pumped Flows at La Salina (gpm)	3820		3820	
HGL at La Salina Lift Station (feet)	271		159	
Max TDH at La Salina (feet)	282		170	
Total hp at La Salina (See Note 3)	409 (2 pumps at 250 hp)		247 (2 pumps at 150 hp)	
Preliminary Costs (in millions of dollars) (See Note 4)	La Salina Lift Station	$14.8	La Salina Lift Station	$14.8
	New FM from La Salina to Mission FM down Mission Ave	$19.1	New FM from La Salina to El Corazon down Oceanside Blvd (See Note 5)	$19.8
	Impacts to Mission Lift Station (See Note 6)	**??**	Impacts to Buena Vista Lift Station	$0
	El Corazon Lift Station (See Note 7)	**??**	El Corazon Lift Station	$9.2
	La Salina WWTP Decommissioning	$15	La Salina WWTP Decommissioning	$15
	Total	***$48.9+***	***Total***	***$58.8***

Notes:
1. Project Alternative 1 will impact the operation of the existing Mission Lift Station as described below in Note 6.
2. For comparison purposes, the Project Alternative 2 is shown with the same max pumping flowrate as what is used in the Project Alternative 1. However, it is feasible from a hydraulic standpoint to increase the pumped flowrates for Project Alternative 2 without affecting the existing Buena Vista Lift Station.
3. Assumes 70% pump efficieny and 95% motor efficiency.
4. The preliminary costs are rough order of magnitude type costs.
5. New FM from La Salina to El Corazon was assumed as night work.
6. Impacts to Mission Lift Station include new pumps, new motors, and possible upgrades to the electrical components and generator. Cost impacts are unknown at this time.
7. Unknown at this time.

TETRA TECH

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Client: City of Oceanside
Project: La Salina Lift Station and Plant Decommissioning

Sheet No. 1 of 1
Job No. 135-09369-15003
Computed by: MBL
Checked by: MWB Date: 1/6/2017

EXHIBIT B
Preliminary - Order of Magnitude Probable Construction Costs
New Force Main from La Salina Lift Station to El Corazon Lift Station along Oceanside Blvd

Item No.	Estimated Qty	Unit	Description	Unit Price	Total Price
	1	LS	Mobilization and Demobilization	$750,000	$750,000
	1	LS	Sheeting, Shoring and Trench Protection	$300,000	$300,000
	17650	LF	Construct 24" Sewer Force Main	$500	$8,825,000
	350	LF	Construct 42" Steel Casing (Bore and Jack) with 24" Carrier Pipe at Railroad Crossing	$3,600	$1,260,000
	1000	LF	Construct 42" Steel Casing (Bore and Jack) with 24" Carrier Pipe at I-5 Freeway Crossing	$3,300	$3,300,000
	1	LS	Force Main Appurtenances (AV, BO, etc.)	$525,000	$525,000
	19000	LF	Testing of Sewer Force Main	$5	$95,000
	450000	SF	Grind and Cap Pavement	$2	$900,000
	1	LS	Traffic Control	$550,000	$550,000
			SUBTOTAL		**$16,505,000**
			CONTINGENCY (20%)		**$3,295,000**
			TOTAL		**$19,800,000**

This cost estimate is an estimate only. These figures are supplied as a guide only. This firm is not responsible for fluctuation in cost of material, labor, or components, or unforeseen contingencies.

Assumptions:

1. Imported backfill has been assumed.
2. Assumed City of Oceanside will require a grind and cap over a width of two lanes (half the street).
3. Mobilization and Demobilization has been assumed at 5% of the cost.
4. Sheeting, Shoring and Trench Protection has been assumed at 2% of the cost.
5. Force Main Appurtenances have been assumed at 4% of the pipeline cost.
6. Night work has been assumed for the construction of the pipeline.

EXHIBIT C
Preliminary - Order of Magnitude Probable Construction Costs
El Corazon Lift Station

Item	Quantity	Unit Cost	Cost ($)
Mobilization/Demobilization	1 LS	75,000 LS	75,000
Earthwork and Grading	5,000 CY	15 $/CY	75,000
Site Paving	32,000 SF	6 $/SF	192,000
Site Fencing (Assumes Chain Link Fence)	1,400 LF	15 $/LF	21,000
Misc Site Work - drainage, lighting, etc	1 LS	25,000 LS	25,000
Site Piping	1 LS	50,000 LS	50,000
Load Equalization and Emergency Storage Tanks/Wet Well	1 LS	2,000,000 EA	2,000,000
Sewage Pumps	4 EA	225,000 LS	900,000
In-line Grinders	4 EA	75,000 LS	300,000
Pump Station Building (Assumes CMU Building)	1,400 SF	450 $/SF	630,000
Odor Control Equipment	1 LS	350,000 LS	350,000
Painting and Coatings	1 LS	70,000 LS	70,000
Electrical MCCs, VFD, Transformer, Conduit and Wiring	1 LS	1,200,000 LS	1,200,000
Instrumentation and Controls	1 LS	100,000 LS	100,000
Emergency Standby Generator	1 EA	600,000 EA	600,000
Subtotal			6,588,000
Contingencies @ 20%			1,317,600
Subtotal			7,905,600
Bonds and Insurance @ 2%			158,000
Contractors Overhead and Profit @ 15%			1,185,840
Total Estimated Construction Costs			**9,249,440**

Includes flows from La Salina, Oceanside Blvd and El Corazon = 9.2 MGD avg

Appendix E. Technical Memorandum - Evaluation of Additional Force Main Project Concepts

TETRA TECH

DRAFT

Memorandum

Date:	June 13, 2017
To:	Shawnele Morelos, P.E., City of Oceanside
Cc:	Greg Keppler, P.E., City of Oceanside
From:	Mark Bush, P.E. and Steve Ellis, P.E., Tetra Tech
Project:	La Salina Lift Station and Plant Decommissioning ***Project Number:*** 135-09369-15003
Subject:	Evaluation of Additional Force Main Project Concepts

Introduction

As part of the La Salina Lift Station and Plant Decommissioning Project, the City of Oceanside (City) will need to convey raw sewage from the La Salina Wastewater Treatment Plant collection area to the San Luis Rey Water Reclamation Facility (SLRWRF) located over seven miles away. The La Salina Force Main Alignment Feasibility Study dated January 2017 evaluated four alignment alternatives. The City has identified two additional alternatives and has asked Tetra Tech to review the feasibility of these concepts. A more thorough engineering evaluation would need to be performed if these alternatives are deemed to be suitable to the City's needs.

New Trunk Sewer Alternative

The first alternative is to combine the Oceanside Boulevard gravity flows with the La Salina force main flows near the intersection of Oceanside Boulevard and El Camino Real as shown on Figure 1. A new trunk sewer would be constructed from the Oceanside Boulevard/El Camino Real intersection and would traverse north down El Camino Real and Mesa Drive. It would then follow the alignment of the existing utility tunnel through the San Diego Gas and Electric (SDG&E) property and tie into the existing 42-inch Buena Vista Pipeline just north of Mission Avenue. The flows from the Mesa Drive gravity sewer would be added to the new trunk sewer at the intersection of Mesa Drive and El Camino Real.

Under this new alternative, the final two and one-half miles of the existing Buena Vista pipeline would see combined flows from the existing Buena Vista Lift Station, the Oceanside Boulevard and Mesa Drive gravity flows, the El Corazon development gravity flows and the La Salina force main flows. These flows are summarized below:

Table 1: Summary of Buena Vista Pipeline Flows

Influent Source	Average Flow (MGD)	Peak Flow (MGD)
Oceanside Boulevard Gravity Flows	3.4	4.8
Mesa Drive Gravity Flows	1.2	1.6
El Corazon Gravity Flows	0.25	0.44
La Salina Lift Station Flows	5.5	10.2
Buena Vista Lift Station Flows	2.2	7.7
Total Flows	**12.6**	**24.7**

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As shown on the attached Figure 2, the HGL of the Buena Vista Pipeline with the combined flows at the proposed tie-in location is approximately 106 feet. Both the existing Buena Vista Pipeline and the proposed trunk sewer will be flowing full at this location. When we follow the HGL of the new trunk sewer back to the intersection of El Camino Real and Mesa Drive, we see that the HGL is approximately 113 feet and the finished grade is approximately 96 feet. The HGL is higher than the finished grade, which means the sewer will backup and overflow the existing manhole from the Mesa Drive gravity sewer at this intersection. Due to the additional flow from the La Salina force main, the increased HGL in the new trunk sewer will overflow the existing gravity sewer system. Therefore, this alternative is not feasible and not recommended.

Utilize 24-inch Water Reclamation Line

The second alternative is to utilize the abandoned 24-inch Water Reclamation Line (Rec Line) as a casing for the proposed La Salina force main. The abandoned Rec Line currently extends from the La Salina Wastewater Treatment Plant to Whelan Lake.

The record drawings for the Rec Line indicate that the existing 24-inch pipeline was constructed in the late 1950s. It appears that the pipeline material is steel, however the record drawings do not specifically state the pipeline material. There is also no indication from the plans on the pressure class or the lining system of the pipeline. Additional appurtenances on the pipeline include air release structures, sampling station manholes, and tangential outlets. It is unknown when the pipeline was abandoned.

Under this alternative, the proposed La Salina force main would be slip-lined through the abandoned 24-inch Rec Line. According to industry standards, it is recommended that the new force main shall account for no more than 85% of the open area of the existing pipeline. If we assume that the existing 24-inch Rec Line has an internal diameter of 24-inches, then a 20-inch outer diameter pipe is the largest possible pipe that can be slip-lined. Based on information obtained from current manufacturer's catalogs, a 20-inch HDPE pipe has an internal diameter of roughly 16-inches. Therefore, the hydraulics will be evaluated using a 16-inch ID pipe.

The same design criteria that was used to evaluate the previous alignment alternatives will be used. It is listed below for reference:

- Velocity in the force main shall not be less than 2 feet per second (fps) to keep solids suspended in the flow. Preferably velocities shall be kept at no less than 3 fps to re-suspend solids that may have settled during non-operation
- Velocities in the force main shall not exceed 10 fps in order to limit headloss in the pipeline due to fiction. Increased force main headloss results in additional pumping costs
- Pressure within the force main shall not exceed 150 psi

The hydraulics were evaluated for different pumping rates and the results are summarized in the table below:

Table 2: Summary of Operating Alternatives

Alt	Description	Flow Rate (MGD)	Flow Rate (gpm)	Load Equalization Tank Volume[3] (gal)	Max TDH (ft)	hp[1]	Pressure[2] (psi)	Velocity (ft/sec)
1	20-inch HDPE Pipe (16-inch ID) (Sized for Peak Flow)	10.2	7,083	N/A	1113	2,994	482	11.3
2	20-inch HDPE Pipe (16-inch ID) (Sized for Avg Flow)	5.5	3,820	75,000	436	632	189	6.1
3	20-inch HDPE Pipe (16-inch ID) (Sized for 150 psi)	4.5	3,125	325,000	338	401	146	5.0

Notes:

1. Assumes 70% pump efficiency and 95% motor efficiency.
2. This is the maximum pressure taken in the pipeline and is located at the proposed La Salina Lift Station.
3. All alternatives would include an additional emergency storage basin.

While this alternative is feasible from a hydraulic standpoint, it limits the pumping flow rate to a maximum of 4.5 MGD and results in an increased load equalization tank size at the proposed La Salina Lift Station site. Several access pits will need to be excavated along the alignment for the slip-lining construction operations. The existing Rec Line has some sections with several angle points. This will likely result in more access pits than required for straighter installations. In addition, this alternative would require approximately 6,000 linear feet of new pipe construction as the abandoned pipeline does not extend all the way to SLRWRF. While feasible, due to the limited pumping flow rate and the unknown condition of the existing pipeline, this alternative is not recommended.

We look forward to discussing this project in further detail with the City. Please do not hesitate to contact me at 949-809-5157 should you have any questions or require additional information.

MWB/cg

Attachments

TIE INTO EXIST 42" BUENA VISTA PIPELINE

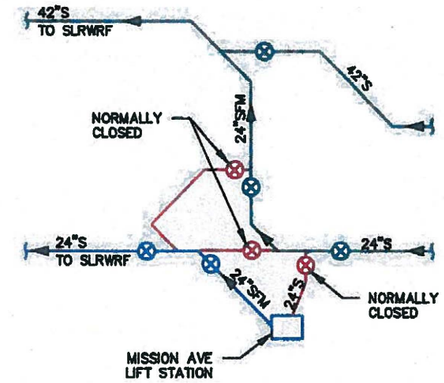
ADD MESA DR GRAVITY FLOWS

DIVERSION STRUCTURE FOR OCEANSIDE BLVD GRAVITY FLOWS AND LA SALINA FM FLOWS

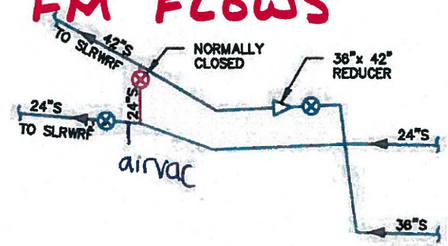
PROPOSED TRUNK SEWER

EL CAMINO REAL
MISSION AVE
SR 76
LAS VEGAS DR
HACIENDA AVE
FRONTIER DR
FOUSSAT RD
MISSION AVE
TOWNE CENTER DR
MESA DR
TONAPAH ST
GARRISON ST
OCEANSIDE BLVD
INDUSTRY ST

24" GRAVITY
FLOW FROM 24" GRAVITY LINE IS DIVERTED TO 42" GRAVITY LINE
CROSS OVER SEE DETAIL B
END 36" FM
GENERAL LOCATION OF UTILITY TUNNEL
24" GRAVITY
36" FM
42" FM
BEGIN 36" FM
GENERAL LOCATION OF AIR RELEASE STRUCTURE
SEE DETAIL A
42" GRAVITY
24" GRAVITY
42" GRAVITY
24" FM
TO SLRWRF
TO SLRWRF
MISSION AVE LIFT STATION
FROM BUENA VISTA LIFT STATION
30" FM
24" FM
24" GRAVITY
42" GRAVITY
6" PIPELINE
MAR LADO LIFT STATION
TO LA SALINA WWTP



DETAIL 'A'



DETAIL 'B'

SITE PLAN
SCALE: 1"=800'

GRAPHIC SCALE
0 800'
SCALE: 1" = 800'

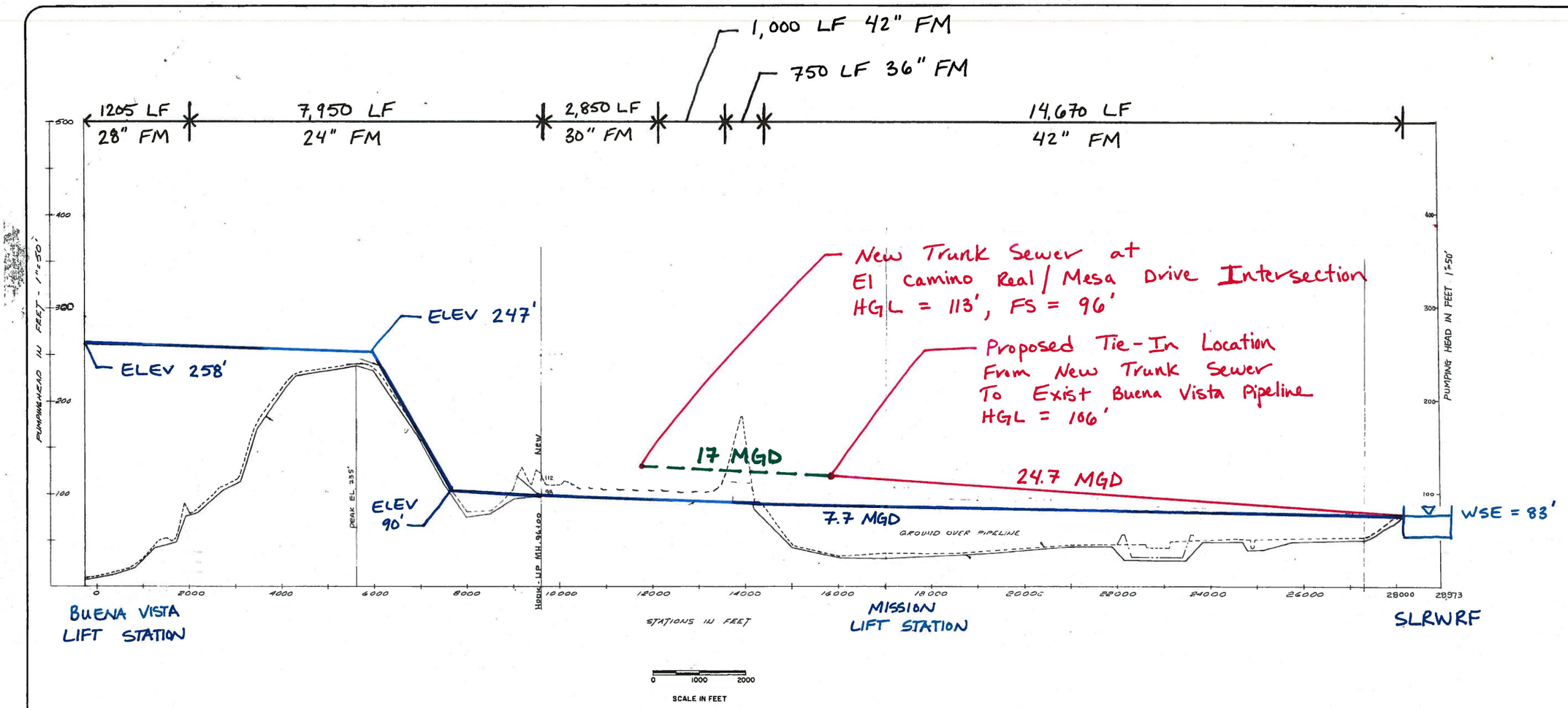
SUB-SYSTEMS
- BUENA VISTA LIFT STATION & MESA/GARRISON GRAVITY
- MISSION AVE LIFT STATION
- NOT USED/STAND-BY
- PROPOSED LA SALINA FORCE MAIN
- PROPOSED TRUNK SEWER

MESA/GARRISON AREA
EXISTING TRUNK SEWER
SYSTEM

DUDEK

FIGURE 1

4/10/2014 1:37:03 PM P:\101.Engineering\Oceanside\7856 OdorControl&ChemEval\06-Design\CAD 7856\7856 FIGURE TRUNK SEWER



HGL for Buena Vista Lift Station (7.7 MGD ≈ 5,350 gpm)

HGL for Combined Flows in Buena Vista Pipeline (24.7 MGD ≈ 17,155 gpm)

HGL for New Trunk Sewer (17 MGD ≈ 11,800 gpm)

NOTE:
ALL PIPING IN THIS GRAVITY / FORCE MAIN SHALL BE CLASS 150

AS BUILT 3-75

RALPH STONE AND COMPANY, INC.
10954 SANTA MONICA BOULEVARD LOS ANGELES CALIFORNIA 90025
478-1501
879-1115

CITY OF OCEANSIDE, CA.

APPROVED
ALTON L. RUDEN (R.E. N° 10163) - CITY ENGINEER

FORCE MAIN
HYDRAULIC PROFILE
BV, ESLR to NSLR

DR S.W. | JOB 175-1 | DWG NO 4.0-C4 | REV C
DES S.S. | SCALE 1"=50' | DATE 5-8-71 | 11/20/73
APP W

S-664

FIGURE 2

DRAWING NUMBER
S-664

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La Salina Lift Station and Treatment Plant Decommissioning

Appendix F. La Salina Force Main Alignment Feasibility Study

City of Oceanside

La Salina Lift Station and Treatment Plant Decommissioning Project

La Salina Force Main Alignment Feasibility Study

Draft



TETRA TECH

July 2017

La Salina Force Main Alignment Feasibility Study

July 2017

PREPARED FOR

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Tetra Tech Project 135-09369-15003

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1. INTRODUCTION

BACKGROUND

The La Salina Wastewater Treatment Plant (Treatment Plant) was originally constructed in 1948 and has been expanded and rehabilitated over the years. Since significant repairs to the Treatment Plant are necessary, the City of Oceanside (City) performed an evaluation of potential alternatives and in November 2014, the City Council approved the recommendation to decommission the aging La Salina Wastewater Treatment Plant. This project consists of demolishing the Treatment Plant and replacing it with a raw wastewater pump station to convey wastewater from the Treatment Plant collection area to San Luis Rey Water Reclamation Facility located over seven miles away.

As part of this project, the City would like to evaluate alternatives to convey sewage from the decommissioned Treatment Plant to the San Luis Rey Water Reclamation Facility. To assist the City in their evaluation this study will provide an analysis of alternatives considering force main alignment, hydraulics, impacts to the existing system, analysis of additional easements and/or right-of-way required, construction duration, and costs.

2. ALIGNMENT ALTERNATIVES

Five alignment alternatives from the proposed La Salina Lift Station to the San Luis Rey Water Reclamation Facility have been selected for analysis within this report.

- Alternative 1: An alignment that runs parallel to the existing 16-inch Fallbrook Outfall and ties into the existing Mission Force Main at Pala Road
- Alternative 2: An alignment that runs along Mission Avenue and ties into the existing Mission Force Main, just after the Mission Lift Station
- Alternative 3A: An alignment that runs along Oceanside Boulevard and ties into the existing Mission Force Main, just after the Mission Lift Station
- Alternative 3B: An alignment that runs along Oceanside Boulevard and empties into the future El Corazon Lift Station, which then pumps flow into the existing Buena Vista Pipeline
- Alternative 3C: An alignment that runs along Oceanside Boulevard and ties into the existing Buena Vista Pipeline

An overall map of the alignment alternatives is shown in Figure 1. Cross sections along Mission Avenue and Oceanside Boulevard are shown in Figures 2 through 10. Detailed plan views of the tie-in locations in the Mesa/Garrison Area are shown in Figures 11-13.

Due to environmental concerns with constructing adjacent to the San Luis Rey River and permitting concerns with constructing within Caltrans right-of-way, Alternative 1 has been considered not a viable option, and no further analysis has been performed.

3. HYDRAULIC ANALYSIS AND IMPACTS TO EXISTING SYSTEM

FLOW RATES

Based on conversations with the City, the average and peak influent flows to the La Salina Wastewater Treatment Plant are as follows:

- Average flow: 5.5 million gallons per day (MGD)
- Peak flow: 10.2 MGD

The City also provided flow data from a flow meter located near the headworks of the treatment plant. The flow meter readings were collected over four different dates; for each date the flow rate was taken at 5 minute increments over a period of 24 hours. The flow meter data was analyzed in a memo by Tetra Tech, presented to the City on May 10, 2016, entitled "Evaluation of Mission Avenue Lift Station." The average and peak flow rates from the flow meter readings are as follows:

- Flow meter average flow: 3.1 MGD
- Flow meter peak flow: 9.7 MGD

The flow meter data is not indicative of typical treatment plant operations due to the small sample size, however it does show that peak influent flows are close to the provided flow rate of 10.2 MGD.

DESIGN CRITERIA

The following design criteria shall be used in evaluating the La Salina Force Main:

- Velocity in force mains shall not be less than 2 feet per second (fps) to keep solids suspended in the flow. Preferably velocities shall be kept at no less than 3 fps to re-suspend solids that may have settled during non-operation
- Velocities in the force main shall not exceed 10 fps in order to limit headloss in the pipeline due to friction. Increased force main headloss results in additional pumping costs
- Pressure within the force main shall not exceed 150 psi
- La Salina Pumps will pump a maximum of 5.5 MGD, the average flow. Any additional flow will be captured in equalization basins and pumped during periods of low flow

The following pipe sizes have been evaluated at the maximum pumped flow rate of 5.5 MGD from the proposed La Salina Lift Station:

Table 1: Summary of Pipe Sizes and Velocities

Pipe Inside Diameter (inches)	Velocity at 5.5 MGD (fps)
16	6.1
18	4.8
20	3.9
24	2.7
30	1.7

The table above shows that the velocity in a 20-inch inside diameter pipeline provides a cleaning velocity high enough to move solids through the pipeline and velocity low enough to limit excess headloss. A 24-inch diameter HDPE pipe has an inside diameter of approximately 20-inches. A 24-inch HDPE force main will be used for analysis in this report.

OPERATING ALTERNATIVES

The four remaining alignment alternatives 2, 3a, 3b, and 3c have been evaluated for a 20-inch, inside diameter force main from the proposed La Salina Lift Station to the tie in points shown in Figure 1. The table below summarizes the results:

Table 2: La Salina Force Main Evaluation

Alternative	Flow (MGD)	Total hp* at the La Salina LS	Max Pressure at the La Salina LS (psi)	Length of New Force Main (ft)	Required Static Lift (ft)	Friction Loss (ft)	Max TDH** (ft)	Max HGL (ft)
Alternative 2 (Mission Ave to Mission FM)	5.5	409	122	25,000	123	153	282	271
Alternative 3a (Oceanside Blvd to Mission FM)	5.5	358	107	24,000	91	150	247	236
Alternative 3b (Oceanside Blvd to El Corazon LS)	5.5	254	76	19,000	115	54	175	164
Alternative 3c (Oceanside Blvd to Buena Vista Pipeline)	5.5	273	82	17,000	115	67	188	177

*Assumes 70% pump efficiency and 95% motor efficiency

**Minor losses through the proposed La Salina Lift Station have been assumed to be 6 feet for all alternatives

The table above shows that for all alternatives the maximum pressure in the proposed La Salina force main is below the 150 psi pressure class of the proposed pipe. However, each alternative will require pumps of different horsepower (hp) at the lift station. The La Salina Lift Station will require a minimum of four pumps, with the capability of pumping the complete 5.5 MGD through two of the pumps, while two additional pumps are for standby. The following is the minimum pump hp for each alternative:

- Alternative 2: Four 200 hp pumps
- Alternative 3a: Four 200 hp pumps
- Alternative 3b: Four 125 hp pumps
- Alternative 3c: Four 150 hp pumps

HYDRAULIC IMPACTS TO EXISTING SYSTEM

Each alignment alternative analyzed stops short of the San Luis Rey Water Reclamation Facility and uses the existing sewer collection system to carry flows the remainder of the way. The impacts to the existing sewer collection system for each of the four remaining alternatives is discussed below.

Alternatives 2 and 3a

Alternatives 2 and 3a transport the La Salina flows along Mission Avenue and Oceanside Boulevard, respectively, then tie into an existing 24-inch diameter sewer force main that carries flow from the Mission Avenue Lift Station to the San Luis Rey Water Reclamation Facility (See Figure 11). For these two alternatives, impacts to the Mission Avenue Lift Station and Mission Force Main have been analyzed to determine what upgrades, if any, to the lift station or pipeline are required.

Tetra Tech developed a system curve for the Mission Avenue Lift Station force main using the existing record drawings provided by the City of Oceanside. The City also provided current flow data for the lift station and Tetra Tech made a site visit to confirm current lift station operation.

The Mission Avenue Lift Station has a total of four pumps, but only one pump is used for normal daily operation. A second pump is used in rare instances, such as a major storm event. The operational sequence is varied to maintain even pump wear. The lift station contains two identical wet wells, each with two pump intakes. The pumps are equipped with 150 horsepower motors with VFDs, however, the VFDs are currently locked on a speed curve and operating as constant speed pumps. The Mission Avenue pumps should continue to operate as constant speed pumps if the proposed La Salina Lift Station uses VFD pumps. If both lift stations use VFD pumps, the two sets of pumps will continually cycle back and forth and compete against each other. The pump is triggered "on" at a wet well elevation of 12 feet and triggered "off" at a wet well elevation of 6 feet.

During normal operation when the pump is "on", the flowmeter on the discharge line measures approximately 3,500 gpm depending on which pump is being used. This flow measurement is in agreement with the flow data provided by the City as well as the calculated system curve. When two pumps are required, the expected lift station discharge is 6,000 gpm at 120 feet TDH per the calculated system curve. The impacts to the Mission Lift Station at peak flow, due to the addition of 5.5 MGD (3820 gpm) of sewage from the proposed La Salina Lift Station for Alternatives 2 and 3a, are summarized in the tables below:

Table 3: Summary of Impacts of Additional Flow into Mission Lift Station (Alternative 2 – Mission Avenue)

Peak Flow in Mission FM (gpm)	Velocity in Mission 24" ID FM (ft/s)	HGL at Mission LS (ft)	Max Pressure at Mission LS (psi)	Max TDH	Required HP (per pump)	Additional HP required (per pump)
9820 (La Salina + Mission LS w/ 2 pumps)	10.0	199	87	201	250	100

Table 4: Summary of Impacts of Additional Flow into Mission Lift Station (Alternative 3a – Oceanside Boulevard)						
Peak Flow in Mission FM (gpm)	**Velocity in Mission 24" ID FM (ft/s)**	**HGL at Mission LS (ft)**	**Max Pressure at Mission LS (psi)**	**Max TDH**	**Required HP (per pump)**	**Additional HP required (per pump)**
9820 (La Salina + Mission LS w/2 pumps)	10.0	165	72	167	200	50

The following is a list of impacts to the Mission Lift Station and 24-inch Mission Force Main due to Alternatives 2 and 3a:

- For both alternatives, velocity in the Mission Force Main at peak flow is high, however still within an acceptable range
- For both alternatives, the pressures in the Mission Force Main will be within the limits of the existing Class 150 pipe
- Both alternatives require the existing 150 hp pumps and motors in the Mission Lift Station to be upgraded. Alternative 2 requires 250 hp pumps, while Alternative 3a requires 200 hp pumps
- Due to the increased pump size the electrical equipment and backup generator will need to be evaluated and upsized for the larger pump and motors.

Alternative 3b

Alternative 3b transports La Salina flows along Oceanside Boulevard to the wet well of the future El Corazon Lift Station. Under this alternative, the El Corazon wet well would collect sewage flows from the proposed La Salina Lift Station, the proposed El Corazon Development and the existing gravity sewer mains from Mesa Drive and Oceanside Boulevard. The sewage is then pumped from the El Corazon Lift Station and ties into the existing Buena Vista Pipeline near the intersection of Oceanside Boulevard and El Camino Real (See Figure 12).

Alternative 3b was analyzed in a memo to the City dated January 9, 2017. The following is a summary of the impacts to the future El Corazon Lift Station and the existing Buena Vista Lift Station and pipeline due to Alternative 3b:

- The future El Corazon Lift Station was originally sized for 0.44 MGD peak flow and under Alternative 3b it would be increased to handle 24.7 MGD peak flow.
- The City will need to confirm the location of the future El Corazon Lift Station site and confirm it will be large enough to construct the required lift station facility.
- The additional flows into the Buena Vista Pipeline from the future El Corazon Lift Station will not impact the existing pumps or operation of the existing Buena Vista Lift Station or pipeline.

Alternative 3c

Under Alternative 3c, the flows from the proposed La Salina Lift Station would be pumped directly into the Buena Vista Pipeline at the intersection of Oceanside Boulevard and El Camino Real without using the El Corazon Lift Station (See Figure 13). Similarly to Alternative 3b, the additional flows into the Buena Vista Pipeline from the La Salina Force Main will not impact the existing pumps or operation of the existing Buena Vista Lift Station. This is due to the high hydraulic grade line (HGL) needed at the Buena Vista Lift Station to

pump those flows over the hill before the tie-in point (See Figure 14). It is important to note that there is a potential for backflow into the proposed La Salina Force Main in the event of a break in the existing Buena Vista Pipeline. This risk can be mitigated with a check valve and valve vault on the proposed La Salina Force Main near the tie-in point.

Tetra Tech also looked at what impact the additional La Salina flows would have on the existing Mesa Drive and Oceanside Boulevard gravity sewers which also tie into the existing Buena Vista Pipeline just downstream of the utility tunnel. The HGL of the Buena Vista Pipeline and gravity mains is shown on Figure 14. When we follow the HGL of the existing 24-inch gravity sewers back to the intersection of Mesa Drive and El Camino Real, we see that the HGL is approximately 114 feet and the finished grade is approximately 96 feet. When we follow the HGL of the gravity system back to the intersection of Oceanside Boulevard and El Camino Real, we see that the HGL is approximately 117 feet and the finished grade is approximately 110 feet. Therefore, the additional flows from the La Salina Force Main will overflow both the existing gravity sewers on Mesa Drive and Oceanside Boulevard.

It does not appear to be feasible to re-route the gravity lines and tie into the existing Buena Vista Pipeline downstream of the La Salina Force Main. This is because the HGL is above the finished grade in this area and will cause the gravity sewers to surcharge. Alternatively, the gravity sewer lines can be replaced as pressure pipelines upstream of their tie-in locations until the HGL falls below the finished grade. In the case of the Mesa Drive gravity sewer, the pipeline would need to become a pressure pipeline for approximately 1,200 linear feet upstream of the intersection of Mesa Drive and El Camino Real. This would impact an existing 8-inch gravity sewer that ties in 500 feet upstream of the Mesa Drive/El Camino Real intersection. In the case of the Oceanside Boulevard gravity sewer, the pipeline would need to become a pressure pipeline for approximately 3,000 linear feet upstream of the intersection of the Oceanside Boulevard and El Camino Real. A more detailed analysis of the gravity sewer impacts would be required to confirm this cursory evaluation.

The following is a summary of the impacts to the existing Buena Vista Lift Station and pipeline, and the existing gravity sewer mains due to Alternative 3c:

- The additional flows into the Buena Vista Pipeline from the proposed Las Salina Lift Station will not impact the existing pumps or operation of the existing Buena Vista Lift Station or pipeline.
- A check valve, isolation valve and valve vault will be needed on the proposed La Salina Force Main to prevent potential backflow from the existing Buena Vista Pipeline.
- The existing gravity sewer mains on Mesa Drive and Oceanside Boulevard will need to be re-aligned or pumped through a lift station to prevent surcharging.

4. CONSTRUCTABILITY

Each alternative has different constructability challenges related to the required construction methods, traffic impacts, and public impacts. The following section will compare and highlight constructability issues related to each alternative.

CONSTRUCTION METHODS ANALYSIS

Each alignment will use conventional open-cut construction and/or tunneling to cross environmentally sensitive areas, busy intersections, rail roads, or freeways.

Construction of a new pipeline by conventional open-cut excavation is considered to have less construction risk than trenchless construction. However, open-cut construction requires room for access and off-loading materials and spoil. A minimum work area width for the construction of a 20-inch inside diameter pipeline is approximately 20 to 24 feet. At this width there is room to spoil off to the side of the trench. As the width of work area is decreased in-line construction is required and there becomes no room to spoil off to the side of the trench, resulting in slower production rates. For the majority of the proposed alignments in-line construction is not required because a work area 20 to 24 feet wide is available. However, the City has indicated that night work will be required for force main construction along Mission Avenue and Oceanside Boulevard. Night work results in reduced production rates because of additional setup and precautions taken required to conduct work safely. Due to the night work, Tetra Tech has assumed an open-cut production rate of 50 linear feet per day, for all open-cut construction.

Two trenchless construction methods have been considered for this project. Bore and jack construction is assumed for tunnels 700 linear feet or less and microtunneling would be used for tunnels greater than 700 linear feet.

Bore and jack construction consists of a steel casing being advanced by a jacking machine. At the head of the steel casing is an auger that is tunneling the ground. The jacking machine exerts force on the end of the casing to push the pipe through the opening created by the auger as well as advancing the auger. Bore and jack drive lengths greater than 700 feet are difficult to accomplish and rarely done.

Microtunneling uses a remote-controlled, guided self-excavating boring machine that provides continuous support at the face of the tunnel while the casing pipe is jacked in behind the boring machine. Remotely controlled excavation and spoil removal from the tunnel provides greater control of the cutting head and keeps the tunnel on line and grade more accurately than the bore and jack method, where there is no directional cutting head. Microtunneling can accomplish tunnels of up to 3,000 linear feet in length.

Both trenchless construction methods require tunnel entry and receiving pits large enough for pipe, casing, and tunneling equipment. The entry and exit pits can require significant shoring depending on the depth of the tunnel. The estimated production rate of both tunneling methods is approximately 100 linear feet per day.

IMPACTS TO TRAFFIC AND PUBLIC ACTIVITY

Impacts to traffic and public activity can result in slower production rates, and can be dangerous for the public and construction workers. The preliminary cross sections shown in Figures 2 through 10 show that two-way traffic throughout construction, in all alternatives, will be feasible. Therefore, the impacts to traffic were not used in this analysis to determine the best alignment, as no alternative stands out as having more significant traffic impacts than the others. Additionally, all three alternatives are considered to have a high public impact, as they pass the Oceanside Transit Center, schools, churches, commercial and industrial zones. Therefore, impacts to the public were not considered in this analysis, as no alternative has significantly more or less public impact than the others.

5. EASEMENTS AND RIGHT-OF-WAY

The four alternative alignments have been analyzed from an easement and right-of-way perspective. Each alignment alternative has different challenges in obtaining additional easement or property required for construction.

Alternative 2 (Mission Avenue to Mission Force Main): The alignment along Mission Avenue will not require any additional easements or right-of-way.

Alternative 3a (Oceanside Boulevard to Mission Force Main): The Oceanside Boulevard alignment parallels the existing 24-inch Land Outfall Pipeline and the existing 30-inch/42-inch Buena Vista Pipeline through San Diego Gas and Electric (SDG&E) property as the alignment heads north of Mesa Drive. The City currently has an 8-foot and 10-foot wide easement directly adjacent to one another through the SDG&E property. These two easements combine for a total of 18-feet of easement, and contain two 24-inch force mains, a 10-inch force main, a 42-inch force main, and a 24-inch gravity main. There is no additional room within the City's existing easements for an additional 20-inch ID force main. To construct this portion of pipeline the City will need to obtain approximately 3,700 linear feet of easement through SDG&E property. A minimum easement width of 20-feet will be required to conduct conventional open-cut construction where spoils can be set to the side of the trench.

Alternative 3b (Oceanside Boulevard to El Corazon Lift Station): The alignment along Oceanside Boulevard to the El Corazon Lift Station stays completely within the public right-of-way. However, the available space to construct the El Corazon Lift Station is unknown at this time. The required increase in lift station capacity due to the La Salina flows may require additional right-of-way to be acquired.

Alternative 3c (Oceanside Boulevard to Buena Vista Pipeline): The alignment along Oceanside Boulevard to the Buena Vista Pipeline at the intersection of Oceanside Boulevard and El Camino Real will not require any additional easements or right-of-way.

6. CONSTRUCTION DURATION

The estimated construction duration of the proposed force main was determined based on the following construction production rates and estimated durations of system improvements:

- Open-cut construction (night work) will have a production rate of 50 feet per day
- Tunneling will have a production rate of 100 feet per day
- El Corazon Lift Station construction (Alternative 3b) will have a duration of 540 days
- Upgrading Mission Lift Station to 200 or 250 hp pumps (Alternative 2 and 3a) will take approximately 120 days

The following table lists the anticipated construction durations for each force main alternative. For the purposes of this estimate, permitting requirements and environmental mitigation measures were not considered.

Table 5: Probable Construction Duration

Construction Task	Alignment 2 (Calendar Days)	Alignment 3a (Calendar Days)	Alignment 3b (Calendar Days)	Alignment 3c (Calendar Days)
Open-cut construction	655 (23,300 LF)	610 (21,700 LF)	500 (17,700 LF)	440 (15,700 LF)
Tunneling	17 (1,700 LF)	23 (2,300 LF)	13 (1,300 LF)	13 (1,300 LF)
Subtotal	***672***	***633***	***513***	***453***
Mission LS Improvements	120	120	0	0
El Corazon LS Construction	0	0	540	0
Gravity Sewer Main Improvements	0	0	0	Unknown**
Total* (including system improvements)	***792***	***753***	***1053***	***453+****

*Durations for the Mission Lift Station Improvements, El Corazon Lift Station Construction, and Gravity Sewer Main Improvements are not part of the force main construction, and it is assumed that these improvements can be done concurrently with the force main work. The construction duration used for comparison will be the La Salina Force Main construction duration.

**The construction duration for the gravity sewer main improvements is unknown at this time and requires further evaluation during a subsequent phase to determine the best option.

7. CONSTRUCTION COSTS

The total construction costs for each alignment alternative will include the cost for the construction of the La Salina Force Main, the cost for the construction of the La Salina Lift Station, and the cost for the required upgrades to the existing system. For the purposes of this preliminary study it has been assumed that the cost to construct the La Salina Lift Station will be approximately the same for all three alternatives, therefore La Salina Lift Station costs have not been included. The preliminary, estimated La Salina Force Main construction costs are shown in the table below. Back up cost estimates for each alternative can be found in the attached Exhibits B, C, D, and E.

Table 6: La Salina Force Main Order of Magnitude Probable Construction Costs

Alternative	Probable Construction Costs
Alternative 2	$25.9 Million
Alternative 3a	$27.5 Million
Alternative 3b	$19.8 Million
Alternative 3c	$19 Million

Preliminary estimated costs for system improvements are shown in the table below. Back up cost estimates can be found in the attached Exhibits F and G.

Table 7: Probable Construction Costs of Upgrades to the Existing System

Alternative	Description of Upgrade	Probable Construction Costs
Alternative 2	Upgrade existing Mission LS to accommodate 250 hp pumps**	$4.1 Million
Alternative 3a	Upgrade existing Mission LS to accommodate 200 hp pumps**	$4.1 Million
Alternative 3b	Future El Corazon LS	$8.2 Million*
Alternative 3c	Gravity Sewer Main Improvements at Mesa Drive and Oceanside Boulevard	Unknown***

*The cost of the El Corazon Lift Station without the flows from La Salina is estimated to be approximately $1 million based on the City's sewer master plan. Tetra Tech has estimated a total construction cost of $9.2 million for the construction of the El Corazon Lift Station with flows from La Salina shown in Exhibit F. The $8.2 million shown is the difference between Tetra Tech's estimate and the City's master plan estimate.

**The costs to upgrade the Mission Lift Station to 200 and 250 hp pumps were assumed to be approximately the same, as both alternatives will require the same construction tasks.

***The cost for the gravity sewer main improvements is unknown at this time and requires further evaluation during a subsequent phase to determine the best option.

8. EVALUATION OF ALIGNMENT ALTERNATIVES

In order to more easily compare the options, the four viable alignment alternatives were evaluated using the following evaluation factors:

- Impacts to system and existing facilities
- Constructability
- Easements and right-of-way
- Construction duration
- Cost

The viable alignment alternatives and evaluation factors are presented in the table below.

Table 8: Alignment Alternative Evaluation Matrix

Evaluation Factor	Alternative 2 (Mission Avenue)	Alternative 3a (Oceanside Boulevard to Mission Force Main)	Alternative 3b (Oceanside Boulevard to El Corazon Lift Station)	Alternative 3c (Oceanside Boulevard to Buena Vista Pipeline)
Impacts to System and Existing Facilities	• 250 hp pumps at Mission LS • Increased Mission LS O&M costs • Improvements to accommodate larger pumps and motors at Mission LS	• 200 hp pumps at Mission LS • Increased Mission LS O&M costs • Improvements to accommodate larger pumps and motors at Mission LS	• Increased size of El Corazon LS	• Gravity sewer main improvements at Mesa Drive and Oceanside Boulevard
Constructability	• 2 Bore and Jack crossings – RR **(430 LF)** – Canyon/Mission Intersection **(250 LF)** • 1 Microtunnel crossing – I-5 crossing **(1000 LF)**	• 1 Bore and jack crossing – RR **(350 LF)** • 2 Microtunnel crossings – I-5 crossing **(1000 LF)** – Mesa Drive **(1000 LF)**	• 1 Bore and jack crossing – RR **(350 LF)** • 1 Microtunnel crossing – I-5 crossing **(1000 LF)**	• 1 Bore and jack crossing – RR **(350 LF)** • 1 Microtunnel crossing – I-5 crossing **(1000 LF)**
Easements/ Right-of-way	• No additional easements or right-of-way are required	• Approx. **3700 LF of 20-foot wide easement** required through SDG&E property between Mesa Drive and Mission Ave	• It is unknown if additional right-of-way will be required to construct the El Corazon Lift Station	• No additional easements or right-of-way are required
Construction Duration	672 Calendar days	633 Calendar days	513 Calendar days	453 Calendar days

Table 8: Alignment Alternative Evaluation Matrix				
Evaluation Factor	**Alternative 2 (Mission Avenue)**	**Alternative 3a (Oceanside Boulevard to Mission Force Main)**	**Alternative 3b (Oceanside Boulevard to El Corazon Lift Station)**	**Alternative 3c (Oceanside Boulevard to Buena Vista Pipeline)**
Cost	• $25.9 Million force main construction cost • $4.1 Million Mission LS improvements • **Total Cost: $30 Million**	• $27.5 Million force main construction cost • $4.1 Million Mission LS improvements • **Total Cost: $31.6 Million**	• $19.8 Million force main construction cost • $9.2 Million El Corazon LS Construction • **Total Cost: $29 Million**	• $19 Million force main construction cost • Unknown gravity sewer improvements* • **Total Cost: $19 Million***

*The cost for the Gravity Sewer Main Improvements is unknown at this time and requires further evaluation during a subsequent phase to determine the best option.

Each evaluation factor shown above has been assigned a weight and each alternative will be ranked and scored based on how significant of an impact the issue is. The total weight and weighting criteria for each evaluation factor is summarized below:

Table 9: Alternative Assessment Weighting		
Evaluation Factor	**Weight**	**Weighting Criteria**
Impacts to System and Existing Facilities	15	• Score of 15: Impacts to existing lift stations and pipelines • Score of 10: Impacts to future City projects • Score of 0: No impacts on the existing system
Constructability	30	• Score of 20: Two microtunneling crossings • Score of 15: One microtunneling crossing • Score of 10: No microtunneling crossings • Additional 5 for each bore and jack crossing
Easements and Right-of-Way	20	• Score of 20: Additional easement or right-of way is required • Score of 5: An unknown amount of easement or right-of way is required • Score of 0: No additional property is required
Construction Duration	5	• Score of 5: Over two years construction duration • Score of 3: Over one year construction duration • Score of 1: Less than one year construction duration
Cost	30	• Score of 30: Cost greater than $30 million • Score of 25: Cost greater than $25 million • Score of 20: Cost greater than $20 million • Score of 10: Cost less than $20 million
TOTAL	**100**	**A high total score equates to the least desirable alternative**

Each Alternative has been scored below in Table 10, based on the Alternative weighting indicated in Table 9 above.

Table 10: Alternative Ranking Matrix				
Evaluation Factor	**Alternative 2 (Mission Avenue to Mission FM)**	**Alternative 3a (Oceanside Boulevard to Mission FM)**	**Alternative 3b (Oceanside Boulevard to El Corazon Lift Station)**	**Alternative 3c (Oceanside Boulevard to Buena Vista Pipeline)**
Impacts to System and Existing Facilities (Weight: 0 – 15)	15	15	10	15
Constructability (0 - 30)	25	25	20	20
Easements/Right-of-way	0	20	5	0
Construction Duration	5	5	5	5
Cost	25	30	25	25
TOTAL	**70**	**95**	**65**	**65**

SUMMARY

Table 10 indicates that the most feasible alignments are Alternative 3b and Alternative 3c. However, Alignment 3b has the most unknowns associated due to the amount of land required and the possible location of the future El Corazon Lift Station. The advantage of Alternative 3c is that the La Salina flows do not have to be pumped twice (eliminates pumping to El Corazon). However, some type of lift station or gravity line re-alignment for Mesa Drive and Oceanside Boulevard gravity sewers will be required. The existing pumps at the Buena Vista Lift Station would not be impacted by the additional La Salina flows due to the high HGL needed at Buena Vista. Tetra Tech recommends that the City proceed with investigating Alternative 3c and gravity sewer main improvements for the Mesa Drive and Oceanside Boulevard gravity sewers.

EXHIBITS

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Project: La Salina Lift Station and Plant Decommissioning

Sheet No. 1 of 1
Job No. 135-09369-15003
Computed by: MBL
Checked by: MWB Date: 7/12/2017

EXHIBIT A
Summary of Project Alternatives

	Project Alternative 2 Mission Ave to Mission Force Main		**Project Alternative 3a Oceanside Blvd to Mission Force Main**		**Project Alternative 3b Oceanside Blvd to El Corazon Lift Station**		**Project Alternative 3c Oceanside Blvd to Buena Vista Pipeline**	
Description	Pump La Salina flows along Mission Ave into the Mission FM to SLRWRF		Pump La Salina flows along Oceanside Blvd into the Mission FM to SLRWRF		Pump La Salina flows along Oceanside Blvd to El Corazon Lift Station. Pump flows a second time from El Corazon Lift Station to SLRWRF		Pump La Salina flows along Oceanside Blvd into the Buena Vista Pipeline to SLRWRF	
New La Salina Forcemain Length (feet)	25,000		24,000		19,000		17,000	
Peak Pumped Flows at La Salina (mgd)	5.5		5.5		5.5		5.5	
Peak Pumped Flows at La Salina (gpm)	3820		3820		3820		3820	
HGL at La Salina Lift Station (feet)	271		236		164		177	
Max TDH at La Salina (feet)	282		247		175		188	
Total hp at La Salina (See Note 1)	409 (2 pumps at 200 hp)		358 (2 pumps at 200 hp)		254 (2 pumps at 125 hp)		273 (2 pumps at 150 hp)	
Preliminary Costs (in millions of dollars) (See Note 2)	La Salina Lift Station	$14.8	La Salina Lift Station	$14.8	La Salina Lift Station	$14.8	La Salina Lift Station	$14.8
	New FM from La Salina to Mission FM down Mission Ave (See Note 3)	$25.9	New FM from La Salina to Mission FM down Oceanside Blvd (See Note 3	$27.5	New FM from La Salina to El Corazon down Oceanside Blvd (See Note 3)	$19.8	New FM from La Salina to Buena Vista Pipeline down Oceanside Blvd (See Note 3)	$18.4
	Impacts to Mission Lift Station	$4.1	Impacts to Mission Lift Station	$4.1	Impacts to Buena Vista Lift Station	$0	Impacts to Buena Vista Lift Station	$0
	El Corazon Lift Station (See Note 4)	$1	El Corazon Lift Station (See Note 4)	$1	El Corazon Lift Station	$9.2	El Corazon Lift Station (See Note 4)	$1
	Gravity Sewer Main Improvements	$0	Gravity Sewer Main Improvements	$0	Gravity Sewer Main Improvements	$0	Gravity Sewer Main Improvements	Unk (See Note 5)
	La Salina WWTP Decommissioning	$15	La Salina WWTP Decommissioning	$15	La Salina WWTP Decommissioning	$15	La Salina WWTP Decommissioning	$15
	Total	***$60.8***	***Total***	***$62.4***	***Total***	***$58.8***	***Total***	***$49.2***

Notes:
1. Assumes 70% pump efficieny and 95% motor efficiency.
2. The preliminary costs are rough order of magnitude type costs.
3. Night work has been assumed for the construction of the pipeline.
4. Estimates for the El Corazon Lift Station without the La Salina flows are estimated from the City's 2015 Sewer Master Plan, Figure 9.1, "Lift Station Construction Cost vs. Capacity Curve."
5. Requries further evaluation during a subsequent phase to determine the best option.

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Force Main Alignment Study

Sheet No. 1 of 1
Job No. 135-09369-15003
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EXHIBIT B
Preliminary - Order of Magnitude Probable Construction Costs
New Force Main from La Salina Lift Station to Mission Force Main along Mission Avenue
Alternative 2

Item No.	Estimated Qty	Unit	Description	Unit Price	Total Price
	1	LS	Mobilization and Demobilization	$1,010,000	$1,010,000
	1	LS	Sheeting, Shoring and Trench Protection	$400,000	$400,000
	23320	LF	Construct 24" Sewer Force Main	$500	$11,660,000
	430	LF	Construct 42" Steel Casing (Bore and Jack) with 24" Carrier Pipe at Railroad Crossing	$3,600	$1,548,000
	1000	LF	Construct 42" Steel Casing (Microtunnel) with 24" Carrier Pipe at I-5 Freeway Crossing	$3,300	$3,300,000
	250	LF	Construct 42" Steel Casing (Bore and Jack) with 24" Carrier Pipe at Canyon/Mission Intersection	$3,600	$900,000
	1	LS	Hot Tap Connection (From New 24" Force Main to Existing 24" Mission Force Main)	$30,000	$30,000
	1	LS	Force Main Appurtenances (AV, BO, etc.)	$700,000	$700,000
	25000	LF	Testing of Sewer Force Main	$5	$125,000
	600000	SF	Grind and Cap Pavement	$2	$1,200,000
	1	LS	Traffic Control	$750,000	$750,000
			SUBTOTAL		**$21,623,000**
			CONTINGENCY (20%)		**$4,277,000**
			TOTAL		**$25,900,000**

This cost estimate is an estimate only. These figures are supplied as a guide only. This firm is not responsible for fluctuation in cost of material, labor, or components, or unforeseen contingencies.

Assumptions:

1. Imported backfill has been assumed.
2. Assumed City of Oceanside will require a grind and cap over a width of two lanes (half the street).
3. Mobilization and Demobilization has been assumed at 5% of the cost.
4. Sheeting, Shoring and Trench Protection has been assumed at 2% of the cost.
5. Force Main Appurtenances have been assumed at 4% of the cost.
6. Night work has been assumed for the construction of the pipeline.

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Client: City of Oceanside
Project: La Salina Lift Station and Plant Decommissioning
Force Main Alignment Study

Sheet No. 1 of 1
Job No. 135-09369-15003
Computed by: KMB
Checked by: MWB Date: 7/12/17

EXHIBIT C
Preliminary - Order of Magnitude Probable Construction Costs
New Force Main from La Salina Lift Station to Mission Force Main along Oceanside Boulevard
Alternative 3a

Item No.	Estimated Qty	Unit	Description	Unit Price	Total Price
	1	LS	Mobilization and Demobilization	$1,070,000	$1,070,000
	1	LS	Sheeting, Shoring and Trench Protection	$430,000	$430,000
	21650	LF	Construct 24" Sewer Force Main	$500	$10,825,000
	350	LF	Construct 42" Steel Casing (Bore and Jack) with 24" Carrier Pipe at Railroad Crossing	$3,600	$1,260,000
	1000	LF	Construct 42" Steel Casing (Microtunnel) with 24" Carrier Pipe at I-5 Freeway Crossing	$3,300	$3,300,000
	1000	LF	Construct 42" Steel Casing (Micortunnel) with 24" Carrier Pipe at Mesa Drive	$3,300	$3,300,000
	1	LS	Hot Tap Connection (From New 24" Force Main to Existing 24" Mission Force Main)	$30,000	$30,000
	1	LS	Force Main Appurtenances (AV, BO, etc.)	$750,000	$750,000
	24000	LF	Testing of Sewer Force Main	$5	$120,000
	575000	SF	Grind and Cap Pavement	$2	$1,150,000
	1	LS	Traffic Control	$720,000	$720,000
			SUBTOTAL		**$22,955,000**
			CONTINGENCY (20%)		**$4,545,000**
			TOTAL		**$27,500,000**

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Assumptions:

1. Imported backfill has been assumed.
2. Assumed City of Oceanside will require a grind and cap over a width of two lanes (half the street).
3. Mobilization and Demobilization has been assumed at 5% of the cost.
4. Sheeting, Shoring and Trench Protection has been assumed at 2% of the cost.
5. Force Main Appurtenances have been assumed at 4% of the cost.
6. Night work has been assumed for the construction of the pipeline.

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Project: La Salina Lift Station and Plant Decommissioning

Sheet No. 1 of 1
Job No. 135-09369-15003
Computed by: KMB
Checked by: MWB Date: 7/12/17

EXHIBIT D
Preliminary - Order of Magnitude Probable Construction Costs
New Force Main from La Salina Lift Station to El Corazon Lift Station along Oceanside Boulevard
Alternative 3b

Item No.	Estimated Qty	Unit	Description	Unit Price	Total Price
	1	LS	Mobilization and Demobilization	$750,000	$750,000
	1	LS	Sheeting, Shoring and Trench Protection	$300,000	$300,000
	17650	LF	Construct 24" Sewer Force Main	$500	$8,825,000
	350	LF	Construct 42" Steel Casing (Bore and Jack) with 24" Carrier Pipe at Railroad Crossing	$3,600	$1,260,000
	1000	LF	Construct 42" Steel Casing (Microtunnel) with 24" Carrier Pipe at I-5 Freeway Crossing	$3,300	$3,300,000
	1	LS	Force Main Appurtenances (AV, BO, etc.)	$525,000	$525,000
	19000	LF	Testing of Sewer Force Main	$5	$95,000
	450000	SF	Grind and Cap Pavement	$2	$900,000
	1	LS	Traffic Control	$550,000	$550,000
			SUBTOTAL		**$16,505,000**
			CONTINGENCY (20%)		**$3,295,000**
			TOTAL		**$19,800,000**

This cost estimate is an estimate only. These figures are supplied as a guide only. This firm is not responsible for fluctuation in cost of material, labor, or components, or unforeseen contingencies.

Assumptions:

1. Imported backfill has been assumed.
2. Assumed City of Oceanside will require a grind and cap over a width of two lanes (half the street).
3. Mobilization and Demobilization has been assumed at 5% of the cost.
4. Sheeting, Shoring and Trench Protection has been assumed at 2% of the cost.
5. Force Main Appurtenances have been assumed at 4% of the pipeline cost.
6. Night work has been assumed for the construction of the pipeline.

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Client: City of Oceanside
Project: La Salina Lift Station and Plant Decommissioning

Sheet No. 1 of 1
Job No. 135-09369-15003
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EXHIBIT E
Preliminary - Order of Magnitude Probable Construction Costs
New Force Main from La Salina Lift Station to Buena Vista Pipeline along Oceanside Boulevard
Alternative 3c

Item No.	Estimated Qty	Unit	Description	Unit Price	Total Price
	1	LS	Mobilization and Demobilization	$740,000	$740,000
	1	LS	Sheeting, Shoring and Trench Protection	$295,000	$295,000
	15650	LF	Construct 24" Sewer Force Main	$500	$7,825,000
	350	LF	Construct 42" Steel Casing (Bore and Jack) with 24" Carrier Pipe at Railroad Crossing	$3,600	$1,260,000
	1000	LF	Construct 42" Steel Casing (Microtunnel) with 24" Carrier Pipe at I-5 Freeway Crossing	$3,300	$3,300,000
	1	LS	Force Main Appurtenances (AV, BO, etc.)	$500,000	$500,000
	1	LS	Valve Vault near Buena Vista Pipeline Interconnection	$500,000	$500,000
	17000	LF	Testing of Sewer Force Main	$5	$85,000
	410000	SF	Grind and Cap Pavement	$2	$820,000
	1	LS	Traffic Control	$525,000	$525,000
			SUBTOTAL		**$15,850,000**
			CONTINGENCY (20%)		**$3,150,000**
			TOTAL		**$19,000,000**

This cost estimate is an estimate only. These figures are supplied as a guide only. This firm is not responsible for fluctuation in cost of material, labor, or components, or unforeseen contingencies.

Assumptions:

1. Imported backfill has been assumed.
2. Assumed City of Oceanside will require a grind and cap over a width of two lanes (half the street).
3. Mobilization and Demobilization has been assumed at 5% of the cost.
4. Sheeting, Shoring and Trench Protection has been assumed at 2% of the cost.
5. Force Main Appurtenances have been assumed at 4% of the pipeline cost.
6. Night work has been assumed for the construction of the pipeline.

EXHIBIT F
Preliminary - Order of Magnitude Probable Construction Costs
El Corazon Lift Station

Item	Quantity	Unit Cost	Cost ($)
Mobilization/Demobilization	1 LS	75,000 LS	75,000
Earthwork and Grading	5,000 CY	15 $/CY	75,000
Site Paving	32,000 SF	6 $/SF	192,000
Site Fencing (Assumes Chain Link Fence)	1,400 LF	15 $/LF	21,000
Misc Site Work - drainage, lighting, etc	1 LS	25,000 LS	25,000
Site Piping	1 LS	50,000 LS	50,000
Load Equalization and Emergency Storage Tanks/Wet Well	1 LS	2,000,000 EA	2,000,000
Sewage Pumps	4 EA	225,000 LS	900,000
In-line Grinders	4 EA	75,000 LS	300,000
Pump Station Building (Assumes CMU Building)	1,400 SF	450 $/SF	630,000
Odor Control Equipment	1 LS	350,000 LS	350,000
Painting and Coatings	1 LS	70,000 LS	70,000
Electrical MCCs, VFD, Transformer, Conduit and Wiring	1 LS	1,200,000 LS	1,200,000
Instrumentation and Controls	1 LS	100,000 LS	100,000
Emergency Standby Generator	1 EA	600,000 EA	600,000
Subtotal			6,588,000
Contingencies @ 20%			1,317,600
Subtotal			7,905,600
Bonds and Insurance @ 2%			158,000
Contractors Overhead and Profit @ 15%			1,185,840
Total Estimated Construction Costs			**9,249,440**

Includes flows from La Salina, Oceanside Blvd and El Corazon = 9.2 MGD avg

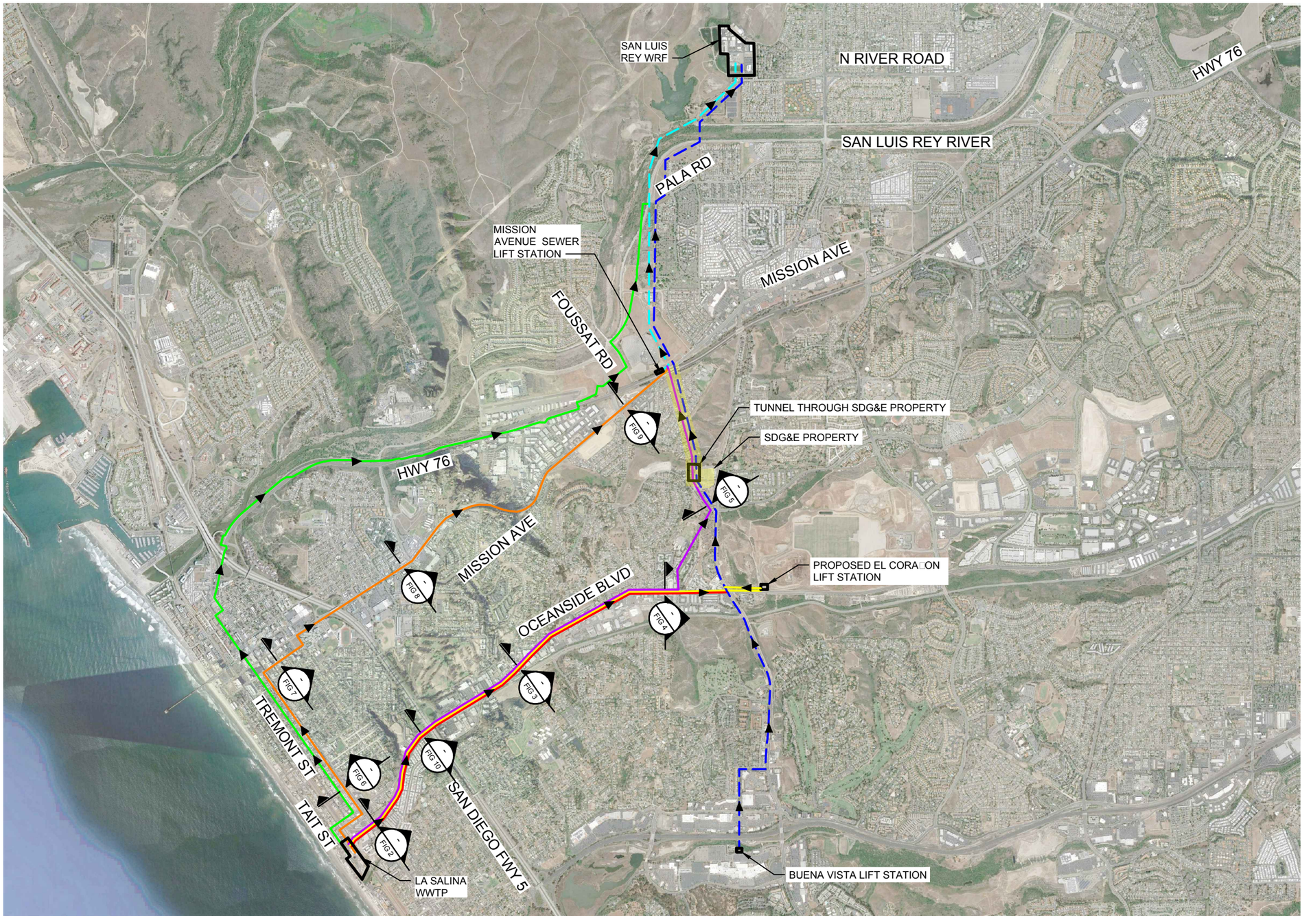
EXHIBIT G

Preliminary - Order of Magnitude Probable Construction Costs

Upgrades to Mission Lift Station

Item	Quantity	Unit Cost	Cost ($)
Mobilization/Demobilization	1 LS	140,000 LS	140,000
Modification to Sewage Pumps	4 EA	225,000 LS	900,000
Electrical MCCs, VFD, Transformer, Conduit and Wiring	1 LS	1,200,000 LS	1,200,000
Instrumentation and Controls	1 LS	100,000 LS	100,000
Emergency Standby Generator	1 EA	600,000 EA	600,000
Subtotal			2,940,000
Contingencies @ 20%			588,000
Subtotal			3,528,000
Bonds and Insurance @ 2%			71,000
Contractors Overhead and Profit @ 15%			529,200
Total Estimated Construction Costs			**4,128,200**

FIGURES



LEGEND:

- EXISTING BUENA VISTA FORCE MAIN
- EXISTING 24" MISSION LIFT STATION FORCE MAIN
- ALT 1 - HWY 76 TO MISSION FORCE MAIN
- ALT 2 - MISSION AVE TO MISSION FORCE MAIN
- ALT 3A - OCEANSIDE BLVD TO MISSION FORCE MAIN
- ALT 3B - OCEANSIDE BLVD TO EL CORA□ON LIFT STATION
- ALT 3C - OCEANSIDE BLVD TO BUENA VISTA PIPELINE

1 / FIG 1 — SECTION NUMBER / FIGURE NUMBER

N

0 1600' 3200'

SCALE: 1" = 3200'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

FORCE MAIN STUDY
SITE PLAN

Project No.:	135-09369-15003
Date:	JULY 2017
Designed By:	MBL
Figure	1

Bar Measures 1 inch

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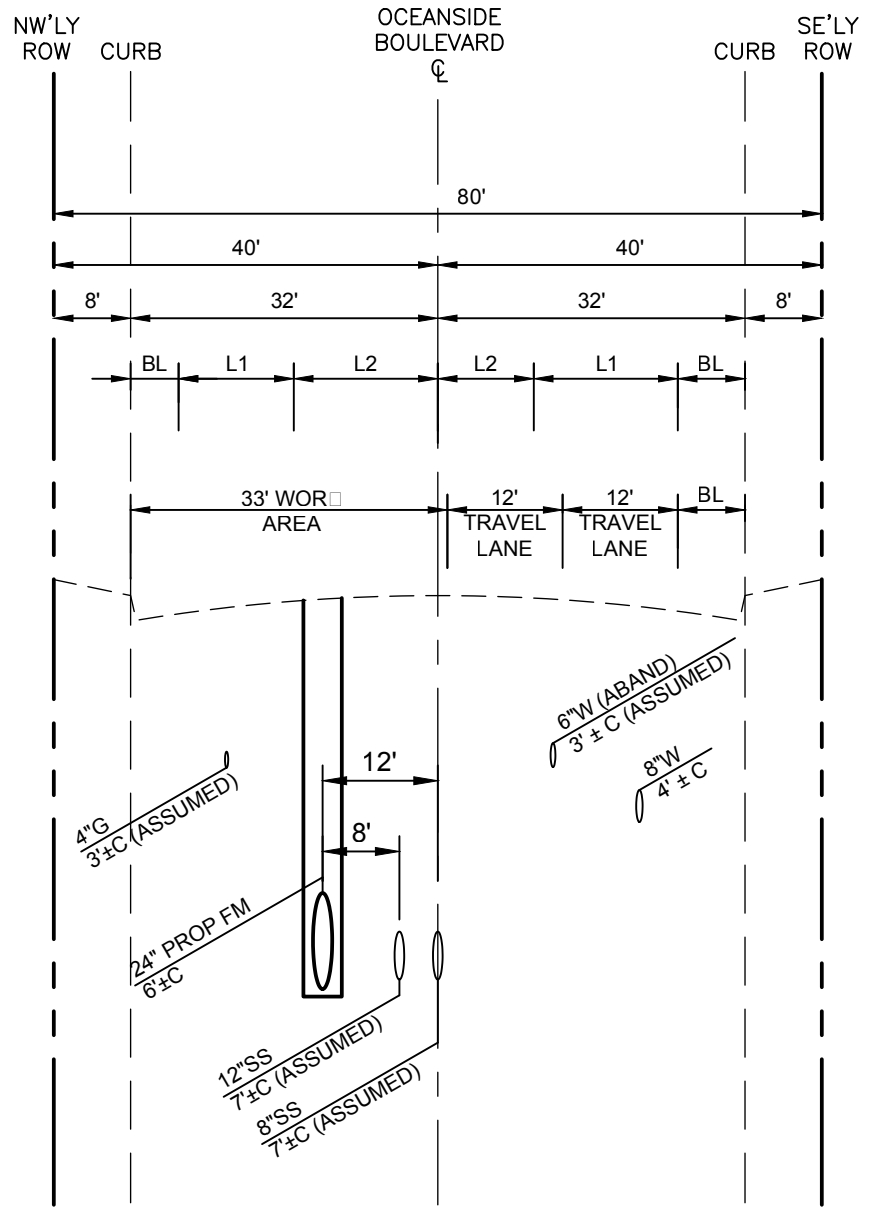

SECTION

LOO□ING NORTH-EAST

0 10' 20'

SCALE: HORI□ 1" = 20'
VERT 1" = 4'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

TYPICAL SECTION
OCEANSIDE BOULEVARD
BETWEEN SOUTH COAST HWY AND DITMAR ST

Project No.:	135-09369-15003
Date:	JULY 2017
Designed By:	MBL
FIGURE	2

Bar Measures 1 inch

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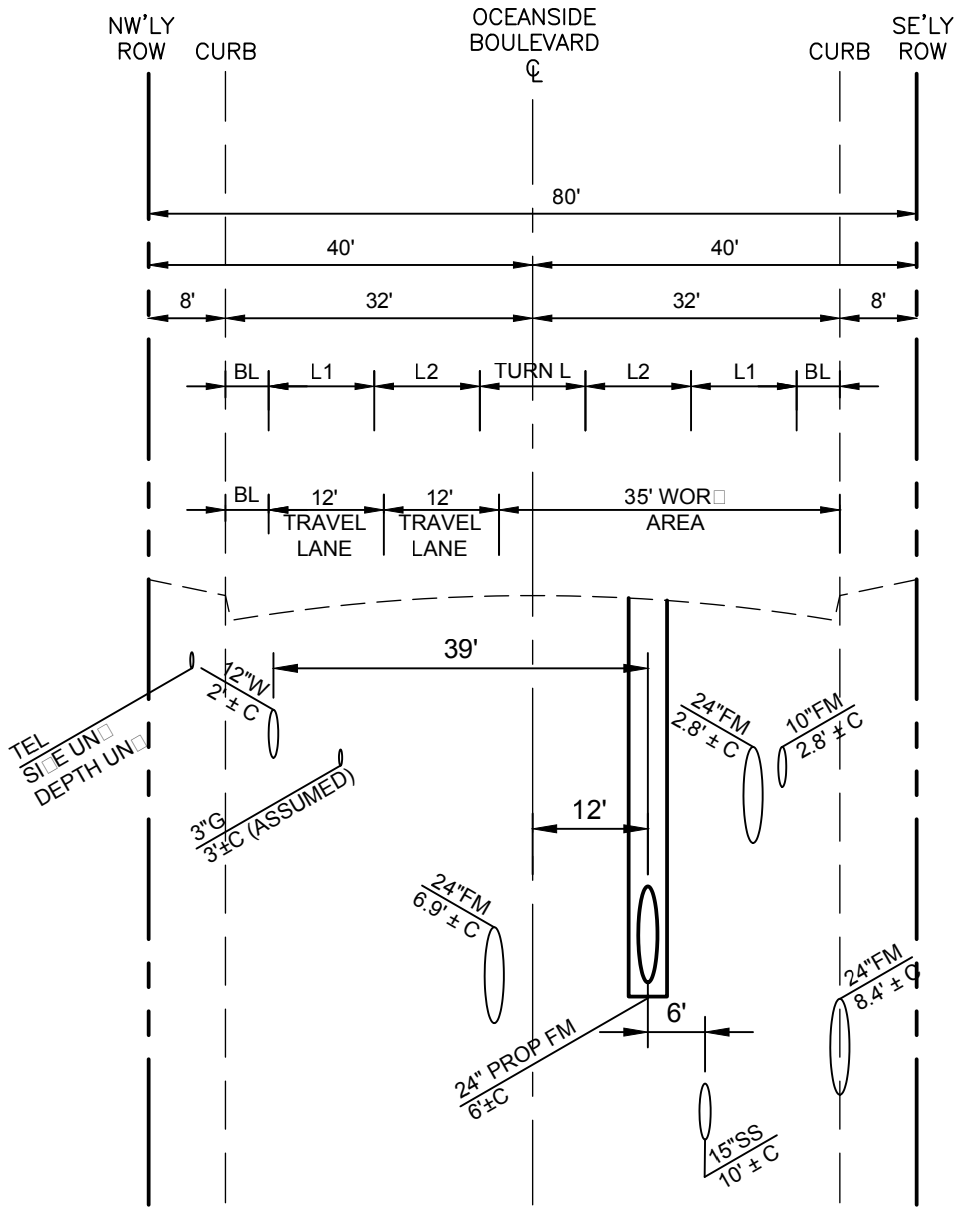

SECTION

LOO□ING NORTH-EAST

0 10' 20'

SCALE: HORI□ 1" = 20'
VERT 1" = 4'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

TYPICAL SECTION
OCEANSIDE BOULEVARD
BETWEEN CROUCH ST AND CANYON DR

Project No.:	135-09369-15003
Date:	JULY 2017
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FIGURE	3

Bar Measures 1 inch

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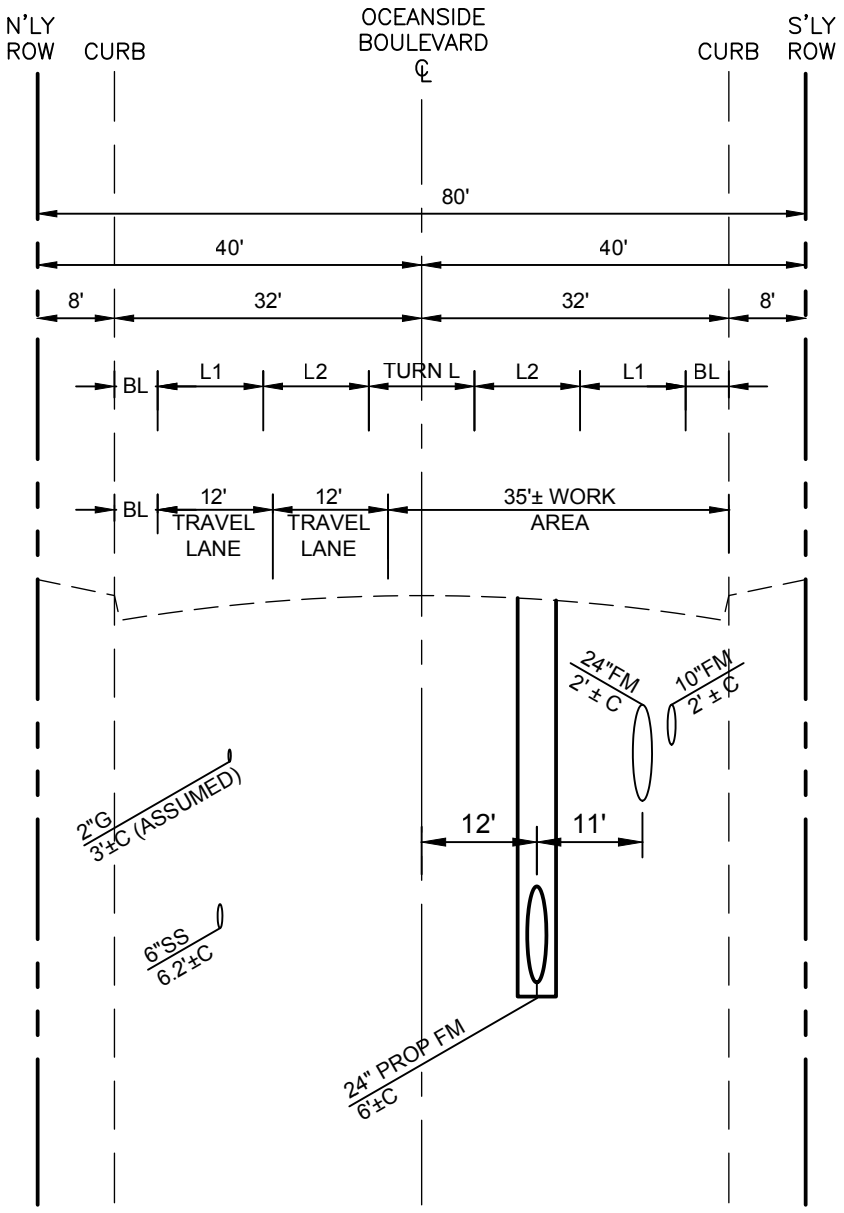

SECTION

LOO□ING EAST

0 10' 20'

SCALE: HORI□ 1" = 20'
VERT 1" = 4'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

TYPICAL SECTION
OCEANSIDE BOULEVARD
BETWEEN FOUSSAT RD AND EDGEHILL LN

Project No.:	135-09369-15003
Date:	JULY 2017
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FIGURE	4

Bar Measures 1 inch

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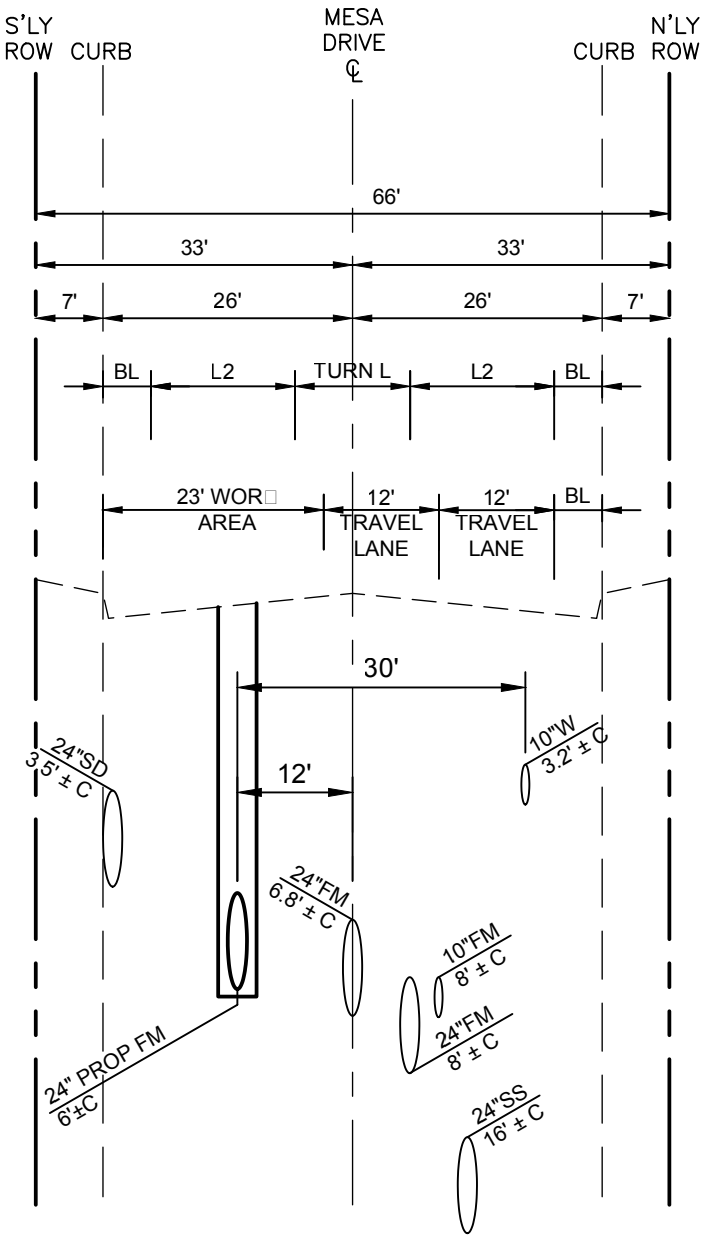

SECTION

LOO□ING WEST

0 10' 20'

SCALE: HORI□ 1" = 20'
VERT 1" = 4'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

TYPICAL SECTION
MESA DRIVE
□300' W/O INTERSECTION OF EL CAMINO REAL

Project No.:	135-09369-15003
Date:	JULY 2017
Designed By:	MBL
FIGURE	5

Bar Measures 1 inch

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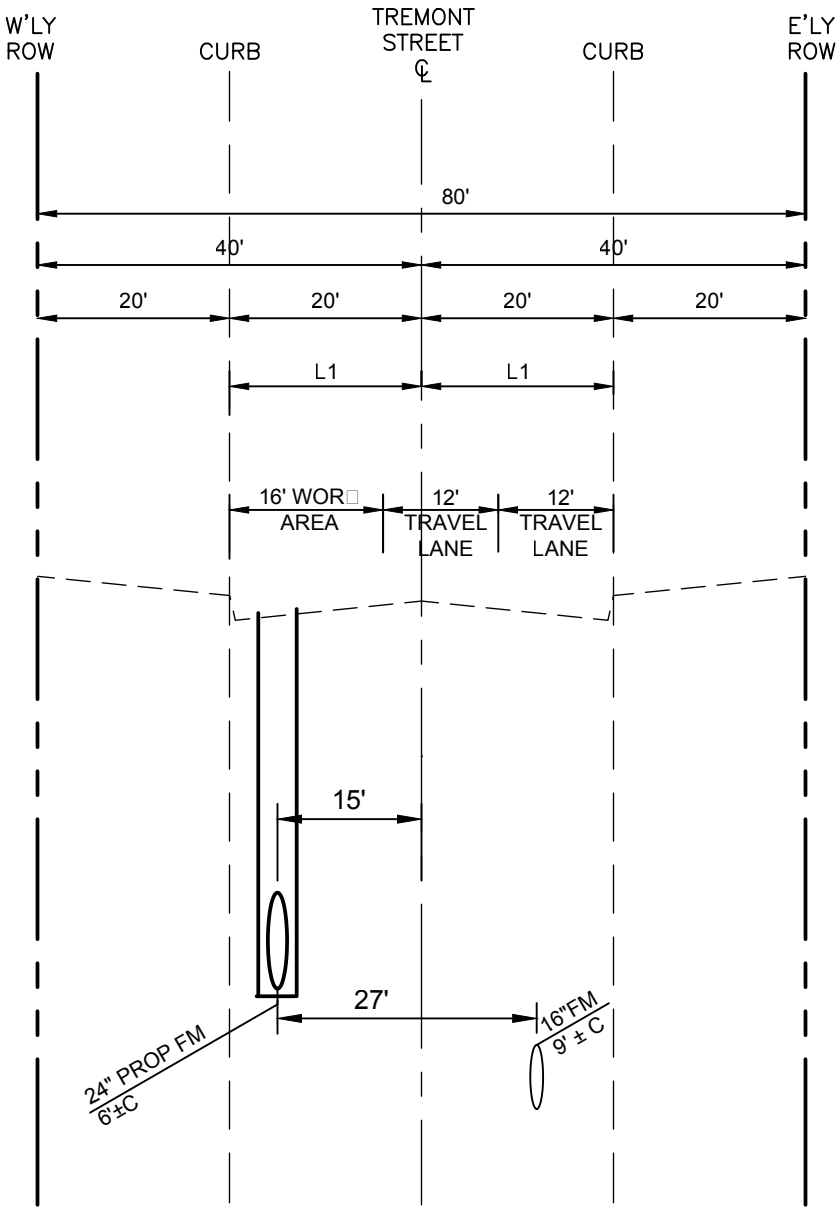

SECTION

LOO□ING NORTH

0 10' 20'

SCALE: HORI□ 1" = 20'
VERT 1" = 4'

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TYPICAL SECTION
TREMONT STREET
BETWEEN EUCALYPTUS ST AND OCEANSIDE BLVD

Project No.:	135-09369-15003
Date:	JULY 2017
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FIGURE	6

Bar Measures 1 inch

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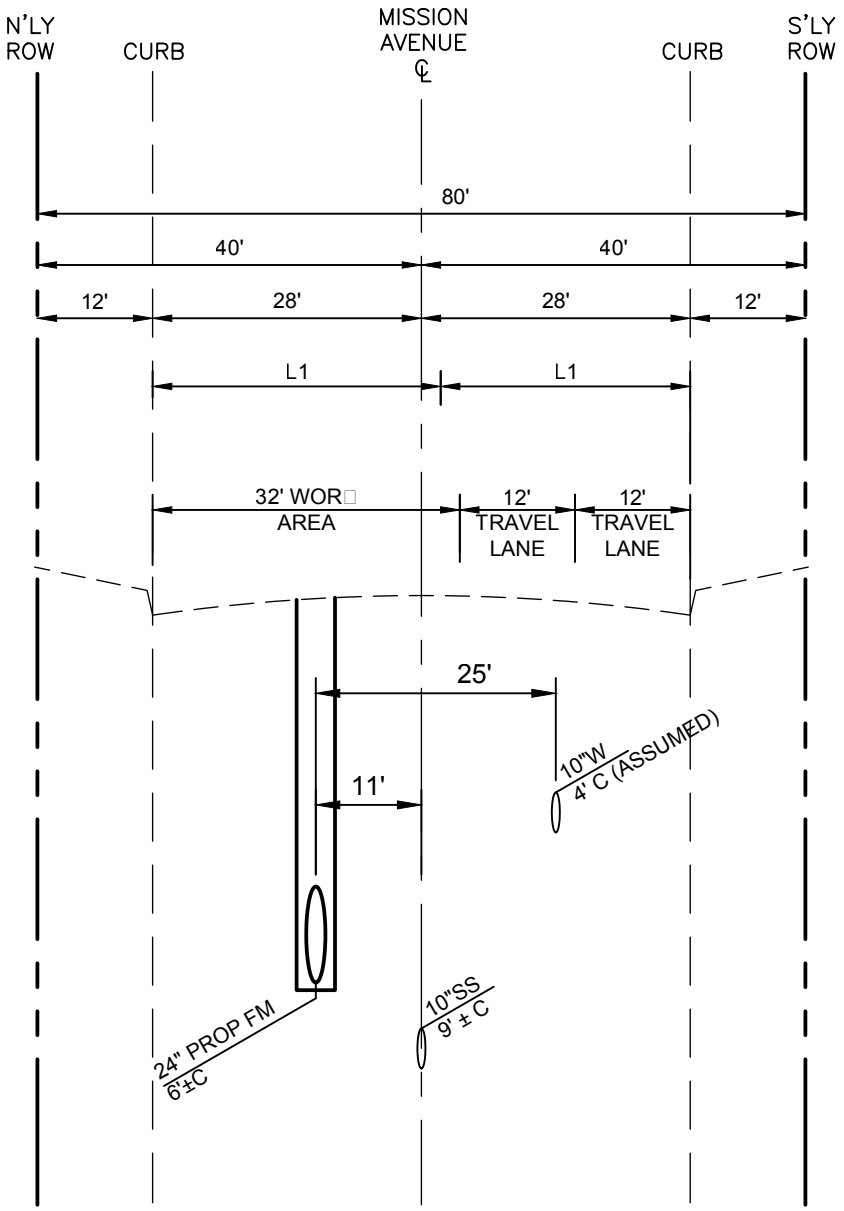

SECTION

LOO□ING EAST

0 10' 20'

SCALE: HORI□ 1" = 20'
VERT 1" = 4'

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LA SALINA LIFT STATION & PLANT DECOMMISSIONING

TYPICAL SECTION
SEAGA□E DRIVE
BETWEEN TREMONT ST AND SOUTH COAST HWY

Project No.:	135-09369-15003
Date:	JULY 2017
Designed By:	MBL
FIGURE	7

Bar Measures 1 inch

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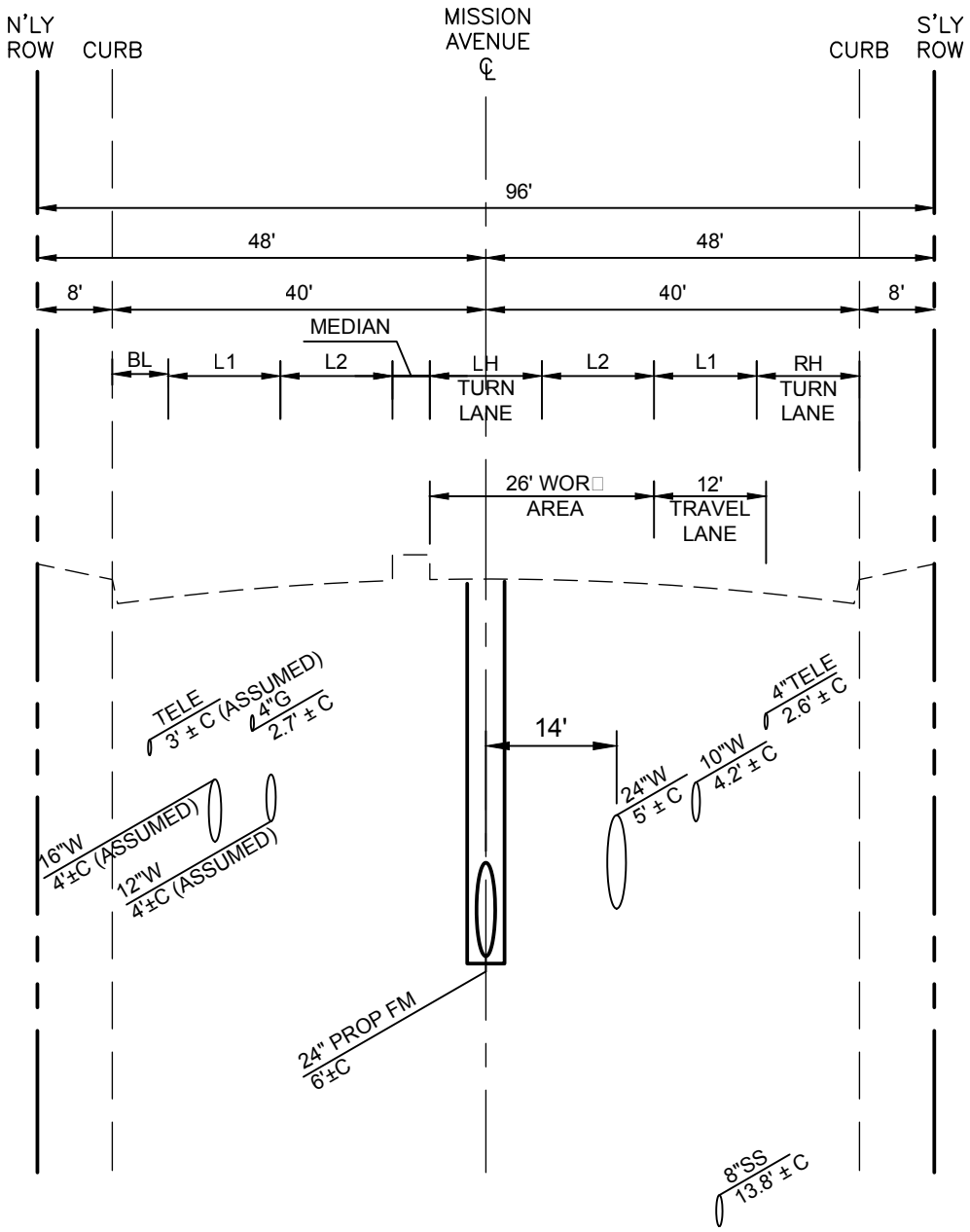

SECTION

LOO□ING EAST

0 10' 20'

SCALE: HORI□ 1" = 20'
VERT 1" = 4'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

TYPICAL SECTION
MISSION AVENUE
BETWEEN CANYON DR AND ARCHER ST

Project No.:	135-09369-15003
Date:	JULY 2017
Designed By:	MBL
FIGURE	8

Bar Measures 1 inch

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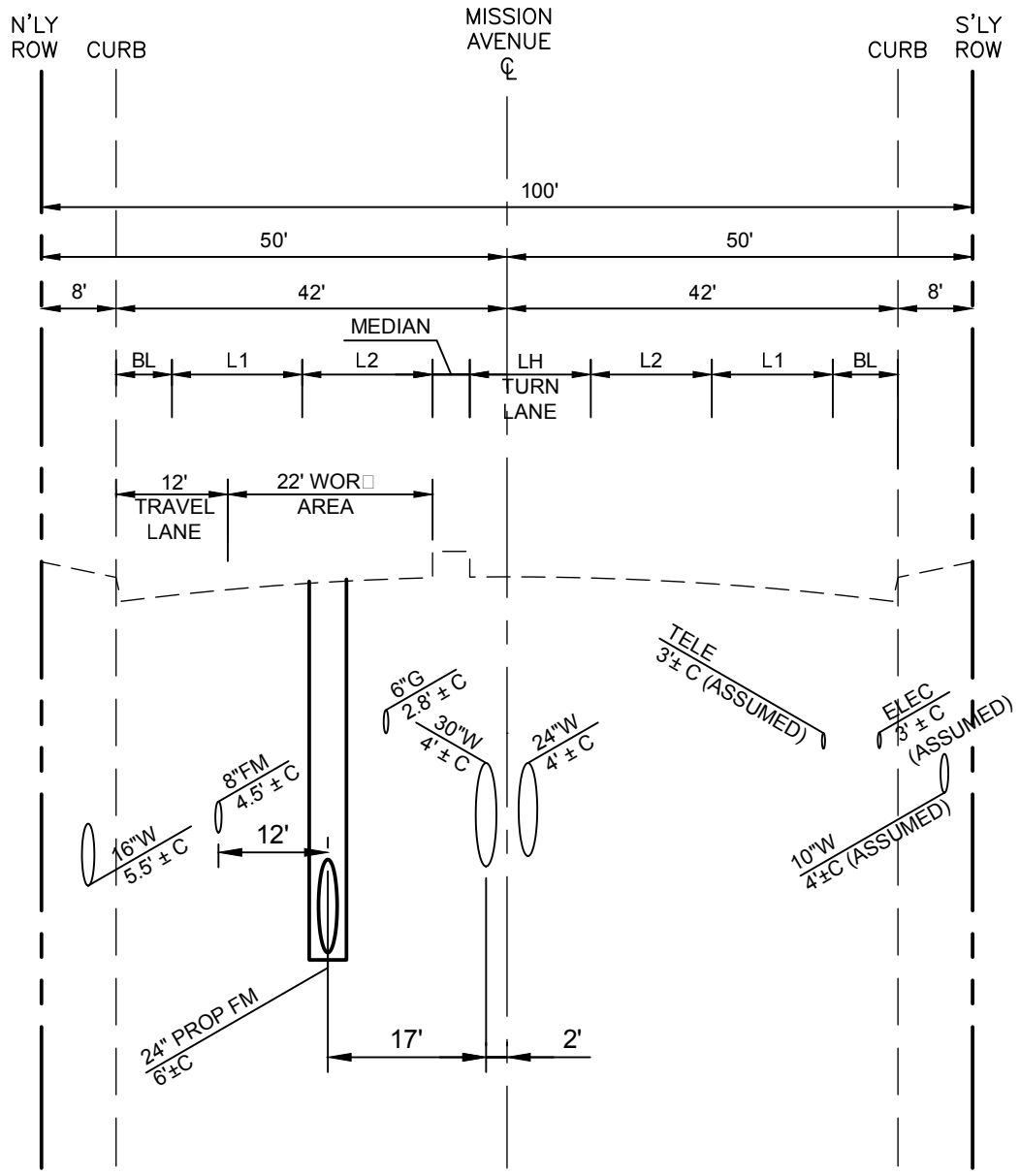

SECTION

LOO□ING EAST

0 10' 20'

SCALE: HORI□ 1" = 20'
VERT 1" = 4'

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TYPICAL SECTION
MISSION AVENUE
BETWEEN ROYMAR RD AND FOUSSAT RD

Project No.:	135-09369-15003
Date:	JULY 2017
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FIGURE	9

Bar Measures 1 inch

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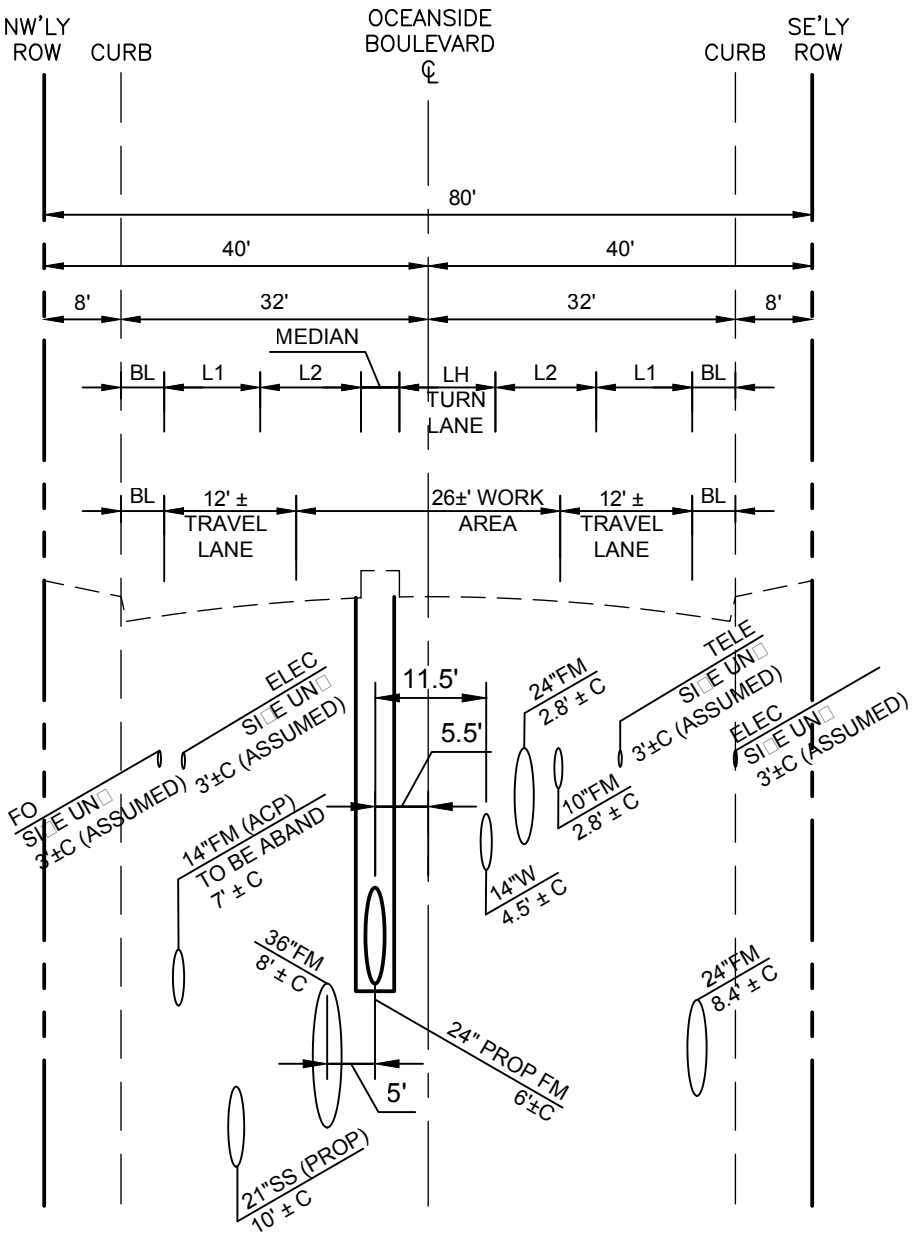

SECTION

LOO□ING NORTH-EAST

0 10' 20'

SCALE: HORI□ 1" = 20'

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

TYPICAL SECTION
OCEANSIDE BOULEVARD
□ 100' SE/O Vine Street

Project No.:	135-09369-15003
Date:	JULY 2017
Designed By:	MBL
FIGURE	10

Bar Measures 1 inch

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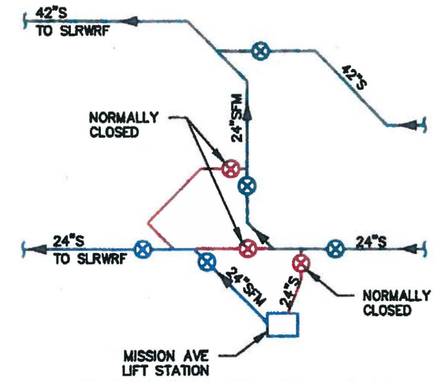
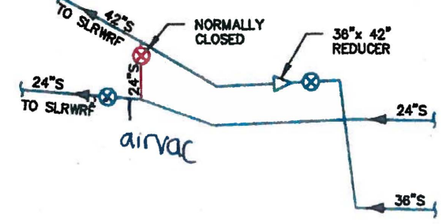
PROPOSED TIE-IN TO MISSION FORCE MAIN

MISSION AVE
EL CAMINO REAL
SR 76
FLOW FROM 24"GRAVITY LINE IS DIVERTED TO 42" GRAVITY LINE
SEE DETAIL A
HACIENDA AVE
LAS VEGAS DR
42" GRAVITY
24" GRAVITY
42" GRAVITY
24" FM
TO SLRWRF
TO SLRWRF
MISSION AVE LIFT STATION
FRONTIER DR
FOUSSAT RD
MISSION AVE
MAR LADO LIFT STATION
CROSS OVER SEE DETAIL B
END 36" FM
GENERAL LOCATION OF UTILITY TUNNEL
24" GRAVITY
36" FM
42" FM
BEGIN 36" FM
GENERAL LOCATION OF AIR RELEASE STRUCTURE
TONAPAH ST
MESA DR
24" GRAVITY
TOWNE CENTER DR
MESA DR
EL CAMINO REAL
30" FM
24" GRAVITY
42" GRAVITY
FROM BUENA VISTA LIFT STATION
24" FM
8" PIPELINE
GARRISON ST
OCEANSIDE BLVD
INDUSTRY ST
ALT 2
ALT 3A
TO LA SALINA WWTP



DETAIL 'A'



DETAIL 'B'

GRAPHIC SCALE
0 800'
SCALE: 1" = 800'

SITE PLAN
SCALE: 1"=800'

SUB-SYSTEMS
- BUENA VISTA LIFT STATION & MESA/GARRISON GRAVITY
- MISSION AVE LIFT STATION
- NOT USED/STAND-BY
- ALT 2 (MISSION AVE TO MISSION FORCE MAIN)
- ALT 3A (OCEANSIDE BLVD TO MISSION FORCE MAIN)

FIGURE 11
ALTERNATIVE 2 AND 3A
TIE-IN LOCATION
SITE PLAN

4/10/2014 1:37:03 PM P:\101.Engineering\Oceanside\7856 OdorControl&ChemEval\06-Design\CAD 7856\7856 FIGURE TRUNK SEWER

Proposed El Corazon Lift Station

24" GRAVITY

TOWNE CENTER DR

FROM BUENA VISTA LIFT STATION

Pumped Flows into Buena Vista Pipeline

MESA DR

EL CAMINO REAL

MISSION AVE

SR 76

EL CAMINO REAL

30" FM

24" FM

24" GRAVITY

42" GRAVITY

8" PIPELINE

GARRISON ST

OCEANSIDE BLVD

INDUSTRY ST

FLOW FROM 24"GRAVITY LINE IS DIVERTED TO 42" GRAVITY LINE

CROSS OVER SEE DETAIL B

END 36" FM

GENERAL LOCATION OF UTILITY TUNNEL

LAS VEGAS DR

HACIENDA AVE

24" GRAVITY
36" FM

42" FM

BEGIN 36" FM

SEE DETAIL A

42" GRAVITY
24" GRAVITY

GENERAL LOCATION OF AIR RELEASE STRUCTURE

42" GRAVITY
24" FM

TO SLRWRF

TO SLRWRF

MISSION AVE LIFT STATION

FRONTIER DR

TONAPAH ST

MESA DR

FOUSSAT RD

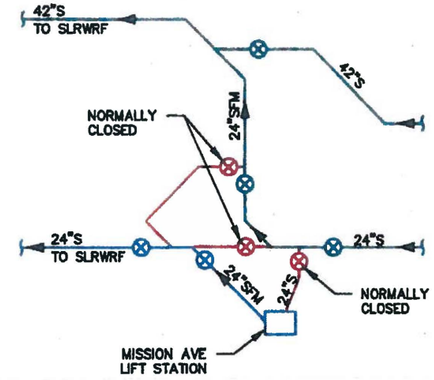
MISSION AVE

MAR LADO LIFT STATION

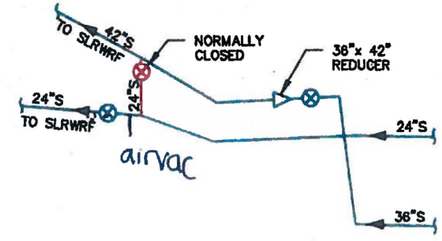
ALT 3B

TO LA SALINA WWTP

PROPOSED TIE-IN TO BUENA VISTA PIPELINE



DETAIL 'A'



DETAIL 'B'

GRAPHIC SCALE
0 800'
SCALE: 1" = 800'

SITE PLAN
SCALE: 1"=800'

SUB-SYSTEMS
- BUENA VISTA LIFT STATION & MESA/GARRISON GRAVITY
- MISSION AVE LIFT STATION
- NOT USED/STAND-BY
- ALT 3B (OCEANSIDE BLVD. TO EL CORAZON LIFT STATION)

FIGURE 12
ALTERNATIVE 3B
TIE-IN LOCATION
SITE PLAN

4/10/2014 1:37:03 PM P:\101.Engineering\Oceanside\7856 OdorControl&ChemEval\06-Design\CAD 7856\7856 F

RE-ALIGN APPROX 3000 LF OF OCEANSIDE BLVD SEWER

RE-ALIGN APPROX 1200 LF OF MESA DRIVE SEWER

24" GRAVITY

MISSION AVE

EL CAMINO REAL

SR 76

TOWNE CENTER DR

MESA DR

EL CAMINO REAL

30" FM

24" GRAVITY

42" GRAVITY

FROM BUENA VISTA LIFT STATION

24" FM

OCEANSIDE BLVD

INDUSTRY ST

8" PIPELINE

GARRISON ST

FLOW FROM 24"GRAVITY LINE IS DIVERTED TO 42" GRAVITY LINE

CROSS OVER SEE DETAIL B

END 36" FM

GENERAL LOCATION OF UTILITY TUNNEL

24" GRAVITY

36" FM

42" FM

BEGIN 36" FM

LAS VEGAS DR

HACIENDA AVE

SEE DETAIL A

42" GRAVITY

24" GRAVITY

GENERAL LOCATION OF AIR RELEASE STRUCTURE

TONOPAH ST

TO SLRWRF

42" GRAVITY

24" FM

TO SLRWRF

MISSION AVE LIFT STATION

FRONTIER DR

MESA DR

FOUSSAT RD

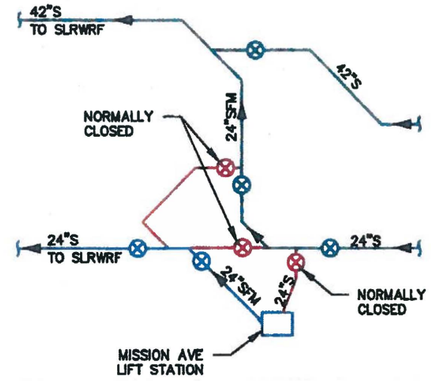
MISSION AVE

MAR LADO LIFT STATION

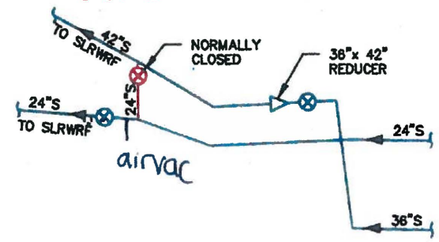
ALT 3C

TO LA SALINA WWTP

PROPOSED TIE-IN TO BUENA VISTA PIPELINE



DETAIL 'A'



DETAIL 'B'

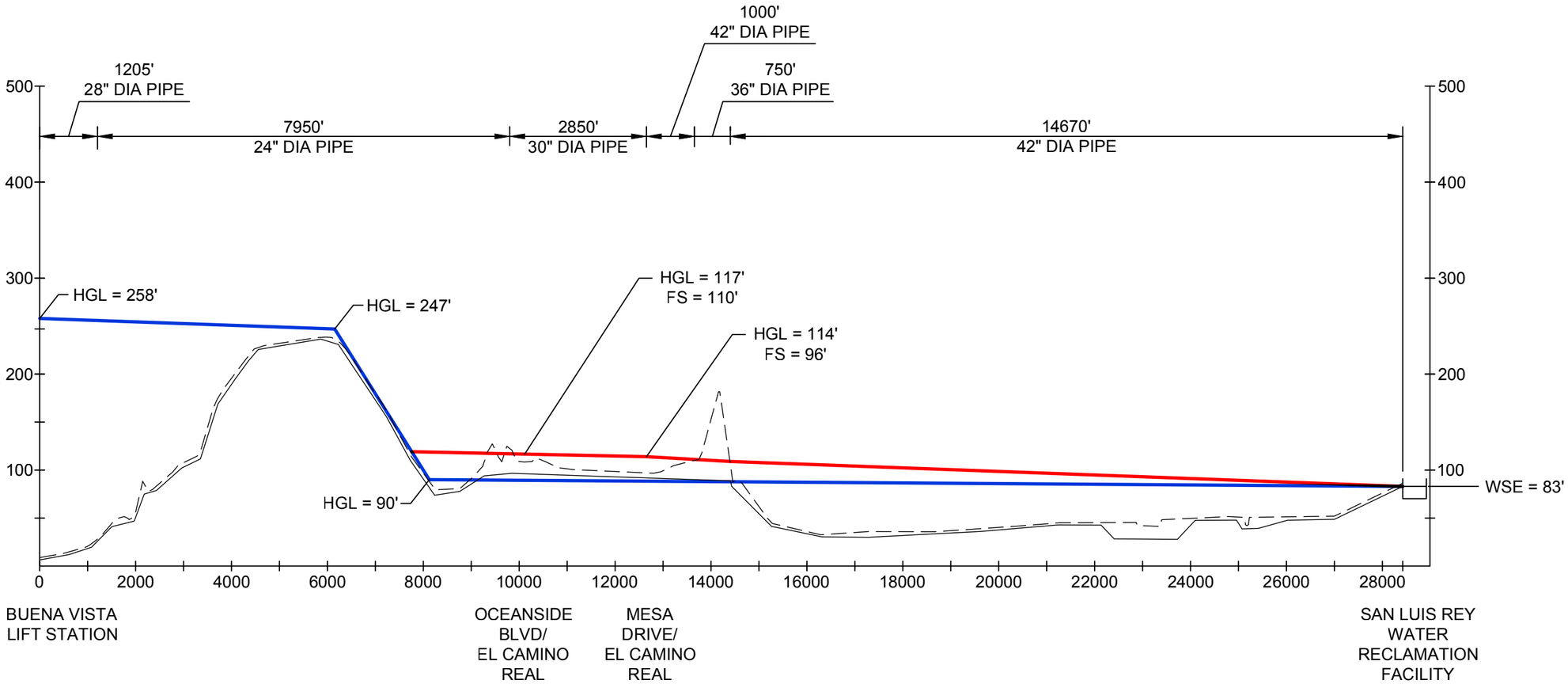
GRAPHIC SCALE
0 800'
SCALE: 1" = 800'

SITE PLAN
SCALE: 1"=800'

SUB-SYSTEMS
- BUENA VISTA LIFT STATION & MESA/GARRISON GRAVITY
- MISSION AVE LIFT STATION
- NOT USED/STAND-BY
- (ALT 3C OCEANSIDE BLVD TO BUENA VISTA PIPELINE)

FIGURE 13
ALTERNATIVE 3C
TIE-IN LOCATION
SITE PLAN

4/10/2014 1:37:03 PM P:\101.Engineering\Oceanside\7856 OdorControl&ChemEval\06-Design\CAD 7856\7856 FIGURE TRUNK SEWER



LEGEND:

- HGL FOR BUENA VISTA LIFT STATION ONLY
- HGL FOR COMBINED FLOWS (BUENA VISTA, LA SALINA AND MESA DRIVE/OCEANSIDE BLVD GRAVITY)

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

BUENA VISTA PIPELINE HGL
FOR ALTERNATIVE 3C

Project No.:	135-09369-15003
Date:	JULY 2017
Designed By:	MBL
Figure	14

Bar Measures 1 inch

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La Salina Lift Station and Treatment Plant Decommissioning

Appendix G. Technical Memorandum - Odor Control

TETRA TECH

La Salina Pump Station Odor Control Design Technical Memorandum

Date: June 06 2016

To: City of Oceanside

From: Steve Ellis, Tetra Tech

Subject: La Salina Pump Station - Odor Control System Comparison

1.0 Background

Odor control will be required for the La Salina Pump Station. The new odor control facility would be sized to handle an estimated air flow of 7,800 cubic feet per minute (cfm) from the wetwell, equalization tank and emergency storage tank. This technical memorandum evaluates the use of wet scrubbers and carbon scrubber for odor control at the pump station; it addresses processes, site layout, removal efficiency, auxiliary equipment, operation and maintenance requirements, safety issues, and capital and life cycle costs.

1.1 Basis of Design

Table 1 provides the basis of design used to evaluate the odor control systems.

Table 1: La Salina Pump Station Odor Control Design Assumptions

	Assumption	Basis of Design
Air Flow	7,800 cfm	2 air changes/hour in emergency storage tank 6 air changes/hour in wetwell 6 air changes/hour in equalization tank (assume 50% full)
Hydrogen Sulfide	Average: 10 ppm Peak: 20 ppm	

The odor control goal for the La Salina Pump Station is to remove all nuisance odors and treat air to yield odor concentrations less than the odor threshold level and exposure limits. For this study, vapor phase treatment options were considered.

2.0 Low-Profile Wet Scrubber

2.1 Description

Wet scrubbing transfers odorous gases from an air stream by absorption and adsorption into a liquid stream (the scrubbing solution). Low profile units are small packaged wet scrubbers used

to treat odorous air volumes from 1,000 cfm to 20,000 cfm. Manufacturers of low profile units include US Filter/RJ Environmental and EraTech.

The principle of operation for low-profile systems is the same as for commonly used packed wet scrubbers. The low-profile system consists of a single vessel with three separate chambers. The scrubber vessel, fans, chemical metering pumps, and instrumentation are all skid-mounted. Sodium hydroxide solution (caustic) and sodium hypochlorite inside the chambers of the vessel are used to remove odors. Figure 1 illustrates a schematic of a typical low-profile wet scrubber system.

In Stage 1, the odorous gases are pre-treated with caustic to remove 70 to 80 percent of the incoming H_2S. The gas then passes through Stages 2 and 3, where a combination of sodium hypochlorite and caustic solution remove up to 99 percent of the remaining hydrogen sulfide. Packing media in the chambers increase the scrubbing efficiency by providing a surface area for contact between the odorous air and scrubbing solution. A mist eliminator is provided at the discharge of the system to remove 99 percent of mist particles in the exhaust air.

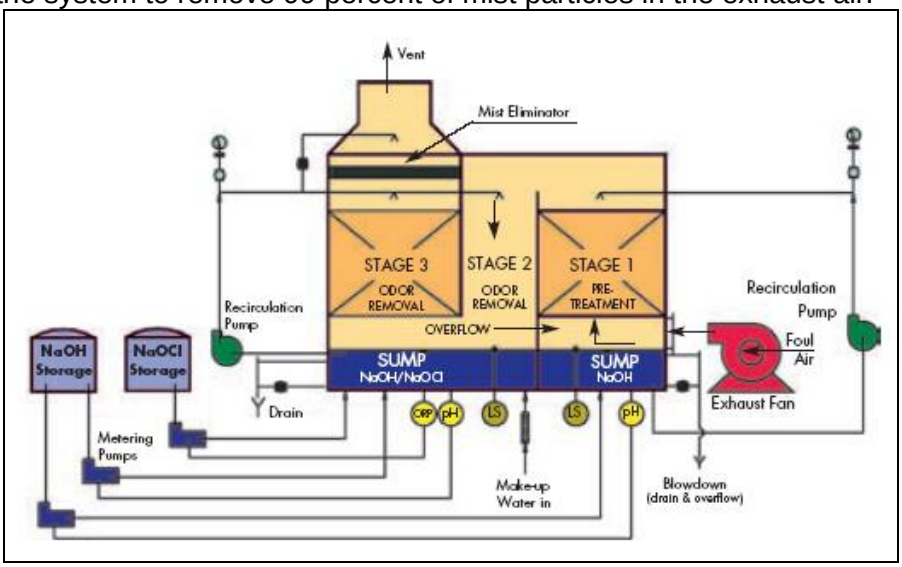


Figure 1. Typical Low-Profile Wet Scrubber System

The chemical solution is fed by chemical metering pumps into the sump at the bottom of the chambers. The chemical solutions are constantly recycled in the vessel via recirculation pumps. A small percentage of the chemical solution is continuously wasted to the sewer system during the process (blowdown) and replenished by makeup water. The blowdown removes waste products (salt byproducts) from the system. Drainage of the sump prevents solids accumulation.

2.2 Scrubber Design Criteria

The design criteria for low-profile wet scrubber system are summarized in Table 5.

Table 5: Low-Profile Wet Scrubber Design Criteria

Scrubbers	Low-profile wet scrubbers

Material	Fiberglass Reinforced Plastic (FRP)
Type of Media	Polypropylene
Life	20-25 years
Vessel Dimensions	11.25-feet long, 7 feet wide, 16 feet high
Air flow rate	1,600 feet per minute
Removal Efficiency	average H_2S loading - 98%; peak H_2S loading – 99.5%
Static Pressure	6 inches water column
Chemicals	Sodium Hydroxide and Sodium Hypochlorite (15 ft x 15 ft – chemical tank storage area)
Operation Pressure	Suction

2.3 Site Layout

The wet scrubber odor control system (vessel and fan) would occupy an approximate footprint area of 20 feet by 20 feet, with a height of 16 feet. Two recirculation pumps are located adjacent to the wet scrubber units. The exhaust fan would be located downstream of the wet scrubber units.

2.4 Chemicals

Caustic is used in the first stage of the wet scrubbers to lower the pH and keep the H_2S in solution. In the second stage, a mixture of caustic and sodium hypochlorite is used to oxidize the H_2S. A 15-by-15-foot chemical storage area adjacent to the odor control structure housing the wet scrubber would house the storage tanks for these chemicals. The chemicals would be stored in high-density polyethylene (HDPE) tanks, located either in a concrete structure partially below grade for containment (a minimum of 110 percent of required storage volume below grade) of raised higher with a containment sump provided at grade. A sump would be provided at the chemical storage area to drain chemicals. It is assumed that the fill station would be located at the chemical storage area because of the site access availability, although it could be located remotely if required due to limited access.

A 300-gallon and 700-gallon tank would be required for 30-day chemical storage of sodium hydroxide and sodium hypochlorite, respectively. It has experienced that a 25-percent solution of sodium hydroxide tends to crystallize at low temperatures. Therefore, a 20-percent solution is recommended, with heat tracing of exposed piping and sump heaters in the wet scrubbers. Table 6 outlines design criteria for the chemical storage area.

Table 6: Chemical Storage and Usage

	Stage 1 Sodium Hydroxide[b]	Stage 2 Sodium Hypochlorite[b]	Stage 2 Sodium Hydroxide[b]
Chemical Storage, gal[a]	300	700	200
Peak chemical use, gal/hr[c]	0.73	1.88	0.31

Avg. chemical use, gal/hr	0.37	0.94	0.16
a. Assumes monthly delivery frequency b. Assumes sodium hydroxide @ 20% and sodium hypochlorite @ 12.5% c. Metering pumps will be sized to handle peak chemical demand			

2.5 Ancillary Equipment

2.5.1 Recirculation Pumps

Each sump would have a vertical centrifugal type pump to recirculate the sump solution and distribute it over the plastic media. The recirculation pump in Stage 1 would distribute the sodium hydroxide at a rate of 190 gallons per minute (gpm). The pump in Stages 2 and 3 would distribute the combination of sodium hydroxide and sodium hypochlorite at a rate of 190 gpm.

2.5.2 Make-Up Water

The chemical reactions in the system create sodium sulfate and sodium chloride. The salt byproducts are removed from the process using make-up water continuously added to the sump of Stages 2 and 3 and controlled via a flow meter and gate valve. The salt byproducts dissolve in the sump liquid overflow from the sump at the same rate that the make-up water is injected. Make-up water into the sump would be required at a rate of 5 gpm at 25 psig.

Make-up water can be either fresh water or reclaimed water. Water softening is often required to reduce the hardness in the make-up water (either fresh water or reclaimed water). If the make-up water is likely to contain particulates, a filter is recommended to keep the particulates from entering the sump. A filter is likely not required because the reclaimed water will have been treated in a membrane bioreactor process, and have gone through a filtration process.

2.5.3 Instrumentation Controls

Controllers would control the injection rate of chemicals by the metering pumps, in order to maintain the system pH and oxygen reduction potential (ORP) at the optimum settings. By connecting chemical metering pumps to pH and ORP probes, the chemical dosage can be varied to meet fluctuations in the incoming odor concentrations. An alarm in each sump would warn when the sump levels are low. A pressure differential gauge would ensure that the media does not become plugged.

2.6 Operations and Maintenance

Wet scrubbers have high operation and maintenance requirements. Periodic monitoring of the low-profile wet scrubbers would be required to ensure proper operation of the system. During normal operation, it is recommended that wet scrubbers be inspected daily. Periodic maintenance tasks would include inspecting equipment and piping for leaks, replacing worn parts on pumps, and cleaning nozzles prone to plugging.

The wet scrubber system would require daily monitoring of instrumentation such as pressure gauges and scrubber flow meters. Operator time would be required to monitor the complex

chemical feed system. The chemical storage tank levels, pH levels and alarm indicator lights would be routinely monitored. If a water softener system and filter are required, monitoring of the salt supply in the water softener system and maintenance on the filter to prevent plugging would be needed. Testing the water supply from the softener for hardness would be required monthly to ensure proper operation. Most likely, readings from the instrumentation associated with the wet scrubbers would be performed remotely at the treatment plant influent pump station.

Continuous maintenance would be required to minimize failures due to abrasion, corrosion, solids buildup and wear of rotating parts. Nozzle plugging, one of the most common malfunctions, can be detected by observing the liquid spray pattern and an increase in the inlet pressure to the scrubber. Solids buildup resulting from chemical scaling can lead to plugging of pipes and ducts. Recirculation and metering pumps must be maintained to minimize pump wear.

Access manholes are provided for maintenance of the nozzles and synthetic media in each chamber. The media requires replacing every 20 to 25 years. For this analysis, a 20-year life was assumed for the synthetic media.

Chemicals used by the wet scrubbers require proper monitoring and handling to ensure personnel safety and a safe surrounding environment. Sodium hydroxide has been used throughout the region for immediate and intermittent odor problems. The chemical is odorless but very corrosive due to its high pH. Proper precautions have been established and followed for transporting and handling this product. Sodium hypochlorite has been used in packed bed scrubbers at various municipal facilities. Sodium hypochlorite is a very stable compound with a slight chlorine smell.

3.0 Carbon Scrubbers

3.1 Description

Carbon vessels are filled with pelletized activated carbon to remove hydrogen sulfide and organic odors. To minimize the equipment footprint while maintaining the recommended 50-fpm face velocity, a 10-foot diameter horizontal FRP vessel with two vertical carbon beds is recommended. Three-foot-thick beds will provide the recommended 3-4 seconds empty bed contact time (EBCT). This equipment will provide a carbon life of 1 years based on the assumed hydrogen sulfide loading, air quantities, concentrations, and equipment efficiencies stated previously. Three carbon sample ports, and a grounding rod will be included for each bed. Drains and overflows also will be required for the vessel. The pressure drop across the vessel will be monitored using a manometer to indicate carbon life.

Carbon will be evacuated and loaded from the driveway, using a vacuum truck and boom truck. A driveway will need to provide sufficient room for the trucks to back in and extend their support outriggers. The carbon beds will be accessed via hatches on the top of the vessel that operators can reach from the FRP grating above the units. The hatch should cover the bed completely and rise above the top of the vessel.

To avoid short-circuiting of the foul air due to carbon settling, the carbon should be filled above the circular portion of the vessel and tamped down from outside the vessel during the filling process. Modifications to the vessel to allow for greater accessibility during this tamping process, or to eliminate the need for it, should be considered during final design. The carbon replacement process is assumed to be performed by plant personnel; however, it would be possible to outsource this work.

3.2 Design Criteria

The design criteria for the carbon scrubber system are summarized in Table 7.

Table 7: Carbon Scrubber Design Criteria

Filter Towers	Carbon Scrubbers
Material	Fiberglass Reinforced Plastic (FRP)
Type of Media	Pelletized Activated Carbon
Life	1 years
Contact Time (empty bed)	3.6 seconds
Removal Efficiency	Varies; based on contact time and inlet H_2S concentration

3.3 Site Layout

The carbon scrubber odor control system would occupy an approximate footprint area of 25 feet by 30 feet, with a height of 18 feet assuming the vessel is above grade with grating and handrails on top for access to hatches. Site layout options also include placing the carbon vessel below grade in a concrete vault, but would have to be further evaluated based on soil conditions. This would result in lowering the height down to approximately 10 feet (dictated by the exhaust fan).

3.4 Ancillary Equipment

3.4.1 Mist Eliminator

The primary means of moisture removal prior to the carbon scrubber will be the chevron-type mist eliminators located prior to the carbon scrubber. This prevents the carryover of grease to the media susceptible to fouling and reducing treatment efficiency.

4.0 Cost Analysis

A cost analysis was prepared for the odor control systems evaluated. The costs were developed in three areas: equipment and installation costs, annual operations and maintenance (O&M) costs, and 20-year life cycle operation and maintenance costs (present worth O&M). Table 8

presents the cost estimates for the odor control systems. Capital and O&M costs associated with modifications to the carbon scrubber are not included in the analysis. The equipment and installation costs include the odor control systems, backup pumping equipment, and ancillary equipment. It was assumed that cost for ducting, electrical, controls, and other costs such as contractor markups would be similar for each alternative, so these items were left out of the comparison.

Table 8: Cost Estimate

	Wet Scrubber	Carbon Scrubber
Equipment and Installation	$ 260,000	$160,000
Annual O&M	$36,000	$71,700

Annual O&M costs include all the consumables (chemicals, media), power, and labor needed to operate and maintain the odor control systems. Assumptions include the following:

- Power = $0.07 kWh
- Labor = $35/ hr
- Sodium hypochlorite = $0.60/gallon
- Sodium hydroxide = $1.00/gallon
- Annual maintenance services = 3% of equipment costs
- $ 3/lbs (carbon scrubber)

Life cycle costs are the annual costs calculated over a 20-year period. The costs are presented as a present worth value, or the equivalent value of 20 years of operations costs in today's dollars. A discount rate of 3% was used resulting in a present worth factor of 14.9.

5.0 Evaluation

Table 9 provides a summary of the qualitative and quantitative differences between the odor control scrubber systems.

Table 9: Comparison Summary Table

	Wet Scrubber	Carbon Scrubber
Approximate Footprint Area, ft^2	20 x 20 (wetscrubber + fan) 15 x 15 (chemical storage)	25 x 30 (vessel, fan, mist eliminator)
Equipment Height/Depth[a], ft	16	18 10 (if vessel below grade)
Chemicals Required	Yes	No
Safety Hazards	Yes	No

Pumps required	2 recirculation	No
Power Usage, kW-h/year	232,900	197,100
Equipment and Installation Cost	$260,000	$160,000
Annual O&M Cost	$36,000	$71,000
a. Equipment height only, does not include piping bends from equipment outlet flange.		

The carbon scrubber system's higher O&M cost associated with its costly and frequent media replacement. The wet scrubbers have a higher power due to the operation of two recirculation pumps. Sodium hydroxide tends to crystallize at normal operating temperatures and can cause additional maintenance problems by crystallizing within the nozzles, pumps and ductwork. The wetscrubbers provide a higher level of treatment to handle additional nuisance odors other than hydrogen sulfide. The chemicals automatically adjust to reliability meet the effluent levels.

Non-monetary benefits of carbon scrubbers include environmental health and safety and decreased liability associated with the storage and handling of corrosive chemicals. Carbon scrubbers do not require the use of chemicals that pose a risk to the public in case of their accidental release, as wet scrubbers do. Carbon scrubbers however, result in the higher O&M costs related to higher power usage and the carbon removal costs.

6.0 Recommendation

A wet scrubber system is the recommended approach based on cost and reliability. However, a construction cost estimate is recommended. The wet scrubber would be located along the fenceline, east of the lift station. The odor control system would treat air flows from the wetwell, equalization tank and emergency storage tank.

La Salina Lift Station and Treatment Plant Decommissioning

Appendix H. Technical Memorandum - Stormwater UV Facility Relocation

TETRA TECH

DRAFT

Memorandum

Date:	November 11, 2016
To:	Shawnele Morelos, P.E., City of Oceanside
Cc:	
From:	Steve Ellis, P.E., Tetra Tech
Project:	La Salina Lift Station and Plant Decommissioning ***Project Number:*** 135-09369-15003
Subject:	Evaluation of Relocation of the UV Storm Water Treatment Facility

Introduction

As part of the La Salina Lift Station and Plant Decommissioning Project, the City of Oceanside plans to include a public parking facility and bio buffer greenbelt area adjacent to Alta Loma Creek and south of the proposed La Salina Lift Station. As a result, the City requested that the existing UV Storm Water Treatment Facility be relocated in order to accommodate the planned space use.

The City's storm water treatment facility was constructed in 2009 and was designed to divert approximately 900 gpm of dry weather runoff flows from Loma Alta Creek to be treated and then discharged downstream of the berm to the beach. The treatment facility consists of two continuous backwash filters (Dynasand) to filter out solids, algae and other material and two ultraviolet light reactors used for disinfection of viruses and bacteria.

Flows

The original treatment plant design appears to have been based on a total dry weather creek flow of 900 gpm. In discussion with the plant operator, it was indicated that the flows to the storm water plant are about 250 gpm based on operational data since 2009. It is believed that drought conditions may have contributed to smaller dry weather flows entering into the creek. The storm water treatment plant operates from April through September each year and is off line during the remainder of the year. During the fall and winter months, the berm in Loma Alta Creek is removed by the City and all runoff in the creek continues to flow to the ocean.

The intake line from the slide gate wet well area to the existing storm water treatment pump station flows by gravity and the intake operates within a narrow 2 foot +/- band of water in the creek. This is a hydraulically limiting condition because the pipeline isn't deep enough to get more water flowing to the plant. One option might be to relocate the intake pipe to the middle of the creek with some type of screening and lower the pipe elevation to allow for better influent hydraulics. However, permits would be required from the regulatory agencies for construction within the creek floodway. Additionally, the hydraulics issue may be worsened if the plant is located further away from the creek.

Tetra Tech reviewed historical flow pump data to the UV plant for the past four years (2013 through 2016), as well as water quality effluent data prior to discharge back to the creek. The data indicates that the peak day flow had reached about 457,000 gpd or 318 gpm. The average daily flow from the plant during normal operation ranged from about 200 to 260 gpm, which is consistent with what the operations staff indicated at 250 gpm. Due to the configuration of the intake pipe elevation in the creek, this flow is far less than the treatment plant design capacity

17885 Von Karman Avenue, Suite 500, Irvine, CA 92614-6213
Tel 949.809.5000 Fax 949.809.8010 tetratech.com

of 900 gpm. It appears that a smaller replacement facility could be constructed at a capacity of 350 gpm (or 504,000 gpd) of dry weather flows from Loma Alta Creek.

Water Quality

According to previous reports, the treated effluent water quality discharge for this facility shall be below the REC-1 Standards per the California Ocean Plan. The limits are as follows:

- Total coliform 30 day average < 1,000 per 100 mL ; 10,000 single sample max
- Fecal coliform 30 day average < 200/100 mL; 400 single sample max
- Enterococcus 30 day average <35/100 mL; 104 single sample max

Tetra Tech reviewed the influent and effluent water quality data from the plant and many of the actual water quality results indicated non-detect (ND) for coliforms, while some readings were in the 10-15 per 100 mL range, which is still far below the REC-1 standards.

The influent quality coming in to the plant is extremely variable from 3,000 to over 1.6 million total coliforms per 100 mL, but it appears the high numbers are peak values recorded over a 30 minute interval and are not continuous levels. Typically, the range of total and fecal coliforms is about 160,000 per 100 mL and enterococcus levels up to 51,700 per 100 mL.

From review of the water quality data at the final treatment plant discharge, it appears that the UV treatment facility is very effective at reducing total and fecal coliforms and enterococci. In addition, the total and volatile suspended solids concentrations in the treated effluent are generally low.

Site Visit and Condition Assessment

Tetra Tech conducted a site visit of the existing facility to determine the condition of the equipment and whether any items can be reused if the facility were to be relocated. The storm water facility is housed in a masonry block building as shown below. There is a separate electrical and controls room for the Motor Control Center (MCC), panels for the UV equipment and other facilities. The water quality analyzers are located in the UV room. The Dynasand filters are located behind the building and are situated out doors in a concrete pit with containment. A separate wet well and pump station is located adjacent to the treatment plant building as shown below.



Loma Alta Creek Storm Water Treatment Facility



Influent pump station to treatment plant

As shown in the photo at the right, the existing Dynasand filters are located out doors and are constructed with stainless steel tank shells. While these filters are about 7 years old, a substantial amount of rust has formed on the tank and supports due to the marine environment. There may be some moisture occurring at the tank seams. Additionally, since the actual dry weather flows are far less than the original design, the filters are oversized and due to the external condition,

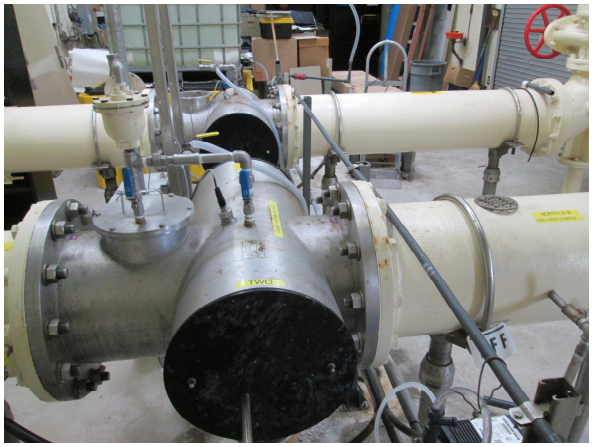


Dynasand Filters

The UV reactors are a closed in-line pipe system inside the treatment building as shown in the photos. There was some visible rust on the exterior housing of the reactors. The operator had indicated that the reactors are not very energy efficient and the monthly electric cost for the UV operation is in the $4,000 to $5,000 range. Since these reactors are approaching 10 years old in technology and are oversized for the current dry weather flows, and there may be more energy efficient reactors. It is recommended that these units be replaced for the new facility.

It does not appear that any of the structural components of the existing plant building could be reused in a new facility.





UV reactors

Alternative Site Layouts

Tetra Tech has prepared two alternative site plans relocation of the UV storm water facility (see attached figures):

Alternative 1 – This option shows the relocation of the UV storm water treatment facility adjacent to the future La Salina plant access road and Pacific Street. The site plan was updated to reflect the public parking area as requested by the Parks/Planning Department. The area by the old pump station and wet well/slide gate area in the southwest corner (shown in gray) would still need to be maintained by the City's Water Utility Department for access and would need to be off limits to the public.

Alternative 2 –This option shows the UV storm water treatment facility located closer to the south side of the property near the old pump station wet well and slide gate area. A similar approximate foot print was used as the existing treatment facility. However, the new facility could potentially be downsized to accommodate the reduced flow rate. It should be noted that the majority of this area is located within the FEMA 100 year floodway and may require additional environmental reviews and permits for construction of the relocated plant. Further, this alternative would impede access by the City for maintenance of the slide gate structure and creek access.

Based on discussions with City staff, it was decided that Alternative 1 is the preferred location for relocation of the storm water treatment facility. The building foot print and layout will be determined during final design.

Equipment Sizing

It is recommended that the relocated treatment facility be designed to accommodate a dry weather flow of approximately 350 gpm. Two media sand filters would still be required but could be smaller in diameter and height. Tetra Tech obtained some additional equipment information from Dynasand on the proposed filter sizing and is presented in the attachment. The total filtration area is approximately 38 square feet for each filter and a loading rate of 4.6 gpm/SF. The tank diameter would be 7 feet with a total height of 15.4 feet. The tank material would be 316 stainless steel. The estimated equipment cost for each filter is approximately $231,000.

Tetra Tech contacted both Trojan and Wedeco for the UV reactors. The existing UV equipment are medium pressure units that are mounted perpendicular to the flow stream. The newer low pressure units are mounted parallel to the flow but take up a bit more space because the bulbs are longer and an additional 5 to 6 feet is needed in front of the units to remove and replace the bulbs. However, these units are more energy efficient. For the 350 gpm design in a single UV reactor, a Trojan model 18AL40 UVFIT could be used. A dose rate of 40 mJ was assumed for the reactor. The estimated equipment cost for each unit is about $75,000 and two units would be provided for redundancy. Wedco has a LBX reactor that uses low pressure, high output lamps which are significantly more energy efficient and consume less power during the UV system's lifetime. Their budget equipment price for two units is $148,000 and is comparable to the Trojan units.

Permits

The original documents for the storm water treatment facility included the following permits:

- Fish and Game 1602
- RWQCB 401
- US Army Corps of Engineers 404
- City of Oceanside Conditional Use Permit

Helix Environmental is preparing environmental documentation for the project, which includes relocation of the storm water treatment facility. It is unclear as to whether any of the existing permits can be amended or whether new permits will be required, but will be addressed during final design.

Project Cost

It appears that the original treatment facility was constructed utilizing pre-purchase agreements for the major equipment items including filters, UV reactors, pumps, and screens. The major equipment cost in 2007 was approximately $900,000. The total plant cost was approximately $2.5 million. It is expected that the approximate construction cost for the new facility will be in the $3 million range. A more detailed construction cost estimate will be prepared during final design.

SE

Attachments

FEMA FLOOD ZONE AE

FEMA FLOOD WAY

CHAIN LIN□ FENCE

FEMA FLOOD □ONE X

PROPOSED LIFT STATION

LOMA ALTA CREEK

EXIST. UV FACILITY

LOAD E□UALI□ATION TAN□

100' BIO BUFFER

EMERGENCY STORAGE TAN□

15' BI□E PATH AND 5' SIDEWAL□

ACCESS ROAD

PUBLIC PAR□ING

ACCESS GATE

ENTRANCE B

ACCESS GATE

RELOCATED UV FACILITY

ADDITIONAL WATER UTILITIES DEPARTMENT FACILITIES

EXISTING OCEAN OUTFALL VAULT

ENTRANCE A

LEGEND:

- PUBLIC PAR□ING
- BIO BUFFER
- PROPOSED AC PAVING LIMITS
- FEMA FLOOD □ONE AE
- FEMA FLOOD □ONE X
- FEMA FLOOD □ONE AE FLOOD WAY
- PROPOSED BLDG
- PROPOSED FENCING
- EXIST BLOC□ WALL

0 30' 60'

SCALE: 1" = 60'

TETRA TECH

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

LIFT STATION SITING AND ACCESS ALTERNATIVE 1

Project No.: 135-09369-15003
Date: SEPTEMBER 2016
Designed By: MBL
Figure 1

Bar Measures 1 inch

Copyright: Tetra Tech

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FEMA FLOOD ZONE AE

FEMA FLOOD WAY

CHAIN LIN□ FENCE

FEMA FLOOD
□ONE X

PROPOSED
LIFT STATION

LOMA ALTA CREEK

EXIST. UV
FACILITY

LOAD
E□UALI□ATION
TAN□

100' BIO BUFFER

EMERGENCY
STORAGE
TAN□

15' BI□E PATH AND 5' SIDEWAL□

ACCESS ROAD

ACCESS GATE

PUBLIC PAR□ING

ENTRANCE B

EXISTING OCEAN OUTFALL VAULT

ACCESS GATE

ENTRANCE A

RELOCATED
UV FACILITY

ADDITIONAL WATER
UTILITIES DEPARTMENT FACILITIES

LEGEND:

- PUBLIC PAR□ING
- BIO BUFFER
- PROPOSED AC PAVING LIMITS
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0 30' 60'
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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

LIFT STATION SITING
AND ACCESS ALTERNATIVE 2

Project No.: 135-09369-15003
Date: SEPTEMBER 2016
Designed By: MBL
Figure
2

Bar Measures 1 inch

Copyright: Tetra Tech

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DYNASAND® FILTER

Specification
Package Unit
DynaSand® Filter

CONSULTANT: TetraTech

CUSTOMER: Oceanside, CA-Loma Alta Creek WWTP

APPLICATION: TSS Removal

DATE: 09-30-16

CELEBRATING 50 YEARS 2010

1401 W. Cypress Rd./PO Box 408399
Fort Lauderdale, FL 33309
Phone : 954 974-6610
Fax: 954 974-618

Part 1 - General

1.01 Scope of Work

A. This specification covers two (2) packaged DynaSand® Filter Model DSF-38 SBTF , as manufactured by Parkson Corporation.

B. The filter shall consist of a cylindrical tank with a conical hopper; feed inlet manifold, feed distribution radials; filtrate weir and flume; airlift pipe, internal sand washer, sand distribution cone(s), reject compartment with weir and flume and a compressed air control system.

C. The filter shall operate in a manner such that the total cross-secitonal area of each filter shall be in a continuous filtration and a continuos backwash mode. There shall be no interruption of the filtration process by shutting down a part or whole filter for backwashing.

D. Filtration media: Silica sand per AWWA Standard B-100. Sand to be delivered to the site.

1.02 Submittals

A. Submit to the Engineer for review, complete drawings showing installation details, materials of construction, arrangement details, loadings, elevations, and all items furnished under this section.

B. The drawings and specifications have been developed with the use of mechanical and process performance data of the Parkson Corporation. The Owner has accepted this data. Alternate manufacturers shall be allowed to bid if they are able to submit the data listed in the above section within the stipulated time frame or if no data is available the manufacturer supplies a 100% performance bond within 7 days from the bid closing in lieu of experience and agrees to run a 14 day performance test that meets the above criteria once the actual equipment has been installed. Failure to meet the performance criteria during the test period will result in forfeiture of the bond.

1.03 Description of System

A. The filter media shall be cleaned internally and redistributed on top of the sand bed. No external sand movement will be allowed. Filter influent (feed flow) shall not be used for sand cleaning.

B. The frequency of sand washing shall be continuous and performed within the filter using filtered water.

C. No backwash pumps, clearwells or mudwells shall be required.

D. The filter shall be an upflow, deep bed, single media filter. The direction of flow through the sandbed shall be upwards with sand moving downward (countercurrent operation). Mixed or multiple media shall not be allowed.

E. The filter shall be designed for a filtration bed depth of 40".

F. The filter shall not contain any moving parts.

G. The filter shall not contain any screens, wedgewires, grids, etc. except in the air lifts and drain lines to retain the media in place.

H. The headloss through the filter shall not exceed 36".

I. The air scouring of the sand shall exceed 100 SCFM/ft^2. This shall be accomplished by the supply of 2.6 SCFM of air per module at 35 psi.

J. For multiple unit installations, the flow between filters shall be self equalizing. No flow controls, regulators, etc. shall be required. Equalization shall not be accomplished by overflow weirs or feed recycle.

Part 2 - Design Details

2.01 Mechanical

A. The filter shall be a upflow filter with continuous backwash, standard bed, single media filter. Mixed or multiple media shall not be allowed.

B. The filter shall operate countercurrently. The feed shall be upflow with sand moving downward.

C. Each filter shall provide a minimum of 38 $ft.^2$ of filtration area.

D. Each tank shall come complete with l50# drilled flanged connections including an 8" feed connection, 3" reject connection, 8" filtrate connection, and a 1" NPT drain connection.

E. The filter shall be designed for a filtration bed depth of 40".

F. The filter shall not contain any moving parts.

G. The filter shall not contain any screens, wedgewires, grids, etc., to retain the media in place.

H. The air supply system shall consist of a separate panel including an air filter, control valve, air flow meter, pressure regulator and pressure gauge.

I. The unit shall come complete with access ladder.

2.02 Process

B. The units shall be designed to filter out suspended solids from a total peak flow of 350 U.S. gpm. Based on 76 ft.2 of total filtration area, the loading rate shall be 4.61 gpm/ft.2.

C. The filter shall produce a continuous filtrate stream and a continuous reject stream and shall not be shut down for any backwash cycles. No backwash inlet valves, pumps, instrumentation shall be required for backwash cycles.

D. The sand bed shall be continously backwashed internally and redistributed on top of the sand bed.

E. Continuous sand cleaning shall be accomplished within the filter using filtered water. Filter influent (feed) shall not be used for sand cleaning. External sand movement or washing will not be allowed.

F. The headloss through the filter shall not exceed 36".

G. The drawings and specifications have been developed with the use of mechanical and process performance data of the Parkson Corporation.

2.03 Performance

A. Capacity

	Units	Design
Flow	gpm	350
Total area	$Ft.^2$	76
Loading rate	$gpm/ft.^2$	4.61
Air required	SCFM	5.2
Max. Average Reject rate	gpm	7-14

B. Raw Feed - Influent

a) TSS: 10 mg/l

C. Filtrate Quality

1. Minimum acceptable clarity at design flow:

a) TSS: 2 mg/l

2.04 Controls

A. General

1. The air supply system shall consist of a separate panel including an air filter, control valve, air flow meter, pressure regulator and pressure gauge.

2. The air control panels shall be mounted on top of each cell, therefore these panels shall be rated for outdoor condition, shall be a NEMA 4X, FRP enclosure.

2.05 Compressed Air System

Existing air compressor to be utilized.

2.06 Quality Assurance

A. Basis of Design: The drawings and specifications are based on Parkson Corporation DynaSand® Filter equipment. Any costs resulting from changes to the structure, piping, etc., required for other approved filter equipment, shall be borne by the Contractor. The Contractor shall submit drawings to the Engineer for approval, showing proposed changes in the structure, piping, equipment, etc.

B. Responsibility: To ensure that all the equipment required for the installation of the filter modules and air supply is properly coordinated and will function as a unit in accordance with the intent of these Specifications, the Contractor shall obtain all the equipment specified under this Section, from a single supplier in whom the responsibility for the proper function of all the equipment, regardless of manufacturer, as an integrated and coordinated system shall be vested. The intent of this paragraph is to establish unit responsibility for all the equipment with the filter equipment supplier. The use of the word "responsibility" relating to the equipment supplier is in no way intended to relieve the Contractor's ultimate responsibility for equipment coordination, installation, operation, and guarantee.

2.09 Materials of Construction

1. Tank: 316 SS
2. Feed Assembly: 316 SS

a. Feed Annulus
b. Airlift Housing
c. Feed Radials
d. Sand Distribution Cone

3. Sand Washer: Polyethylene
4. Reject Compartment: FRP
5. Reject Weirs: PVC
6. Airlift Pump Assembly: PVC
7. Internal Pipe Connections: Rubber with stainless steel clamps
8. Flanges: 316 SS
9. Nuts, Bolts and Fasteners: 316 SS
10. Access Ladder: 316 SS
11. Operating Platform: 316 SS
12. Covering Over Washers: 316 SS

2.10 Filter Media

A. Sand Specification (per AWWA spec B-100)

1. Effective size and uniformity coefficient shall be as recommended by the manufacturer for the application. Confirm at time of ordering.
2. Media type - high grade silica sand. Saturated surface - dry specific gravity 2.5 or more.
3. Media hardness=6.0 or greater on Moh's scale (ref. Testing and Inspection of Engineering Materials; McGraw-Hill Cook Company, New York, NY; 3rd Edition; page 209).
4. Grain shape shall be round to sub-angular. Crushed gravel is usually not acceptable.
5. Acid solubility <5% total loss in mass after 30 minutes immersion in a concentrated (1 part HCl to 1 part distilled H2O) hydrochloric acid solution (HCl).
6. Filter media to be in general accordance with AWWA Standard B-100.

B. Quantity

Provide 18 tons of sand. Contractor to install, disinfect, and wash the media per the filter manufacturer's recommended procedures. Contractor shall check the manufacturer shop drawings to insure correct sand levels.

Part 3 - Execution

3.01 Inspection

A. The contractor shall inspect all equipment upon receipt and repair or replace damaged items as directed by the Engineer, at no additional cost to the Owner.

3.02 Installation

A. General: The contractor shall install filter, supports, platform and handrails, and slide gates in conformance with provisions of these specifications, as shown on the drawings, and in accordance with the manufacturer's recommendations and O&M manuals.

B. The contractor shall install filter media in each filter module per the filter manufacturer's installation instructions.

3.03 Testing and Correction of Deficiencies

A. General

1. All testing shall be performed under the supervision of the filter manufacturer's representative. The contractor shall conduct all specified tests and shall furnish all power, material, instrumentation, equipment, personnel, chemicals, etc., for conducting tests as specified herein. The Contractor shall give the Engineer sufficient advance notice of the testing to enable the Engineer to witness the tests.

2. The Contractor shall submit to the Engineer four (4) copies of full and complete test reports for all tests, describing the units tested; the type of test; test set-ups, and procedures and instrumentation; and test flow rates, pressures, levels and all other data and results as required to demonstrate that all items tested meet specified requirements.

3.04 Start-Up

A. The contractor shall have manufacturer's representative check and verify that installation of the filter modules is in accordance with drawings and manufacturer's installation instructions.

B. The contractor shall have manufacturer's representative adjust all reject weir plates and air rates to each airlift as directed by O&M manuals or manufacturer personnel.

C. The contractor shall start-up and test in accordance with these specifications.

D. The contractor shall have manufacturer's representative instruct plant personnel on operation and maintenance of filters.

E. The filter manufacturer shall include one (1) trip, 3 days, to start-up the filter system and to train the operators.

3.05 Guarantee

A. The filters shall be tested at the specified design flow rate and influent conditions and produce an effluent water and reject flow volume per item 2.03 of this section.

NOZZLE SCHEDULE				
LTR	SIZE INCHES	FACE	SERVICE	REMARKS
A	8	RF	INLET	FEED
B	8	RF	OUTLET	FILTRATE
C	3	RF	OUTLET	REJECT
D	1	NPT	INSIDE DRAIN	VALVE
E	3	NPT	VENT	PIPE
F	1/4	NPT	CUSTOMER AIR	

NOTES:

1. THIS DRAWING TO BE USED FOR GENERAL INFORMATION ONLY. NOT FOR CONSTRUCTION.
2. **MATERIAL OF CONSTRUCTION:**
   - TANK : 11 GA., 304 S.S.
   - AIRLIFT: PVC (2)
3. **WEIGHTS**
   - TANK EMPTY: 3,800#
   - TANK W/WET SAND: 26,300#
   - TANK W/SAND & WATER: 40,900#
4. 9 TONS SILICA SAND REQUIRED.

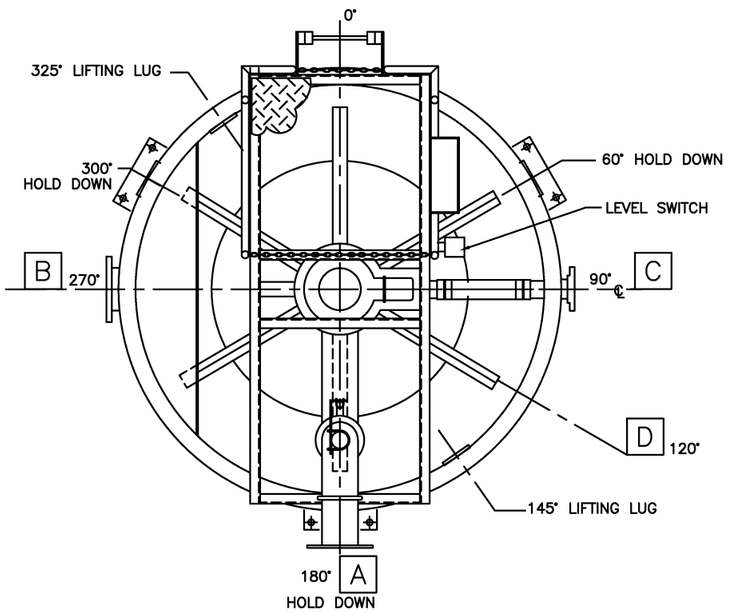
SPECIAL NOTES

1. THE SUPPORTING CONCRETE PAD MUST BE LEVEL.
2. APPLY (1 IN.) MIN. GROUT UNDER EACH BASE PLATE AND UNDER THE CONE AT CENTER.
3. SEE INSTALLATION INSTRUCTIONS BEFORE SETTING GROUT.
4. CUSTOMER ANCHOR BOLT PROJECTION TO INCLUDE GROUT, BASE PLATE (1 1/4 IN.) THICK, PLUS WASHER AND NUT.

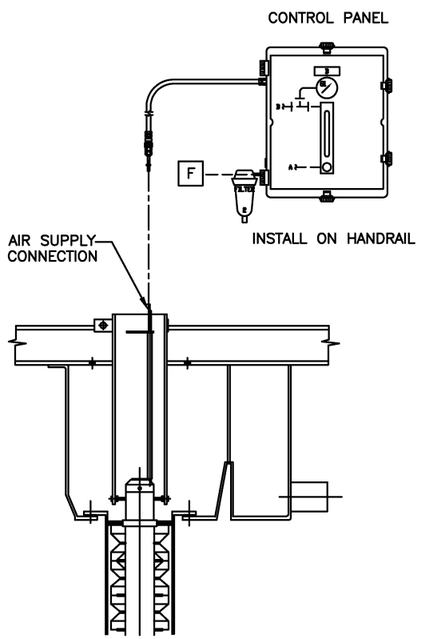
LOADING CONDITIONS
STATIC LOADING

FILTER FULL OF WATER AND SAND:
LOAD UNDER EACH BASE PLATE IS APPROX. 10.2 KIPS
LOAD UNDER CONE AT CENTER IS APPROX. 10.2 KIPS

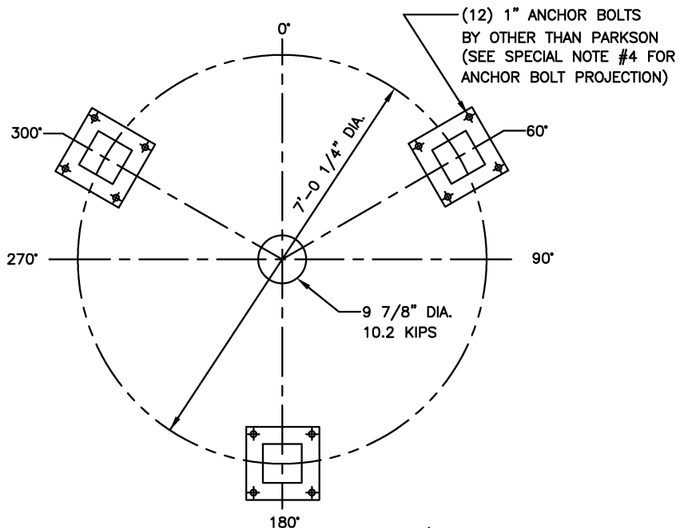
SEISMIC FORCES FROM ZONE 4 MAY CREATE AN OVERTURNING MOMENT OF 63.1 FT.–KIPS AT THE BASE OF THE UNIT. THE LOADS ACTING ON EACH ANCHOR BOLT WILL THEN BE –800# IN TENSION AND 1900# IN SHEAR.



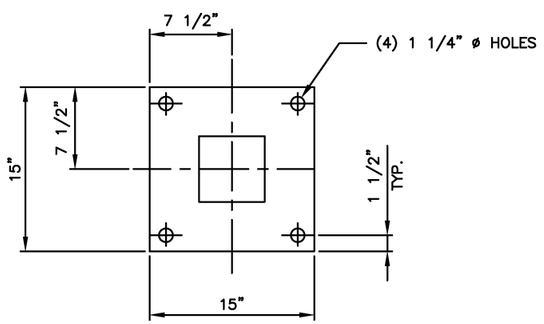
PLAN VIEW



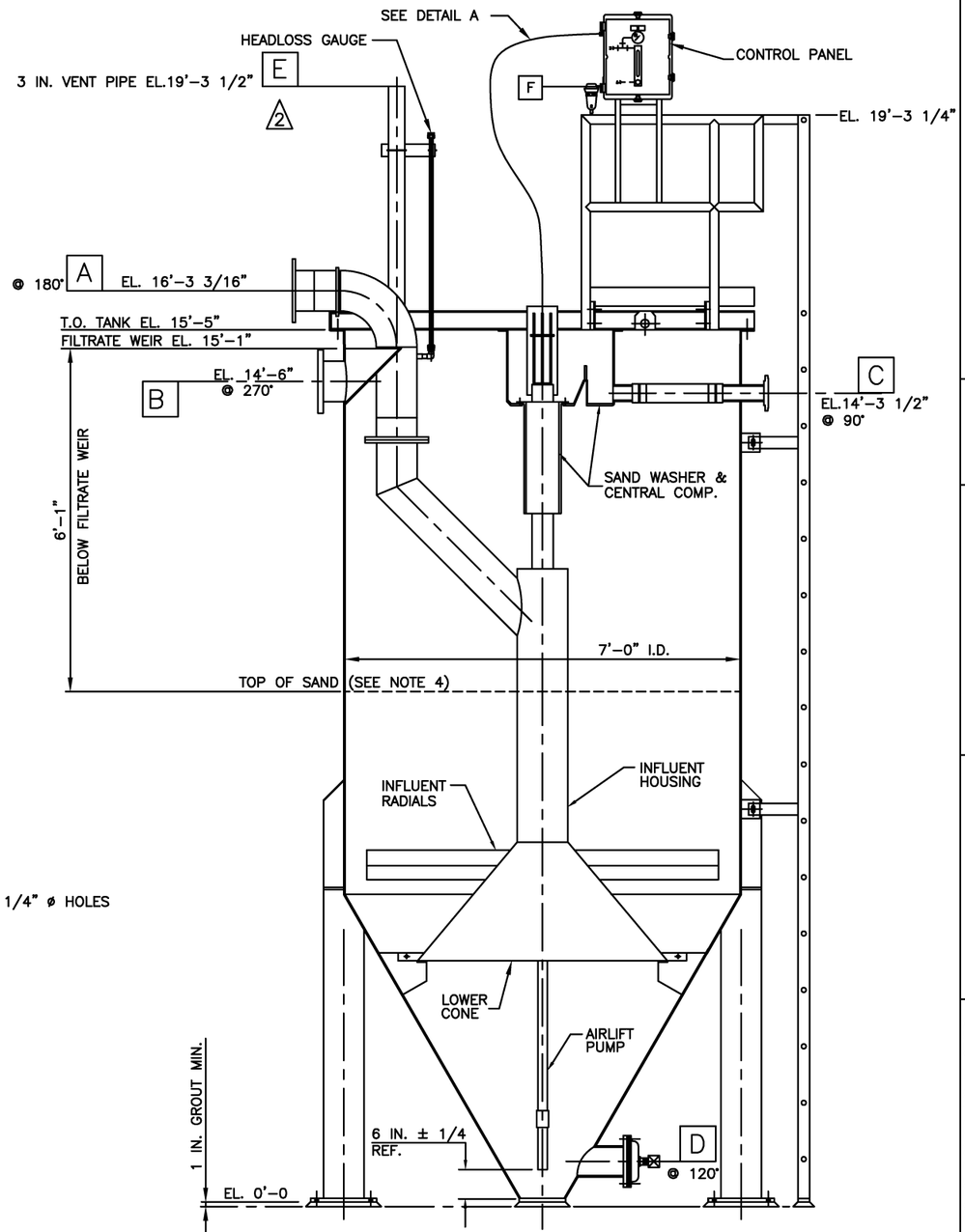
DETAIL A
INST. PANEL TO AIRLIFT CONN.
SCHEMATIC



LOADING DIAGRAM (2)



(2) BASE PLATE DETAIL



SECTIONAL ELEVATION
SEE PLAN FOR TRUE ORIENTATION

PARKSON CORPORATION
DynaSand® Filter

DSF 38FT2 SBTF SS
SALES DRAWING

PROJECT NUMBER:
PROJECT NAME:

DRAWING FILE NUMBER: 003759–01
SHEET NUMBER: 1 OF 1
REVISION: 2

REVISION	DESCRIPTION	CHECKED:	BY:	DATE:
2	ELEVATION OF NOZZLE "E" WAS 18'–1" MODIFIED BASE PLATE AS SHOWN CHANGED MATERIAL OF AIRLIFT PUMP TO PVC	F. CAMARGO	F. CAMARGO	7–15–04
1	SCALE: 3/8"=1'–0"	P .TATASCIORE	P. TATASCIORE	10–2–98
		P. TATASCIORE	F. J. CAMARGO	10–2–98
		F. CAMARGO	F. J. CAMARGO	11–2–98

APPROVED: F. J. CAMARGO
SIZE: B
CHECKED:
APPROVED:
DRAWN:
SIGNATURES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN FEET AND INCHES
TOLERANCE: ±

THE OWNER, PROJECT ENGINEER, AND ALL OTHERS INVOLVED WITH THE PROJECT DESIGN MUST IMPLEMENT AND FOLLOW ALL SAFETY STANDARDS REQUIRED BY LOCAL, STATE AND FEDERAL LAWS WHEN INCORPORATING PARKSON CORPORATION EQUIPMENT INTO THE OVERALL PROJECT DESIGN. PARKSON CORPORATION WILL NOT BE RESPONSIBLE FOR LOCATION AND/OR PLACEMENT OF EQUIPMENT IN THE PLANT DESIGN, NOR IS PARKSON RESPONSIBLE FOR PLANT SAFETY DESIGN AND FOR THE FAILURE TO FOLLOW APPROPRIATE SAFETY PRECAUTIONS IN THE OPERATION AND MAINTENANCE OF PARKSON CORPORATION EQUIPMENT.

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1401 W. Cypress Creek Road, Fort Lauderdale, FL
33309 tel: (954) 974-6610 fax: (954) 974-6182

DYNASAND® CONTINUOUS BACKWASH SAND FILTER

Preliminary BUDGET Sizing
Oceanside, CA-Loma Alta Creek WWTP

APPLICATION : **TSS Removal**

DESIGN DATA

Design: **350** gpm = **0.5** mgd

	pH	Temp deg C	Turbidity NTU	TSS mg/L	TP mg/L	TN mg/L	NO-x-N mg/L
Influent	7	25		10			
Effluent				2			

* - All effluent limits may require chemical addition (by others)

RECOMMENDATIONS:

2 DynaSand Model DSF38 SBTF Package units

Filtration Area per unit **38** ft2
Loading Rate: Design: **4.61** gpm/ft2, all units in service
Total filtration area **76**

Filtration depth **40** in.
Total sand requirement **18** tons
Sand required per unit **9**
Typical headloss across filter **18 to 24 inches**
Design headloss across filter **36** in. WC
Total air consumption **5.2** scfm at **35** psig
Total reject flow per unit **7.00** to **14.00** gpm continuous (on average)

Package filter dimensions: **7.0** ft Dia **15.4** ft Height

MATERIALS

Tank:	**316 SS**
Feed Assembly:	**316L SS**
Hardware:	**304SS**
Reject compartment:	**FRP**
Airlift pump:	**PVC**

SCOPE

All filter internals, filter media
FRP NEMA 4X Air Control Panel.
Local headloss gauge, low level float switch
Access Ladder & Platform
Compressor package sized and supplied by other than Parkson.
Start-up visit including travel & living expenses.

BUDGET PRICING **$231,000** USD, FOB factory - Equipment & sand freight allowed, taxes extra.

SHIPMENT

Submittals 5 weeks after receipt of written purchase order.
Shipment 13 weeks after receipt of approved drawings or submittal waiver.

* -

Rob Troupe 30-Sep-16
RM: John Deogracias

TROJAN UV FIT™



WASTEWATER DISINFECTION FILTERED IN-PIPE TREATMENT

TROJANUVFIT™



Proven TrojanUV Closed-Vessel Chambers for Reuse Disinfection.

Validated, chemical-free disinfection from the industry leader

Around the globe, wastewater treatment plants of all sizes are responding to the water quality and quantity demands of the communities they serve. As more municipalities adopt wastewater reuse policies and practices, wastewater treatment plants are required to treat effluent to higher levels–essentially eliminating all pathogens prior to reuse or discharge.

Depending on site and design conditions, wastewater treatment plants producing filtered effluent sometimes prefer a disinfection solution using closed-vessel or pressurized UV chambers. The TrojanUVFit™ offers an effective and energy-efficient closed-vessel UV solution. This compact chamber is available in multiple configurations to treat a wide range of flow rates. The streamlined hydraulic profile of closed-vessel systems disinfect filtered effluent without breaking head in the treatment process. These benefits, along with UV's ability to provide environmentally friendly, chemical-free treatment for chlorine resistant microorganisms (such as *Cryptosporidium* and *Giardia*) make the TrojanUVFit closed-vessel solution an attractive option for wastewater disinfection.

Key Benefits

TrojanUVFit

Fully validated performance. System sizing is based on actual dose delivery verified through bioassay validation. Real-world, field performance data eliminates sizing assumptions and risks associated with theoretical dose calculations.

Compact design. The small chamber footprint simplifies indoor retrofit installations and reduces construction costs.

Reliable, proven components. UV lamps, quartz sleeves, electronic lamp drivers, sensors and sleeve wiping system have been tested, proven reliable and are operating in hundreds of installations.

Design flexibility. Chambers can be installed in parallel or in series, making it simple to incorporate redundancy or future expansion needs.

Wide range of flow rates. Peak flow rates per chamber are suitable for either individual post-filter or manifold installation. Flows up to 7 MGD per chamber – the largest validated low-pressure lamp in-pipe wastewater system in the industry.

Validated lamp performance. Lamp output and aging characteristics validated through industry protocols and proven through years of operating experience.

Automatic wiping. Automatic sleeve wiping saves operator's time and money. Ensures the maximum UV output is available for disinfection and minimizes energy consumption.

Global support. Local service. Our comprehensive network of certified service providers offers fast response for service and spare parts.

Guaranteed performance and comprehensive warranty. Our systems include a Lifetime Disinfection Performance Guarantee.

TROJAN UV FIT™

Designed for efficient, reliable performance

System Control Center (SCC)

The microprocessor or Programmable Logic Controller (PLC) based controller continuously monitors and controls UV system functions. Supervisory Control and Data Acquisition (SCADA) communication for remote monitoring, control and dose pacing is available. Programmable digital and analog input/output (I/O) capabilities can generate unique alarms for individual applications and send signals to operate valves and pumps.

Sleeve Wiping System

Automatic sleeve wiping system operates online without interrupting disinfection. The wiping sequence occurs automatically at preset intervals without operator involvement.

Amalgam Lamps

High-output amalgam lamps are energy-efficient and save operating costs due to reduced electrical consumption. Lamps are located within protective quartz sleeves with easy access from the service entrance.

UV Intensity Sensor

Highly accurate, photodiode sensor monitors UV output within the chamber. The sensor ensures UV light is fully penetrating the water for complete disinfection.



This chamber contains lamps in both ends of the chamber. Multiple inlet and outlet flange orientations are available.

Power Distribution Center (PDC)

The PDC panel distributes power to the chamber, UV intensity sensor and sleeve wiping system. The panel also houses high-efficiency, variable-output lamp driver (60 – 100% power) with proven performance in hundreds of installations around the world.



End Cap

The end cap protects and isolates connections for components such as lamps, sleeves and wiping system. Power is automatically disconnected if end cap is removed thereby ensuring a safe working environment for operators.

UV Chamber

Electropolished 316L stainless steel chamber available in multiple configurations for a wide range of flow rates. Optional flange orientations allow chambers to fit into existing piping galleries or tight spaces.

Regulatory-Endorsed Bioassay Validation

Field testing ensures accurate dose delivery

Benefits:

- Validated in accordance with industry protocols established by National Water Research Institute (NWRI)
- Performance data is generated from actual field testing over a wide range of flow rates and water quality (UV transmission)
- Bioassay testing offers peace of mind and improved public and environmental safety due to verified dose delivery – not theoretical calculations

Compact Chamber for Installation Flexibility

Efficient, cost-saving design enables retrofit or new construction

Benefits:

- Compact footprint simplifies installation and minimizes related capital costs – ideal for retrofit and new construction applications
- Lamps and sleeves are fully serviceable from the chamber end – allowing the system to be installed against walls, other equipment or piping
- Low head loss design simplifies integration into existing process, and avoids additional pumping and associated capital and operational costs
- Multiple flange orientations available – increasing design flexibility



Chambers can be installed in parallel or in series for increased design and installation flexibility.

Amalgam Lamps Require Less Energy

Maintain maximum output and reduce O&M costs

Benefits:

- Each lamp draws 250 Watts
- Our amalgam lamps maintain 98% output during entire lamp life – 20% less decline than competitive UV lamps
- Validated performance provides assurance of reliable dose delivery and prolonged lamp life
- Deliver consistent and stable UV output over a wide range of water temperatures

Built for Reliable Performance and Easy Maintenance

Designed for trouble-free operation and minimal service

Benefits:

- Routine procedures, including lamp change-outs are simple and require minimal time – reducing maintenance costs
- Access to internal components (lamps, sleeves, cleaning system) through service entrance at one end
- Service entrance and connections protected by end cap
- Intensity sensor continuously monitors UV output to ensure dose delivery



The TrojanUVFit lamps are easily replaced in minutes without the need for tools.

Robust Sleeve Wiping System

Automatic wiping system maintains consistent dose delivery

Benefits:

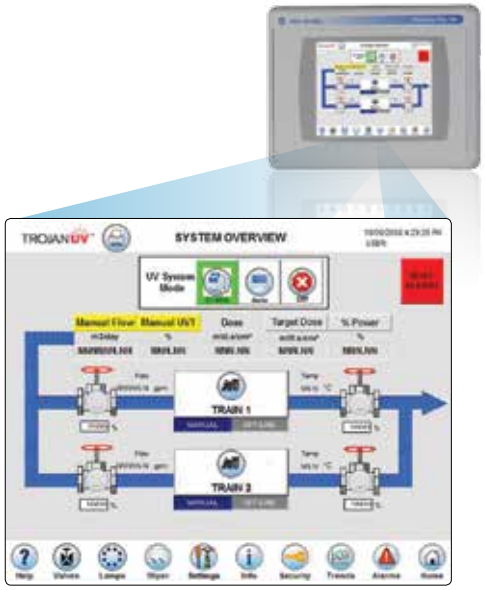
- Wiping system minimizes fouling of quartz sleeves
- Ensures consistent UV dose delivery and optimum performance
- Automatic wiping occurs while the lamps are disinfecting, reducing downtime
- Optional off-line chemical cleaning to reduce maintenance associated with manual cleaning

User-Friendly Operator Interface

Touchscreen display allows easy operation and monitoring

Benefits:

- Microprocessor or PLC-based system controls all functions and dose pacing to minimize energy use while maintaining required UV dose
- Controller features intuitive, graphical display for at-a-glance system status
- Controller communicates with plant SCADA systems for centralized monitoring of performance, lamp status, power levels, hours of operation and alarm status



The PLC-based controller combines sophisticated system operation and reporting with an operator-friendly, touchscreen display.

TROJAN UV FIT™

System Specifications

Model			04AL20	08AL20	18AL40	32AL50	72AL75	D72AL75
Number of Lamps			4	8	18	32	72	144
Lamp Type			High-efficiency, High-output, Low-pressure Amalgam					
Sleeve Wiping			Automatic wiping system					
Lamp Driver			Electronic, constant output (100% power) or electronic, variable output (60 to 100% power)					
Chamber								
Materials of Construction			316L Stainless Steel					
Standard Flange Size (ANSI/DIN), inches (mm)			6 (150)		10 (250)	12 (300)	20 (500)	20 (500)
Outlet Flange Orientation			Multiple orientations available 3, 6, 9 or 12 o'clock position					
Approx. Chamber Length, inches (mm)			80 (2032)	80 (2032)	82 (2083)	90 (2286)	90 (2286)	152 (3860)
Max. Operating Pressure, PSI (bar)			150 (10)	150 (10)	150 (10)	100 (6.8)	65 (4.5)	65 (4.5)
Dry Chamber Weight, lbs (kg)			107 (49)	115 (52)	400 (181)	1600 (726)	2100 (953)	3700 (1678)
Wet Chamber Weight, lbs (kg)			230 (105)		877 (398)	2200 (998)	3700 (1678)	7200 (3265)
Power Distribution Center (PDC)								
Electrical Supply	Standard: Single phase, 2 wire + gnd, 50/60 Hz L-L	120V	N/A	N/A	N/A	N/A	N/A	N/A
		208V	√	√	√	√	N/A	N/A
		240V	√	√	√	√	N/A	N/A
	3 Phase, 4 wire + gnd, 50/60 Hz	400/230V	N/A	N/A	√	√	√	√
Dimensions (H x W x D) inches (mm)		Type 12	30 x 16 x 10 (760 x 410 x 250)		36 x 30 x 10 (920 x 760 x 250)	60 x 36 x 10 (1520 x 920 x 250)	86 x 48 x 24 (2184 x 1219 x 610)	86 x 96 x 24 (2184 x 2438 x 610)
		Type 3R						
		Type 4X	30 x 24 x 10 (760 x 610 x 250)			60 x 36 x 12 (1520 x 920 x 305)		
Material		Type 12	Painted Mild Steel					
		Type 3R	Painted Mild Steel					
		Type 4X	304 Stainless (1.4301 in Europe)					
Panel Rating			NEMA 12, 3R or 4X			NEMA 12 or 4X		
Network Interface			Modbus RTU RS485, Modbus TCP/IP, AB Ethernet I/P, ProfiNet				N/A	
System Control Center (SCC)								
Panel is Required/Optional			N/A (requires only PDC)			Optional	Required	
Electrical			N/A (see PDC)			Two (2) Supplies of 120 V single phase, 2 wire plus ground, 60 Hz, 1.2 kVA (one (1) for the PLC, one (1) for lights & heater)		
Material		Type 12	Painted Mild Steel					
		Type 4X	Stainless(1.4301 in Europe)					
Panel Rating			N/A (see PDC)			NEMA 12 or 4X		
Typical Outputs Provided			Chamber status, common alarms and SCADA communication					
Network Interface			Modbus RTU RS485, Modbus TCP/IP, AB Ethernet I/P, ProfiNet					

TrojanUV is part of the Trojan Technologies group of businesses.

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For a list of our global offices, please visit **trojanuv.com/contactus**.

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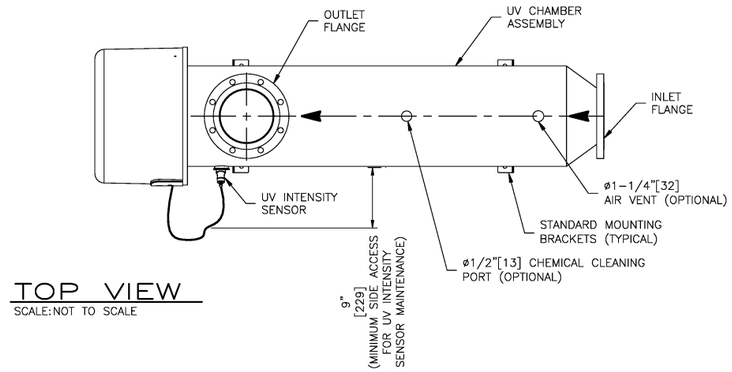
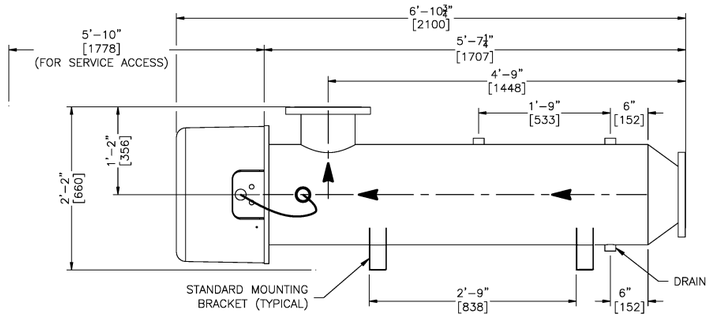
TROJAN UV
WATER CONFIDENCE™



TOP VIEW

SCALE:NOT TO SCALE



FRONT VIEW

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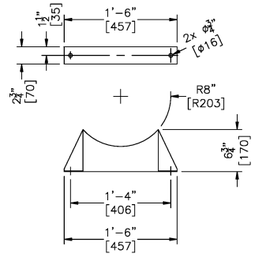


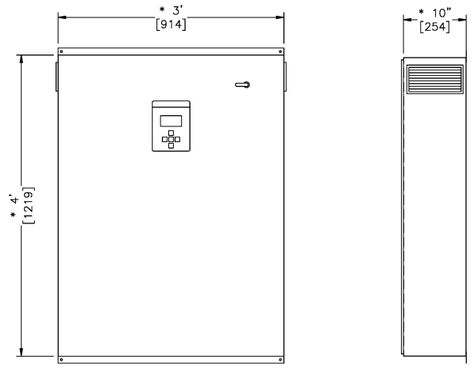
DETAIL A–A

SCALE: NOT TO SCALE (STANDARD MOUNTING BRACKETS)

MODEL	LAMP LENGTH	UV CHAMBER ASSEMBLY DIAMETER	# LAMPS AVAILABLE	FLANGE TYPE	FLANGE SIZE	# BOLT HOLES IN FLANGE	WIPING SYSTEM
18AL40	LONG	16" [400]	18	ANSI/ DIN	10" [250] (STANDARD)	12	AMWS (STANDARD)
					8" [203] (OPTIONAL)	8	NO WIPING SYSTEM (OPTIONAL)

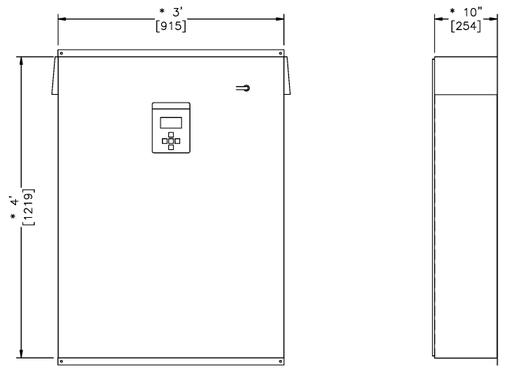
NOTES:

1/ MAXIMUM OPERATING PRESSURE TO BE 150 psi [10 BAR].
2/ STANDARD INTERCONNECTING CABLE LENGTH TO BE 15ft [4.5m].
3/ [ ] INDICATES MILLIMETERS UNLESS OTHERWISE SPECIFIED.
4/ CONNECTION SEALS AND HARDWARE TO BE SUPPLIED BY CUSTOMER.
5/ MOUNTING AND SAMPLING PORTS ARE TO BE SUPPLIED BY THE CUSTOMER.
6/ CLEARANCES FOR WIPING SYSTEMS FALL WITHIN CLEARANCES REQUIRED FOR SLEEVE REMOVAL.
7/ OUTLET ORIENTATION OPTIONS : TOP (STANDARD), LEFT, RIGHT, AND BOTTOM. TOP OUTLET IS SHOWN FOR CLARITY.
* INDICATES DIMENSIONS SHOWN ARE SUBJECT TO CHANGE DEPENDING ON SITE SPECIFIC REQUIREMENTS.



CONTROL POWER PANEL (CPP)

SCALE:AS SHOWN
NOTE: TYPE 12 OR TYPE 3R PANEL SHOWN.



CONTROL POWER PANEL (CPP)

SCALE:AS SHOWN
NOTE: TYPE 4X PANEL SHOWN.

TROJANUV

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DESCRIPTION: STD, TROJANUVFIT 18AL40 SYSTEM		STD. DRAWING NO.	FT0006
DRAWN BY : TIY/MMB	DATE : 13AP12	REFERENCE NO.	N/A
CHECKED BY : AMP	DATE : 13JN21		
APPROVED BY : SAH	DATE : 13JN24	DWG NO.	REV.
SCALE (11x17) : 1/2" = 1'-0"	LOG NUMBER : N/A	D01	C

WEDECO
a xylem brand

Budget Proposal

City of Oceanside, CA - Stormwater System



prepared for:

Tetra Tech
Steve Ellis

November 7, 2016

Xylem Water Solutions USA, Inc.
14125 South Bridge Circle
Charlotte, NC
28273

November 7, 2016

Tetra Tech
Steve Ellis
17885 Von Karman Ave #400, Irvine, CA 92614

Project Name: City of Oceanside, CA - Stormwater System
Project Number: J16110204492
Revision Number: 0

Dear Steve Ellis,

We are pleased to submit the following proposal for the City of Oceanside, CA - Stormwater System UV opportunity based on the information provided within your inquiry.

The need for an energy efficient UV disinfection process is clear. Compared to medium pressure, the proposed LBX reactor uses low pressure, high output lamps which are significantly more energy efficient and consume far less power during the UV system's lifetime. We have highlighted below the other major benefits of the LBX vessels that can improve the performance of the system and increase the lifespan of the equipment:

- Our system includes our latest low-pressure, high-intensity Ecoray lamps which have a guaranteed life of 14,000 hours and are a more efficient lamp with a lower power consumption requirement. In addition, from a maintenance standpoint, the Ecoray lamps are more robust and easy to remove and replace.
- Latest sensor technology – germicidal UV sensor of reference sensor quality (ÖNORM approved) providing the highest accuracy in UV system monitoring and control.
- Automatic wiping system that prevents fouling of the quartz sleeve with easy replacement of wipers.
- WEDECO's established and proven TotalCare Program provides our customers with proactive services all designed to minimize the cost of ownership to operate and maintain a UV system. TotalCare services can provide our customers with system health checks, efficiency audits, training and preventative maintenance contracts.

Please refer to our local representative Mike Hardy of Misco, 949-637-2701 or us if you have any questions. We look forward to working with you on this exciting project.

Sincerely,

Rich Loeffler
Senior Sales Engineer
(704) 614-4443

Joseph Jordan
Sales Engineer

Table of Content

1 Xylem Overview 4

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2.2 Process Description 6

3 Technical Description 7

4 Price & Scope of Supply 7

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4.2 Budget Price 7

5 Commercial Terms & Conditions 8

6 Attachments 9

6.1 LBX400e GA drawing 9
6.2 LBX400e Electrical Cabinet GA Drawing 9
6.3 Sample Specification 9

1 Xylem Overview

Xylem is a leading global water technology provider, enabling customers to transport, treat, test and efficiently use water in public utility, residential and commercial building services, industrial and agricultural settings. The company does business in more than 150 countries through a number of market-leading product brands, and its people bring broad applications expertise with a strong focus on finding local solutions to the world's most challenging water and wastewater problems.



Xylem's treatment business offers a portfolio of products and systems designed to effectively meet the demands and challenges of treating water and wastewater. From smarter aeration to advanced filtration to chemical-free disinfection, Xylem leverages its well-known Treatment brands, Flygt, Leopold, Sanitaire, and Wedeco, to offer hundreds of solutions backed by a comprehensive, integrated portfolio of services designed to ensure we can meet our customers' needs in a number of different industries including municipal water and wastewater, aquaculture, biogas and agriculture, food and beverages, pharmaceuticals, and mining.

Our scientists and engineers utilize their deep applications expertise and continually listen and learn from our customers' situations to create solutions that not only use less energy and reduce life-cycle costs, but also promote the smarter use of water.

WEDECO
a xylem brand

Wedeco has accepted the challenge of the 21st century. With the Wedeco brand for UV Disinfection, ozone oxidation & AOP solutions, we own the advanced technologies for chemical-free and environmentally friendly treatment of drinking water, wastewater and process water as well as further industrial treatment processes. We constantly invest a large portion of our energy in the development of high-tech components, systems and equipment, as well as in the study of new areas of application for UV, ozone & AOP. In doing so, we have always given special attention to the increase in energy efficiency of our Products equipped with our unique UV lamps and ozone electrodes.



The special characteristics of the Wedeco Ecoray UV lamp are its special doping and the unique long-life coating. Because of these features, a constantly high UV light yield is achieved with a substantially extended lamp service life at the same time. In addition, by using this technology it is not necessary to apply liquid mercury inside the lamp. Wedeco UV lamps cannot be surpassed in economic efficiency.

In relation to expenditure of energy, the High-Intensity/Low-Pressure Technology provides a light yield three times higher than comparable UV lamps of widely used Medium Pressure Technology. A higher light yield also means a lower heat generation at the same time.

Thanks to this, Wedeco UV lamps become less susceptible to varying water temperatures. Even the formation of deposits on the quartz sleeves as well as lamp aging is considerably lower than with alternative UV lamp technologies in Herford and Essen.



WEDECO Ecoray UV lamp



Xylem's Wedeco ozone systems combine maximum flexibility and reliable operating characteristics for small to large ozone capacities. The ozone generator system and control unit can be combined and supplemented with option sets that allow for various application requirements.

Effizon evo 2G ozone electrodes are the core of our technology and achieve an unmatched level of reliability and energy efficiency. The electrodes are manufactured completely from inert materials, without the need for fuses or coatings, making them highly resistant to corrosion. This means that the Wedeco ozone generators are practically maintenance free with no need for regular cleaning or replacement of the electrodes.

We rely on consistently high-quality standards in all divisions of the company. Moreover, product quality and manufacturing operations are constantly monitored and optimized in continuous improvement processes. Established quality controls give Xylem and you the security of knowing that Wedeco UV, Ozone & AOP systems will always operate reliably.



WEDECO Effizon® evo 2G Ozone electrode

For more information please visit us at
http://www.xylem.com/treatment/

2 General Process Description

2.1 DESIGN

• Design Flow Rates	
– Design Flow	350 MGD
• Total Suspended Solids (Maximum)	10 mg/l
• Total Suspended Solids (Average)	5 mg/l
• Allowable Effluent Temperature Range	41-86°F
• UV Transmittance at 253.7 nm	65%, minimum
• Maximum Influent Total Coliforms Count	160,000 Total Coliforms/100 mL
• Effluent Disinfection Standard	
– Total Coliforms (30 day geometric mean)	1,000 Total Coliforms/100 mL
– Fecal Coliforms (30 day geometric mean)	200 Fecal Coliforms/100 mL
– Enterococci (30 day geometric mean)	35 Enterococci/100 mL
• UV Dose	
– Minimum Design UV Dose (based on NWRI 2003 MS2 bioassay)	36 mJ/cm²

2.2 PROCESS DESCRIPTION

This UV process will be used to replace an existing disinfection system on site. One duty and one standby reactor are proposed for installation, in a compact space.

3 Technical Description

CONFIGURATION:	LBX 400e	
DESCRIPTION	**UNITS**	**VALUE**
Number of 316L SS vessels Number of lamps per vessel Number of intensity sensors per vessel Total number of lamps		2 (1 duty, 1 standby) 16 1 32
HEADLOSS PER VESSEL (at peak flow):	Inches	4.00
POWER CONSUMPTION: Total Connected Power Per Reactor	kW	 5.2

4 Price & Scope of Supply

4.1 WEDECO SCOPE OF SUPPLY

- Cylindrical 316L stainless steel reactor with integrated baffle plates
- 16 low pressure, high intensity WEDECO Ecoray® UV lamps per vessel
- One (1) Type 12, Fan-cooled, Painted Steel electrical enclosure per vessel
- Calibrated UV intensity monitoring system (UV sensor ÖNORM certified)
- One (1) Microcontroller with Touchscreen HMI per vessel, which allows for:
    - Individual Lamp Status monitoring
    - Hand/Off/Auto system operation
    - Remote operation
    - High and Low priority alarms
    - Variable lamp power and Optidose (50% - 100% dimming)
    - SCADA Communication via Ethernet IP, Profibus, or Modbus
- Automatic wiping system (Electric)
- 39 ft (12 m) lamp cables
- Manufacturer's field service on site [1 trip / 4 days]
- YSI UVT monitor
- Electrical supply: 480 V, 3 phase, 60 Hz, 4 wire + ground

4.2 BUDGET PRICE

LBX Standard Equipment	
Total	***$148,000***

5 Commercial Terms & Conditions

Commercial Details	
Submittal time:	8 weeks after approved purchase order
Delivery time:	18 weeks after approved submittals
Terms of Delivery:	All prices are FCA factory with full freight allowed to the job site.
Terms of Payment:	This proposal is based upon WEDECO's General Terms of Business. Price is based upon the following payment terms (net 30 days): • 10% net 30 days upon initial submittal of mechanical/electrical drawings for approval • 80% net 30 days from the date of the respective shipments of the product • 5% installation of the Xylem equipment, NTE 150 days after shipment • 5% start-up / training on the Xylem equipment, NTE 180 days after shipment
Warranties:	Lamp Warranty: Guaranteed 14,000 hours of operation, prorated after 9,000 hours. System Warranty: 18 months from date of delivery or 12 months from date of substantial completion of UV equipment whichever comes first.



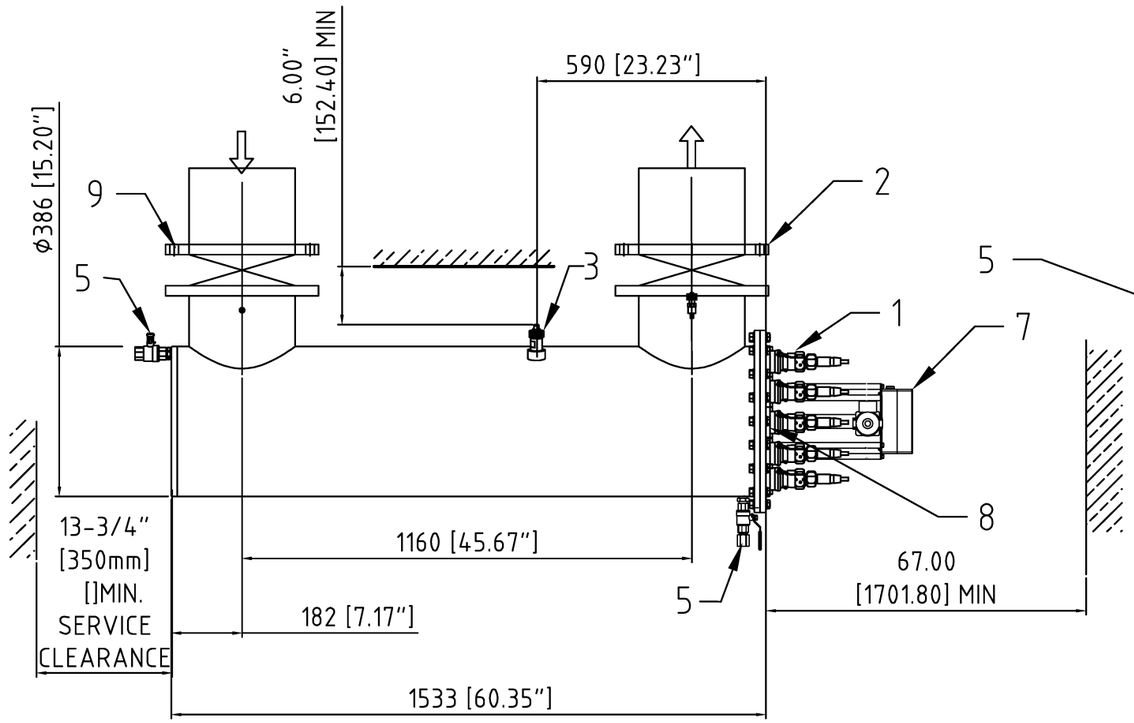
6 Attachments

6.1 LBX400E GA DRAWING

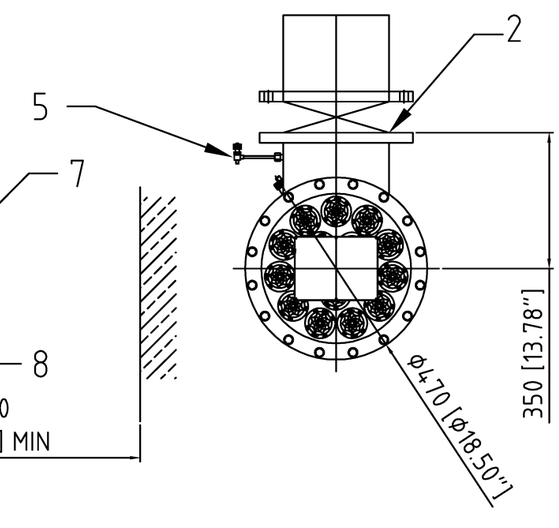
6.2 LBX400E ELECTRICAL CABINET GA DRAWING

6.3 SAMPLE SPECIFICATION

SIDE VIEW



END VIEW

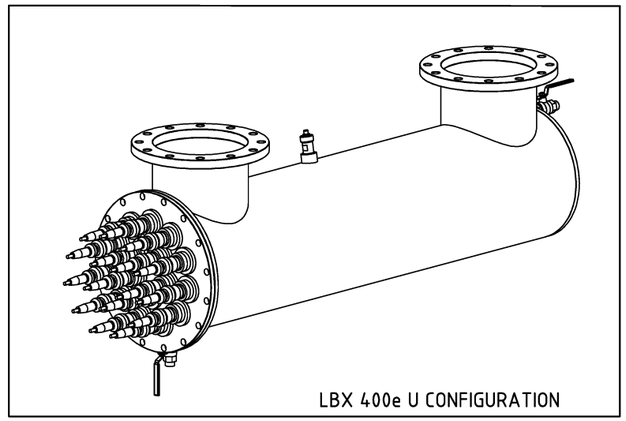


NOTES:

1. The dimensions given on this drawing are required to ensure correct installation operation and performance of the WEDECO UV equipment. All Modifications from this drawing must be approved by WEDECO.
2. Before installation of the UV Equipment all piping must be flushed to prevent objects like sand or stones from damaging components inside the UV vessel.
3. All flow isolation equipment is supplied by others.
4. ALL field wiring and conduits required to connect power and controls to the electrical enclosure and optional wiping unit shall be sized, supplied, and installed by others. All governing Local/state and national electrical codes/regulations apply (for example but not limited to state, local, CE, NEC, cUL)
5. ALL equipment shall be located in accordance with all state local, and national electrical codes and per dimensions shown on this drawing.
6. Protect your eyes and skin against UV light. Extended exposure causes sun burn and eye irritation.

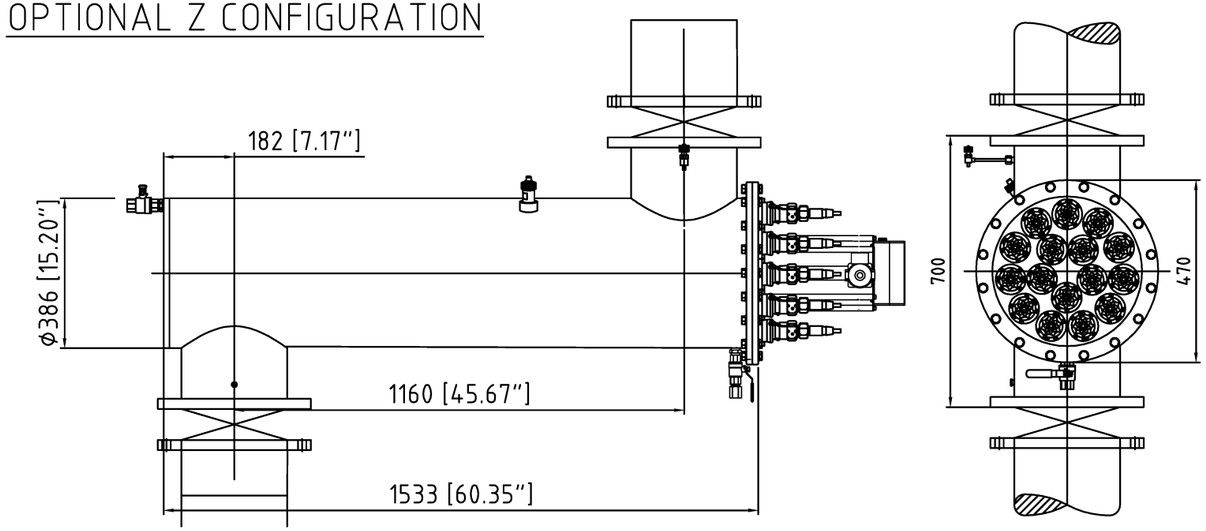
ANMERKUNGEN:

1. Alle Maßangaben dieser Zeichnung sind erforderlich, um eine korrekte Installation, Betrieb und Funktion sicher zu stellen. Alle Änderungen müssen von Wedeco genehmigt werden.
2. Vor der Installation der UV-Anlage müssen alle Rohrleitungen gespült werden, damit Sand, Steine o.ä. keine Komponenten im UV-Reaktor beschädigen können.
3. Alle Absperreinrichtungen sind nicht im Lieferumfang von Wedeco.
4. Alle Verkabelungen, Kabelkanäle und elektrische Anschlüsse des Schaltkastens, sind durch Dritte zu liefern und zu installieren. Alle lokal zutreffenden Gesetze, Normen und Regularien, (z.B. EN, IEC, NEC, cUL, etc.) sind zu berücksichtigen.
5. Die Anlage ist entsprechend den jeweils lokal gültigen Normen, Gesetze und Regularien und gemäß der angegebenen Dimensionen zu installieren.
6. UV-Licht kann Augen und Haut schädigen. Schützen Sie Augen und Haut.



LBX 400e U CONFIGURATION

OPTIONAL Z CONFIGURATION



MOUNTING/EINBAU: PREFERABLY HORIZONTAL/ BEVORZUGT HOTIZONTAL

LBX 400e DN250/ANSI 10"

Item	Description/Beschreibung	Notes/Bemerkungen	Material
1	Lamp Connector/cable to electrical Cabinet/Lampenanschluß /Kabel zum Schaltschrank	16 per Unit/16 je Einheit	-
2	Inlet / outlet flanges/ Eingangs- und Ausgangsflansch	DN250/PN10 EN 1092-1/02 or/oder 10" ANSI B16.5 150 lbs.)	ASTM316 (1.4571)
3	UV Sensor	1 per Unit/1 je Einheit, cable provided for connection to Cabinet Kabel für Anschluß an Schaltschrank bereitstellen	-
4	Ground Connector/ Erdungsanschluß	-	ASTM316 (1.4571)
5	Cleaning and drain/vent valve/ Reinigungs-und Spülventil	2 per Unit/ 2 je Einheit, R 3/4 Din 2999 (3/4" NPT with/mit ANSI units)	ASTM316 (1.4571)
7	Wiping system (Optional)/Wischersystem (optional)	1 per Unit/1 je Einheit requires power/controls connection to Cabinet Anschluß an Schaltschrank erforderlich	-
8	High temperature switch/ Temperaturschalter	1 per Unit, cable provided for connection to Cabinet Kabel für Anschluß an Schaltschrank bereitstellen	-
9	Isolation Valve/ Absperrarmatur	By Others / durch Dritte	ASTM316 (1.4571) recommended
10	Streight Pipe length equal to 0.5 X pipe diameter. Rohrlänge gleich 0,5 x Rohrdurchmesser	By Others / durch Dritte	only required for butterfly type valves nur bei Absperrklappe erforderlich
11	Sign of flowdirection/ Kennzeichnungspfeil der Durchflußrichtung		
12	Nameplate/ Typenschild		

NOT FOR CONSTRUCTION!

FOR DISCUSSION PURPOSES ONLY!

Xylem Water Solutions Herford GmbH
Boschstr. 4 - 14, 32051 Herford, Germany
Tel. +49 5221 930-0, Fax +49 5221 930-222
Info@xyleminc.com
www.xyleminc.com

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Proprietary notice pursuant to DIN ISO 16016 to be observed!

Project: LBX 400e DN250 / ANSI 10 "

Scale: NTS

Measurements without tolerances according to ISO 2768- 1m/2K
Surface according to DIN ISO 1302 Reihe 2

Title: GENERAL ARRANGEMENT DRAWING
UV REACTOR

	Date	Name
Drawn	02.06.2013	D.Raymond
Chkd.		

Material : | Weight:

Article-ID: | Drawing-Nr.: U-86623-0 | sht

Rev.	Description	Date	Name

EDV Nr. U-86623.dwg

of

A2

DRAWING NO.	DESCRIPTION	SHEET NUMBER
C48eUL-ECO-FN-DOC_001	TABLE OF CONTENTS	SHEET 1 OF 10
C48eUL-ECO-FN-DOC_002	ENCLOSURE LAYOUT (1/2)	SHEET 2 OF 10
C48eUL-ECO-FN-DOC_003	ENCLOSURE LAYOUT (2/2)	SHEET 3 OF 10
C48eUL-ECO-FN-DOC_004	GENERAL INFORMATION	SHEET 4 OF 10
C48eUL-ECO-FN-DOC_005	NAMING CONVENTION	SHEET 5 OF 10
C48eUL-ECO-FN-DOC_006	TERMINAL BLOCK	SHEET 6 OF 10
C48eUL-ECO-FN-DOC_007	SPARE	SHEET 7 OF 10
C48eUL-ECO-FN-DOC_008	INTERCONNECTION OVERVIEW	SHEET 8 OF 10
C48eUL-ECO-FN-DOC_009	BALLAST / LAMP - LAYOUT	SHEET 9 OF 10
C48eUL-ECO-FN-DOC_010	UL 508A LABEL & FUSE CHART	SHEET 10 OF 10

REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

FOR APPROVAL ONLY

PROJECT: LBXe

LOCATION:

CUSTOMER:

CONSULTING ENGINEER:

NAVISION NUMBER: CNTRL48e UL FN

JOB NUMBER:

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

X/X = $\pm\frac{1}{16}$ .X = ±.05 .XX = ± .02 .XXX = ± .005 ANG = ± 1°

THIRD ANGLE PROJECTION

DESIGNER	DATE
SC	03/11/2013
APPROVED BY	DATE
-	-/-/-

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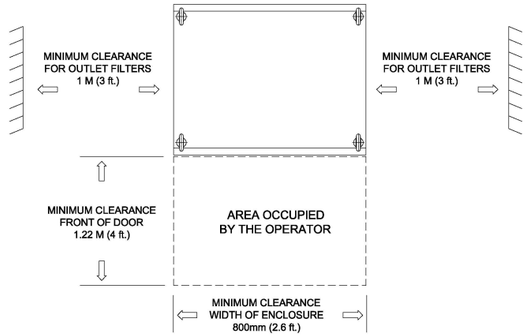
TITLE: TABLE OF CONTENTS ENCL:+G1

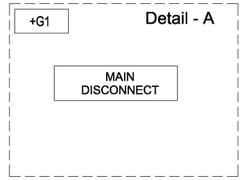
MODEL NO.: LBXe

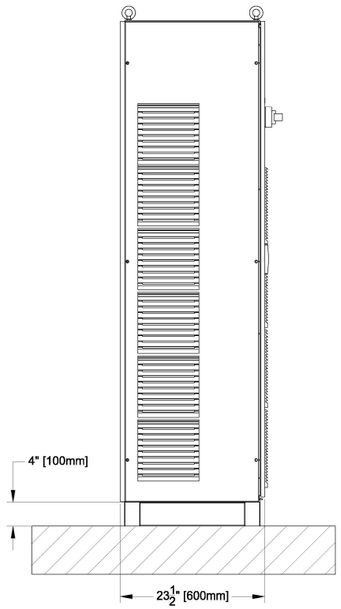
SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_001	2.2

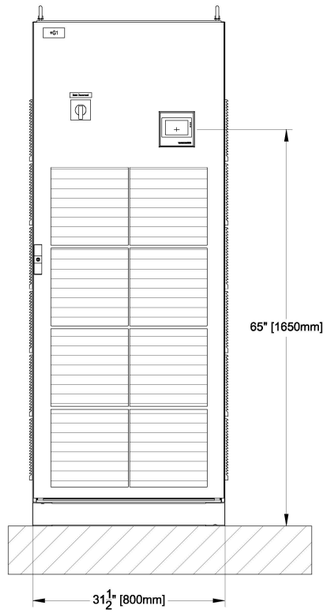
SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	1 OF 10

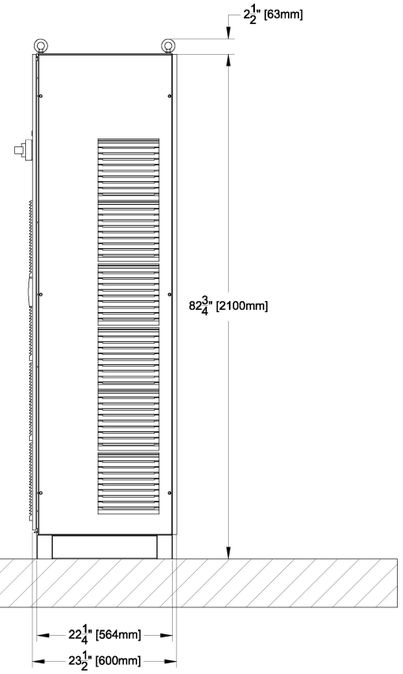
- Type 12 Enclosure

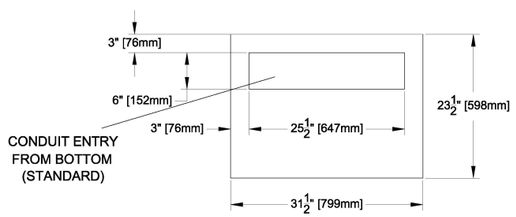












REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

FOR APPROVAL ONLY

PROJECT
LBXe

LOCATION

CUSTOMER

CONSULTING ENGINEER

NAVISION NUMBER
CNTRL48e UL FN

JOB NUMBER

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
X/X =±1/16 .X = ±.05 .XX = ± .02 .XXX = ± .005 ANG =± 1°

THIRD ANGLE PROJECTION

DESIGNER	DATE
SC	03/11/2013
APPROVED BY	DATE
-	-/-/-

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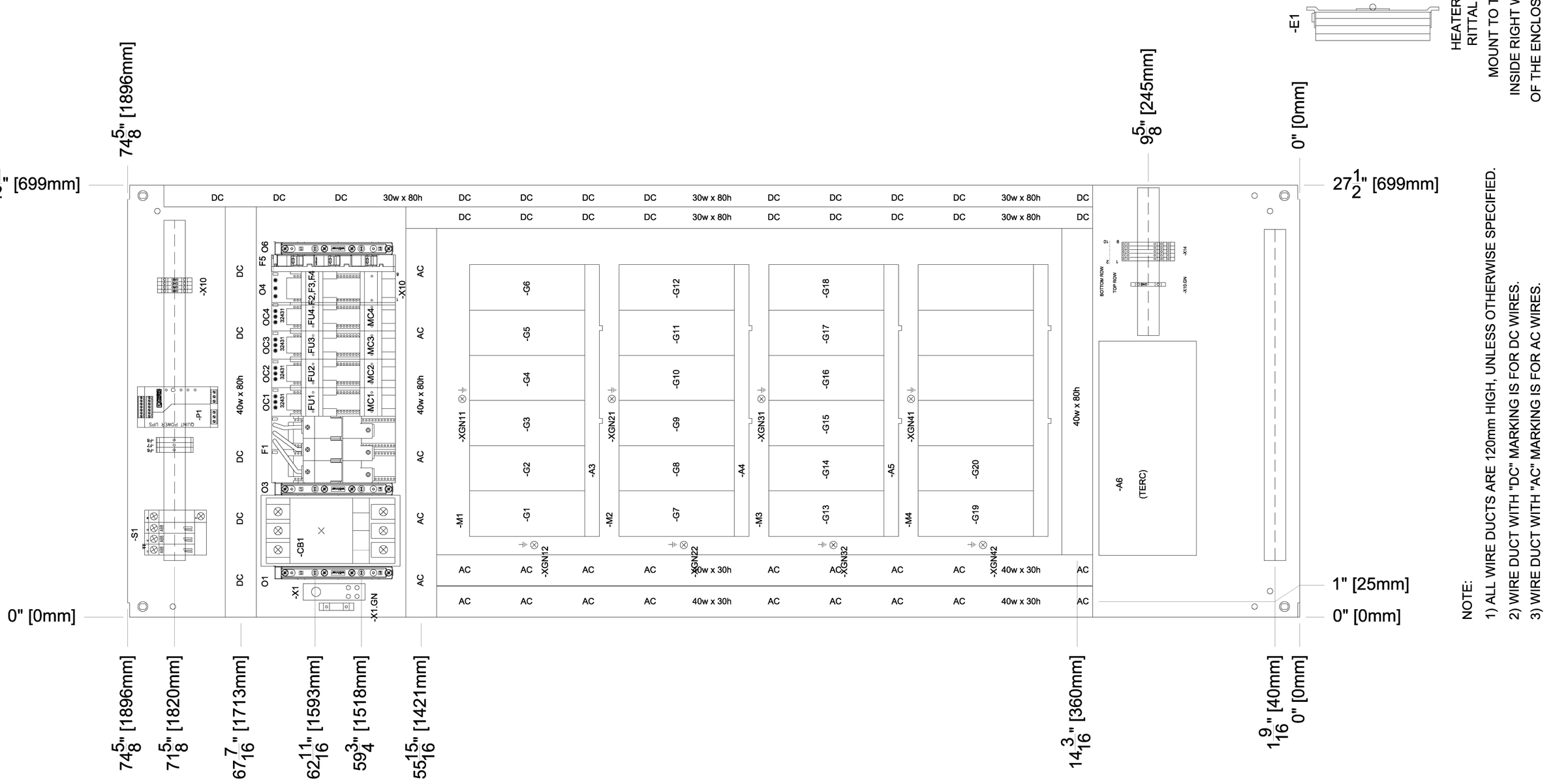
TITLE
ENCLOSURE
LAYOUT (1/2) ENCL:+G1

MODEL NO.
LBXe

SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_002	2.2

SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	2 OF 10



NOTE:
1) ALL WIRE DUCTS ARE 120mm HIGH, UNLESS OTHERWISE SPECIFIED.
2) WIRE DUCT WITH "DC" MARKING IS FOR DC WIRES.
3) WIRE DUCT WITH "AC" MARKING IS FOR AC WIRES.

REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

FOR APPROVAL ONLY

PROJECT: LBXe
LOCATION:
CUSTOMER:
CONSULTING ENGINEER:
NAVISION NUMBER: CNTRL48e UL FN
JOB NUMBER:

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THIRD ANGLE PROJECTION

DESIGNER	DATE
SC	03/11/2013
APPROVED BY	DATE
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TITLE: BACK PANEL
LAYOUT (2/2) ENCL:+G1

MODEL NO.: LBXe

SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_003	2.2

SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	3 OF 10

WIRING SPECIFICATIONS

Wiring shall be performed per Wedeco Standard STDS-351and in accordance with NEC 310.16, 310.17, 250.66.
Wire colors shall be as per Wedeco Standard (STDS-351) and NFPA 79-39 and UL508A 66.9.

All analog signal wire shall be Belden 9341 unless otherwise specified.
All Internal AC Control and DC Control wiring shall be 16 AWG unless otherwise specified.

No ferrulles allowed on power circuits wiring. Ferrules are acceptable for control circuit wiring.

DEFINITIONS:

AC Control: AC line, load, and control conductors at or less then 120 VAC. Examples: wiring to and from thermal switches, relay coils and contacts, pushbuttons, PLC, etc.

Line Voltage: Line power (mains power) is always active unless a mains circuit device (circuit breaker, disconnect, fuse, etc.) is tripped. Examples: power wiring to air conditioners, heaters, fans, relay contacts that provide power to heaters, fans, etc.

AC Neutral: The return (common) side of an AC circuit.

Ground: A conducting connection between an electrical circuit or equipment and earth or a conducting body that services in place of earth.

PR: Twisted, Shielded Pair (Belden 9341)

SR: UV Sensor Cable

DC Power: Ungrounded DC control or supply conductors at the DC power supply potential.

DC Common: Grounded return conductor of a DC circuit.

External Control: Control wiring that leaves/enters the enclosure for hardwire status/control interaction to the customer. May include: AC, DC, Volt Free Contacts, Analog, etc. External Control signals may remain energized when the main disconnect is in the off position.

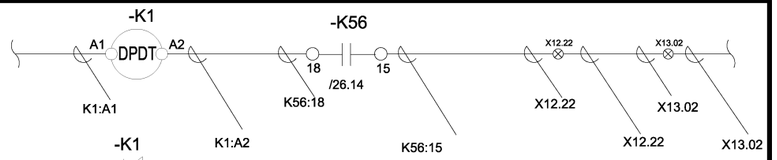
TYPE	COLOR CODE
AC CONTROL	RED (RED)
LINE VOLTAGE	BLACK (BLK) *
AC NEUTRAL	WHITE (WHT) **
GROUND	GREEN W/ YELLOW STRIPE (GRN/YEL) ***
PR	RED (POSITIVE +) / BLACK (NEGATIVE -)
DC POWER	BLUE (BLU)
DC COMMON	WHITE W/ BLUE STRIPE (WHT/BLU)
EXTERNAL CONTROL	YELLOW (YEL)

* Project specific requirements for line voltage color code are met with the use of colored heat shrinks and/or wire labels on wire ends

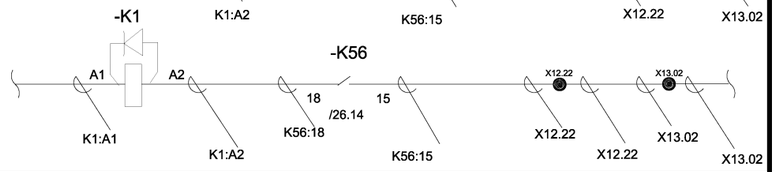
** Neutral wire sizes 6AWG and up shall have black insulation with white heat shrink on wire ends

*** Ground wire sizes 6AWG and up shall have black insulation with green heat shrink on wire ends

ANSI WIRE LABEL DESCRIPTION



IEC WIRE LABEL DESCRIPTION



LEGEND

IEC	ANSI	
		INTERNAL PANEL WIRING
		FIELD WIRING
		FUTURE
		COMPONENT CONNECTION
-X ## ##	-X ## ##	TERMINAL BLOCK
		WIRE CONNECTION
		WIRE CROSSING
TEXT	TEXT	WIRE CROSS REFERENCE (on drawings only)
# OR #	# OR #	WIRE TO PIN NUMBER
		REMOTE LOCATION
		FIELD TERMINATION

IEC	ANSI	
		CIRCUIT BREAKER
F##	F## XXX	FUSE

SYMBOL

IEC	ANSI	
-K-XXX	-K-XXX	CONTROL RELAY COIL
-K-XXX	-K-XXX	TIMER COIL
-H-XXX	-H-XXX R	INDICATING LIGHT
-K-XXX	-K-XXX	RELAY CONTACT OPEN
-K-XXX	-K-XXX	RELAY CONTACT CLOSED
-S-XXX 1 0 2	-S-XXX	SELECTOR SWITCH
-S-XXX	-S-XXX	PUSHBUTTON N.O.
-S-XXX	-S-XXX	PUSHBUTTON N.C.
-Y-XXX	-Y-XXX	SOLENOID COIL
-F-XXX	-F-XXX	PRESSURE SWITCH
-F-XXX	-F-XXX	TEMPERTURE SWITCH
XXX	XXX	LIMIT SWITCH
XXX	XXX	PROXIMITY SWITCH

REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

FOR APPROVAL ONLY

PROJECT: LBXe
LOCATION:
CUSTOMER:
CONSULTING ENGINEER:
NAVISION NUMBER: CNTRL48e UL FN
JOB NUMBER:

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
X/X = ±1/16 .X = ±.05 .XX = ± .02 .XXX = ± .005 ANG = ± 1°
THIRD ANGLE PROJECTION

DESIGNER	DATE
SC	03/11/2013
APPROVED BY	DATE
-	-/-/-

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TITLE: GENERAL INFORMATION
ENCL:+G1

MODEL NO.: LBXe

SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_004	2.2

SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	4 OF 10

NAMING CONVENTION (GENERAL)

"CONTROL 48 e FN" SERIES ENCLOSURE

+G1

"LBX e " SERIES ENCLOSURE (FAN COOLED)
- LBX 400e (16 lamps & 1 UV sensor)
- LBX 550e (24 lamps & 1 UV sensor)
- LBX 850e (32 lamps & 1 UV sensor)
- LBX 1000e (40 lamps & 1 UV sensor)

LAMP CABLE LABEL

- WVS#

LAMP CABLE NUMBER (BALLAST TO VESSEL)

LAMP LABEL

+M1 - V#

LAMP NUMBER
VESSEL ID

ITEM NUMBER in BOM

+G1 - A#

COMPONENT IDENTIFIER
ENCLOSURE IDENTIFIER

DRAWING NUMBER / FILE NAME

C48eUL-xxx-yy-zzz_###

- DRAWING REFERENCE PAGE; SHEET NUMBER
DOC = FRONT PAGE DOCUMENTATIONS ELC = ELECTRICAL SCHEMATICS BOM = ELECTRICAL BILL OF MATERIAL
FN = ENCLOSURE WITH FAN AC = ENCLOSURE WITH AIR CONDITION
ECO = ECOTOUCH CONTROLLED
"CONTROL 48 e FN" SERIES SYSTEM (REFER ABOVE FOR DETAIL)

REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

FOR APPROVAL ONLY

PROJECT: LBXe

LOCATION:

CUSTOMER:

CONSULTING ENGINEER:

NAVISION NUMBER: CNTRL48e UL FN

JOB NUMBER:

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X/X = ±1/16 .X = ±.05 .XX = ± .02 .XXX = ± .005 ANG = ± 1°

THIRD ANGLE PROJECTION

DESIGNER	DATE
SC	03/11/2013
APPROVED BY	DATE
-	-/-/-

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TITLE: NAMING CONVENTION ENCL:+G1

MODEL NO.: LBXe

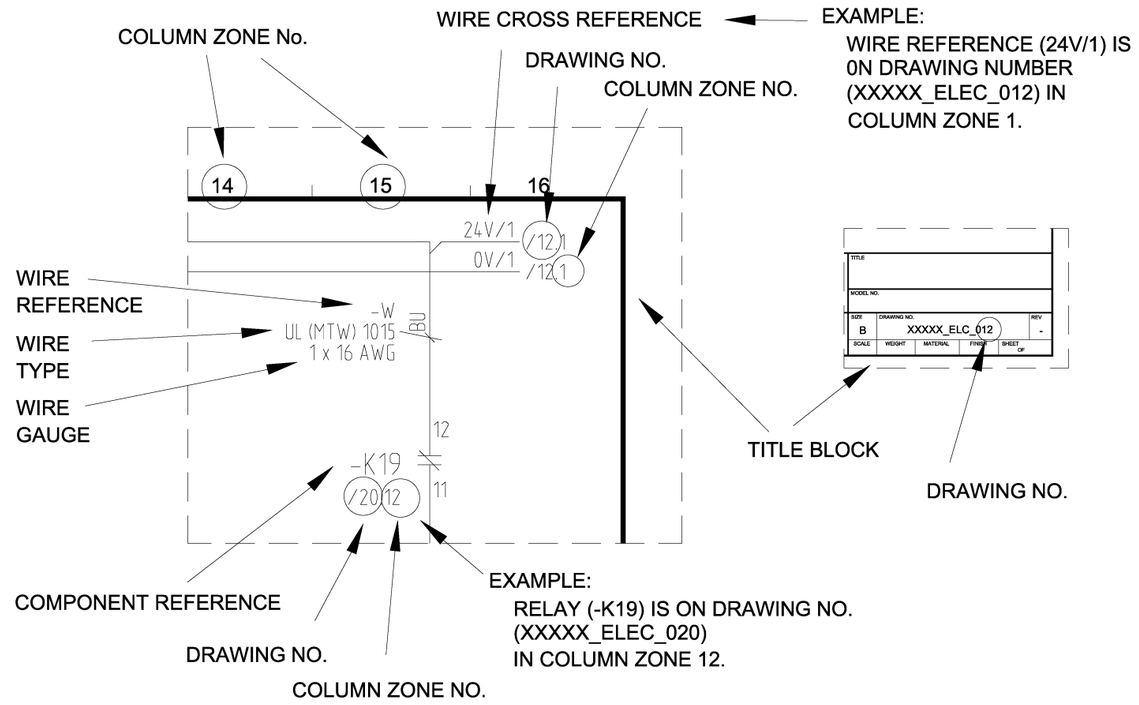
SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_005	2.2

SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	5 OF 10

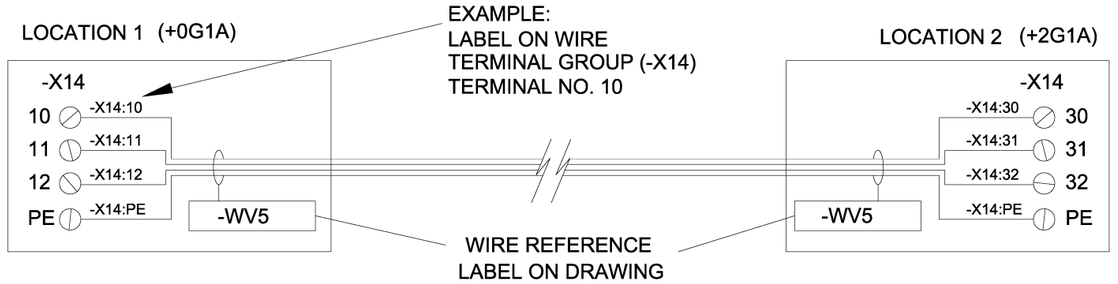
TERMINAL BLOCK LABELING

TERMINAL BLOCK NUMBER	DESCRIPTION	VOLTAGE
-X1.#	POWER SUPPLY	480/277 VAC
-X0.#	NEUTRAL	--
-ST301.#	WIPER POWER @ TERc BOARD TERMINALS	230 VAC
-ST401.#	OUTPUT CONTACTS @ TERc BOARD TERMINALS	240 VAC
-ST301.#	INPUT CONTACTS @ TERc BOARD TERMINALS	5VDC (INTERNAL)
-ST801.#	ANALOG OUTPUT @ TERc BOARD TERMINALS	4 - 20 mA
-ST901.#	ANALOG INPUT @ TERc BOARD TERMINALS	4 - 20 mA

EXAMPLE OF PAGE / COMPONENT CROSS REFERENCE



WIRE / INTERCONNECTION CABLE - LABELING



WIRE CROSS REFERENCE (FOR SCHEMATICS ONLY AND NOT USED AS WIRE LABEL)	DESCRIPTION
EXAMPLE: 24V/1, 0V/1 24V/2, 0V/2	24VDC & DCOM FOR HEATER, RACK FANS, ETC. 24VDC & DCOM FOR CONTROL CIRCUIT.
EXAMPLE: 1/L1M1/1A, 1/L2M1/1A, 1/L3M1/1A 1/NM1/1A 1/PEM1/1A	LINE VOLTAGE TO BALLAST RACK (-M1) LINE NEUTRAL TO BALLAST RACK (-M1) GROUNG TO BALLAST RACK (-M1)

REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

FOR APPROVAL ONLY

PROJECT: LBXe
LOCATION:
CUSTOMER:
CONSULTING ENGINEER:
NAVISION NUMBER: CNTRL48e UL FN
JOB NUMBER:

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
X/X = ±1/16 .X = ±.05 .XX = ± .02 .XXX = ± .005 ANG = ± 1°
THIRD ANGLE PROJECTION

DESIGNER	DATE
SC	03/11/2013
APPROVED BY	DATE
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TITLE: TERMINAL BLOCK DESCRIPTION ENCL:+G1

MODEL NO.: LBXe

SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_006	2.2

SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	6 OF 10

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REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

FOR APPROVAL ONLY

PROJECT: LBXe

LOCATION:

CUSTOMER:

CONSULTING ENGINEER:

NAVISION NUMBER: CNTRL48e UL FN

JOB NUMBER:

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

X/X = $\pm\frac{1}{16}$ .X = ±.05 .XX = ± .02 .XXX = ± .005 ANG = ± 1°

THIRD ANGLE PROJECTION

DESIGNER	DATE
SC	03/11/2013
APPROVED BY	DATE
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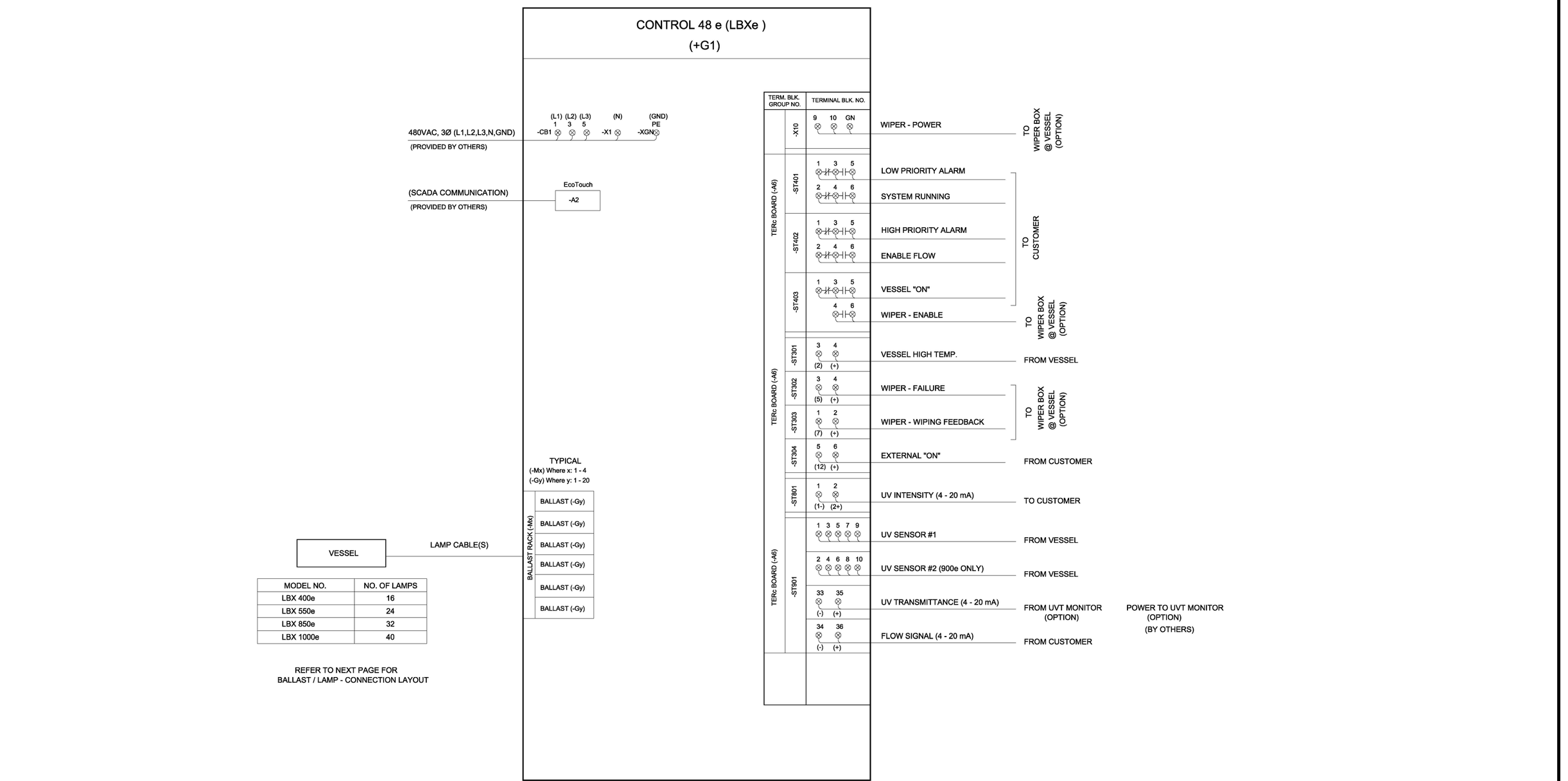
TITLE: SPARE ENCL:+G1

MODEL NO.: LBXe

SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_007	2.2

SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	7 OF 10



MODEL NO.	NO. OF LAMPS
LBX 400e	16
LBX 550e	24
LBX 850e	32
LBX 1000e	40

REFER TO NEXT PAGE FOR
BALLAST / LAMP - CONNECTION LAYOUT

REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

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PROJECT: LBXe
LOCATION:
CUSTOMER:
CONSULTING ENGINEER:
NAVISION NUMBER: CNTRL48e UL FN
JOB NUMBER:

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
X/X = ±1/16 .X = ±.05 .XX = ± .02 .XXX = ± .005 ANG = ± 1°
THIRD ANGLE PROJECTION

DESIGNER	DATE
SC	03/11/2013
APPROVED BY	DATE
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TITLE: INTERCONNECTION OVERVIEW
ENCL:+G1

MODEL NO.: LBXe

SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_008	2.2

SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	8 OF 10

CONTROL 48
ENCLOSURE (+G1)

LBX 400e

BALLAST RACK (M1)

Ballsat (-G1)	Ballsat (-G2)	Ballsat (-G3)	Ballsat (-G4)	Ballsat (-G5)	Ballsat (-G6)

LMS-Flex-SNT (-A1)

BALLAST RACK (M2)

Ballsat (-G7)	Ballsat (-G8)	DUMMY	DUMMY	DUMMY	DUMMY

LMS-Flex-SNT (-A2)

COVER PLATE

COVER PLATE

CONTROL 48
ENCLOSURE (+G1)

LBX 550e

BALLAST RACK (M1)

Ballsat (-G1)	Ballsat (-G2)	Ballsat (-G3)	Ballsat (-G4)	Ballsat (-G5)	Ballsat (-G6)

LMS-Flex-SNT (-A1)

BALLAST RACK (M2)

Ballsat (-G7)	Ballsat (-G8)	Ballsat (-G9)	Ballsat (-G10)	Ballsat (-G11)	Ballsat (-G12)

LMS-Flex-SNT (-A2)

COVER PLATE

COVER PLATE

CONTROL 48
ENCLOSURE (+G1)

LBX 850e

BALLAST RACK (M1)

Ballsat (-G1)	Ballsat (-G2)	Ballsat (-G3)	Ballsat (-G4)	Ballsat (-G5)	Ballsat (-G6)

LMS-Flex-SNT (-A1)

BALLAST RACK (M2)

Ballsat (-G7)	Ballsat (-G8)	Ballsat (-G9)	Ballsat (-G10)	Ballsat (-G11)	Ballsat (-G12)

LMS-Flex-SNT (-A2)

BALLAST RACK (M3)

Ballsat (-G13)	Ballsat (-G14)	Ballsat (-G15)	Ballsat (-G16)	DUMMY	DUMMY

LMS-Flex-SNT (-A3)

COVER PLATE

CONTROL 48
ENCLOSURE (+G1)

LBX 1000e

BALLAST RACK (M1)

Ballsat (-G1)	Ballsat (-G2)	Ballsat (-G3)	Ballsat (-G4)	Ballsat (-G5)	Ballsat (-G6)

LMS-Flex-SNT (-A1)

BALLAST RACK (M2)

Ballsat (-G7)	Ballsat (-G8)	Ballsat (-G9)	Ballsat (-G10)	Ballsat (-G11)	Ballsat (-G12)

LMS-Flex-SNT (-A2)

BALLAST RACK (M3)

Ballsat (-G13)	Ballsat (-G14)	Ballsat (-G15)	Ballsat (-G16)	Ballsat (-G17)	Ballsat (-G18)

LMS-Flex-SNT (-A3)

BALLAST RACK (M4)

Ballsat (-G19)	Ballsat (-G20)	DUMMY	DUMMY	DUMMY	DUMMY

LMS-Flex-SNT (-A4)

REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

FOR APPROVAL ONLY

PROJECT
LBXe

LOCATION

CUSTOMER

CONSULTING ENGINEER

NAVISION NUMBER
CNTRL48e UL FN

JOB NUMBER

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
X/X = $\pm\frac{1}{16}$ .X = ±.05 .XX = ± .02 .XXX = ± .005 ANG = ± 1°

THIRD ANGLE PROJECTION

DESIGNER	DATE
SC	03/11/2013
APPROVED BY	DATE
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TITLE
BALLAST / LAMP - LAYOUT
ENCL:+G1

MODEL NO.
LBXe

SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_009	2.2

SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	9 OF 10

ENCLOSURE NAMEPLATE
(REQUIRED BY UL508A)

1. SHALL BE LOCATED ON INSIDE OF DOOR ENCLOSURE.

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Boschstr, 4 -14
32051 Herford, Germany

Project #, Project Name [1)]
+G1
(FAN COOLED)
Model #: LBXe [2)]
Source: 480Y/277VAC, 4-WIRE (L1,L2,L3,N,GND)
(BY CUSTOMER)

Volts: 480VAC **Hz:** 60 **Phase:** 3 **FLA**[3)]**:** ___ **Largest Motor FLA:**

TYPE-12 (Enclosure)
SHORT CIRCUIT CURRENT RATING: 65 kA

NOTES

1) ENTER PROJECT NUMBER AND PROJECT NAME
2) ENTER MODEL NUMBER
3) ENTER FULL LOAD AMPS (FLA); REFER TO POWER CALC TABLE

FUSE REPLACEMENT CHART
(REQUIRED BY UL508A)

1. SHALL BE LOCATED ON INSIDE OF DOOR ENCLOSURE.

FUSE REPLACEMENT CHART		
FUSE DESCRIPTION	**RATING**	**TYPE**
-F1	15A / 600VAC	CLASS J TIME DELAY
-F2	2A / 600VAC	CLASS CC TIME DELAY
-F3	2A / 600VAC	CLASS CC TIME DELAY
-F4	2A / 600VAC	CLASS CC TIME DELAY
-F5	10A / 600VAC	CLASS CC TIME DELAY
-F6	4A / 150VDC	CLASS CC TIME DELAY
-F7	4A / 150VDC	CLASS CC TIME DELAY
-F8	4A / 150VDC	CLASS CC TIME DELAY
-FU1	15A / 600VAC	CLASS CC TIME DELAY
-FU2	15A / 600VAC	CLASS CC TIME DELAY
-FU3	15A / 600VAC	CLASS CC TIME DELAY
-FU4	15A / 600VAC	CLASS CC TIME DELAY
USE COPPER CONDUCTOR ONLY WITH A TEMPERATURE RATINGOF 90° C (194° F)		

REV	REV # ECN #	SHEET (ZONE)	DESCRIPTION	DATE	APPROVAL
2.2			REMOVE BXe	10/30/2015	SC
2.1			UPDATE TO CONTACTOR WITH FUSE	12/19/2013	SC

REVISIONS

FOR APPROVAL ONLY

PROJECT: LBXe
LOCATION:
CUSTOMER:
CONSULTING ENGINEER:
NAVISION NUMBER: CNTRL48e UL FN
JOB NUMBER:

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE
X/X = ±1/16 .X = ±.05 .XX = ± .02 .XXX = ± .005 ANG = ± 1°
THIRD ANGLE PROJECTION

DESIGNER: SC — DATE: 03/11/2013
APPROVED BY: - — DATE: -/-/-

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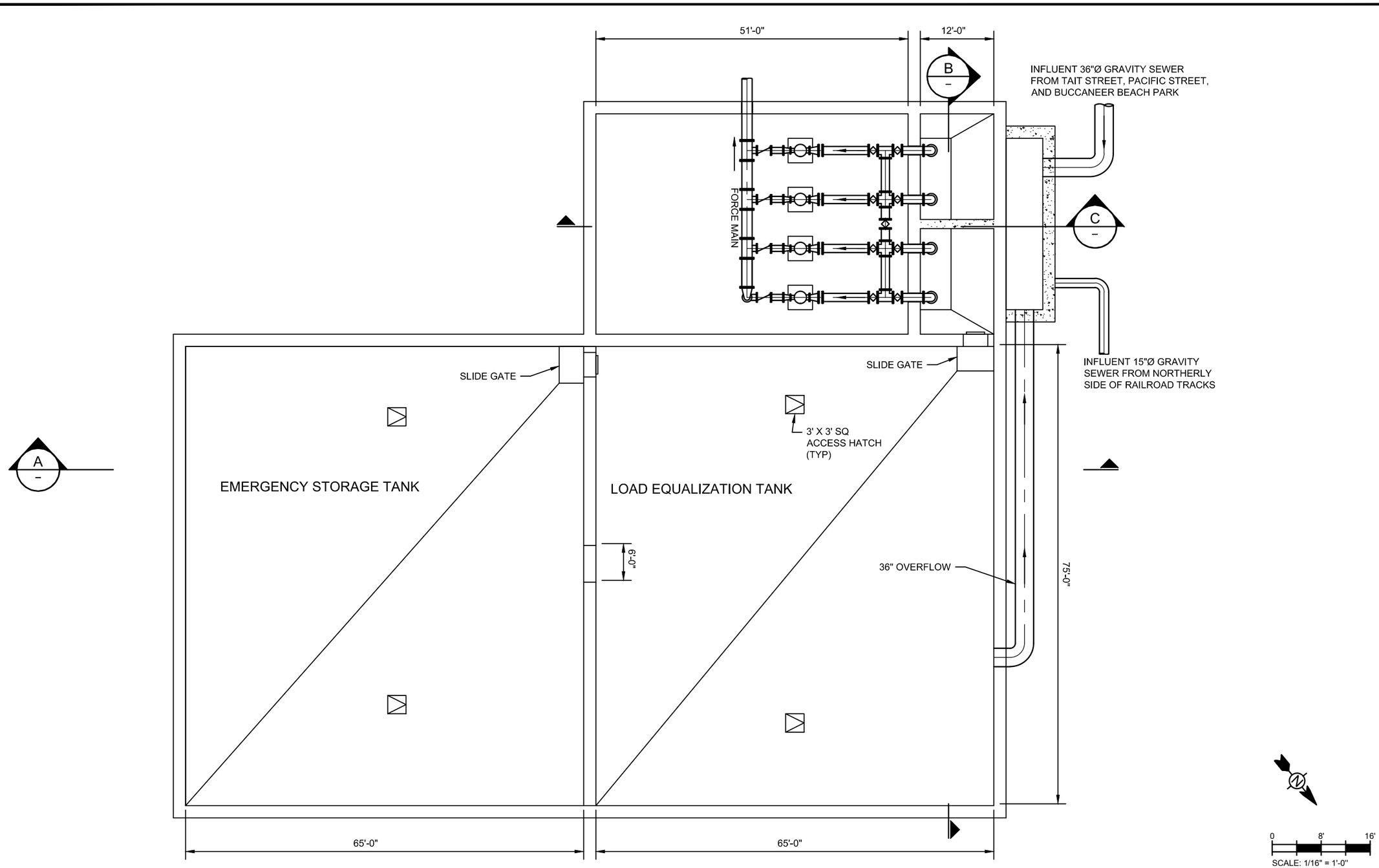
TITLE: UL 508A LABEL
FUSE CHART ENCL:+G1
MODEL NO.: LBXe

SIZE	DRAWING NO.	REV
B	C48eUL-ECO-FN-DOC_010	2.2

SCALE	WEIGHT	MATERIAL	FINISH	SHEET
N/A	N/A	N/A	N/A	10 OF 10

La Salina Lift Station and Treatment Plant Decommissioning

Appendix I. Preliminary Drawings



12/22/2017 10:22:09 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C702-LIFTSTATIONFIG4-3THRU4-5.DWG - WOJTAS, ED, RUSS

TETRA TECH
www.tetratech.com
17885 Von karman Ave, Suite 500
Irvine, Ca. 92614
PHONE: (949) 809-5000 FAX: (949) 809-5010

CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

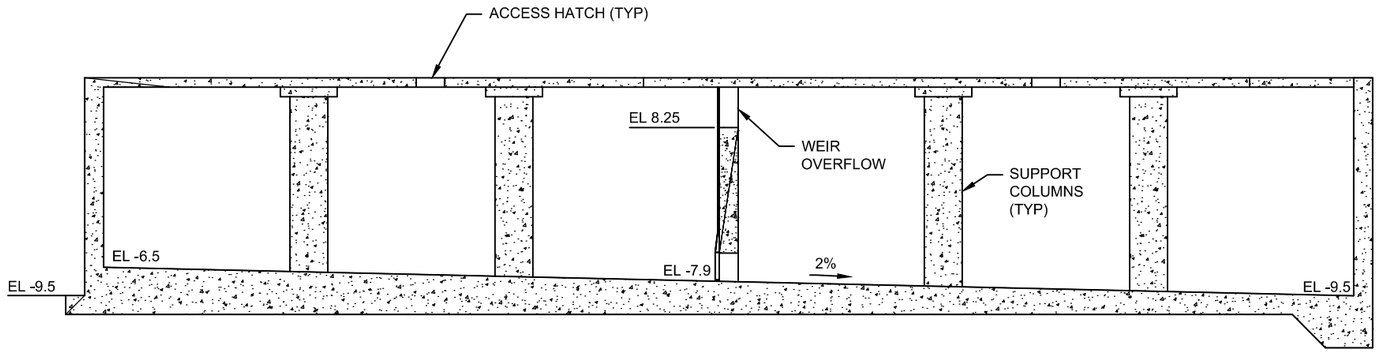
LA SALINA SEWER LIFT STATION PLAN

Project No.:	135-09369-15003
Date:	DECEMBER 2017
Designed By:	MBL

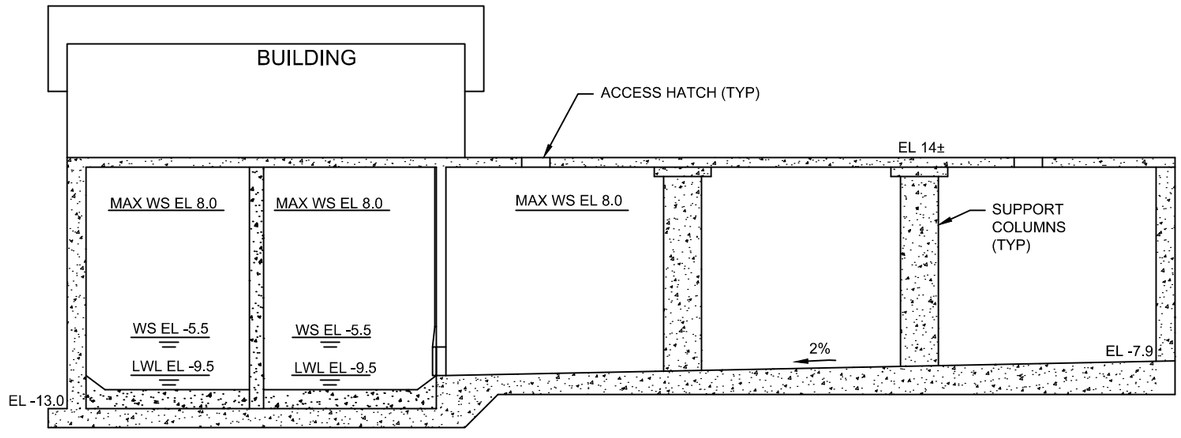
Figure
4-3

Copyright: Tetra Tech

Bar Measures 1 inch



A SECTION
SCALE: 1/16"=1'-0"



B SECTION
SCALE: 1/16"=1'-0"

0 8' 16'
SCALE: 1/16" = 1'-0"

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

LA SALINA SEWER LIFT STATION
SECTIONS A & B

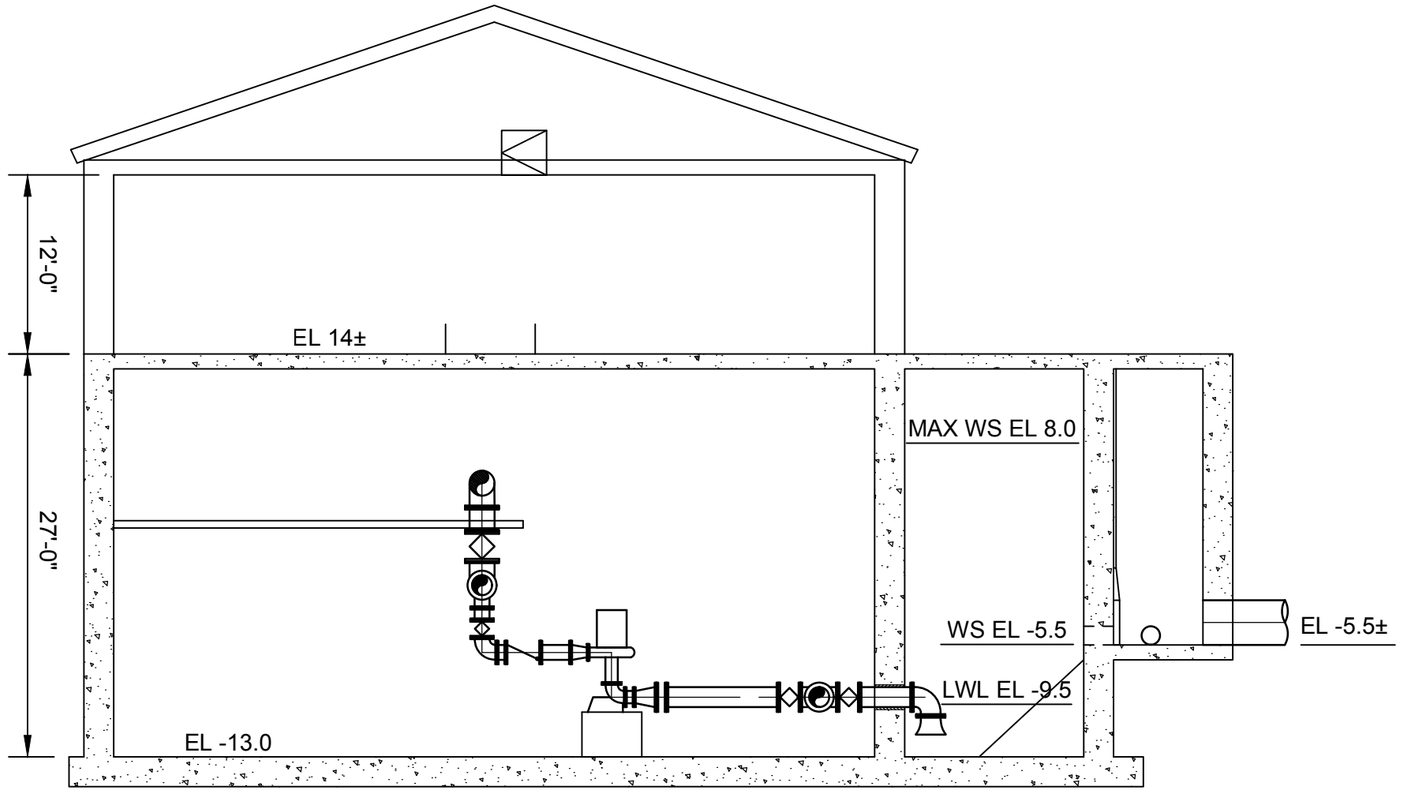
Project No.:	135-09369-15003
Date:	DECEMBER 2017
Designed By:	MBL

Figure
4-4

Bar Measures 1 inch

Copyright: Tetra Tech

12/22/2017 10:22:41 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C702-LIFTSTATIONFIG4-3THRU4-5.DWG - WOJTAS, RUSS



C SECTION
SCALE: 1/16"=1'-0"

0 5'-0 119/128" 10'-1 55/64"
SCALE: 25/256" = 1'-0"

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CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

LA SALINA SEWER LIFT STATION
SECTION C

Project No.:	135-09369-15003
Date:	DECEMBER 2017
Designed By:	MBL

Figure
4-5

Bar Measures 1 inch

Copyright: Tetra Tech

12/22/2017 10:24:32 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C702-LIFTSTATIONFIG4-3THRU4-5.DWG - WOJTAS, RUSS

La Salina Lift Station and Treatment Plant Decommissioning

Appendix J. Pre-Demolition Lead Hazardous Materials Survey Report

January 13, 2016

Ms. Amy Czajkowski, P.E.
City of Oceanside
1330 South Tait Street
Oceanside, California 92054

RE: Lead Hazardous Materials Survey Report
La Salina Waste Water Treatment Plant
1330 South Tait Street
Oceanside, California 92054
Tetra Tech Project No. T35149

Dear Mr. Amy:

Tetra Tech Inc. (Tetra Tech) is pleased to submit the enclosed Pre-Demolition Lead Hazardous Materials Survey Report for the La Salina Waste Water Treatment Plant (La Salina WWTP) (the Site) located at 1330 South Tait Street, in Oceanside, California.

A pre-demolition lead survey was performed for the La Salina WWTP between November 16 and 23, 2015. The La Salina WWTP buildings and treatment systems were evaluated for the presence, location, and quantity of lead-based paint (LBP) and lead-containing materials (LCM) at levels exceeding hazard thresholds, which would require Occupational Safety and Health Administration (OSHA) worker safety precautions during demolition. Tetra Tech screened representative LBP- and LCM-coated surfaces (including ceramic and brick tiles) for lead using a handheld x-ray fluorescence (XRF) analyzer. In addition, confirmation samples were collected and submitted for laboratory analysis for lead.

This letter summarizes Tetra Tech's lead survey findings within the La Salina WWTP.

Tetra Tech obtained 547 XRF readings from suspect LBP and LCM in selected areas within the La Salina WWTP. In addition, 42 XRF calibration readings were collected before and after sampling. The XRF calibration readings ranged from 0.88 milligrams per square centimeter (mg/cm^2) to 1.13 mg/cm^2. During Tetra Tech's survey, forty-four (44) readings indicated the presence of lead at a concentration ranging from 1.01 mg/cm^2 and 9.24 mg/cm^2. One hundred and thirteen (113) readings indicated lead concentrations of 0.01 to <1.0 mg/cm^2. Lead was not detected in 391 readings.

Tetra Tech collected forty-seven (47) confirmation paint chip and bulk samples from suspect LBP and LCM within the La Salina WWTP. Laboratory analysis revealed that three (3) paint chip samples contained detectable lead (0.65 percent by weight [% wt.], 3.5% wt., and 4.5% wt.) above the typical laboratory reporting limit (LRL) of <0.010% wt.

17885 Von Karman Avenue, Suite 500, Irvine, California 92614
Tel (949) 809-5000 Fax (949) 809-5010
www.tetratech.com

We appreciate the opportunity to continue providing services at the site. Please contact us if you have any questions or if we can be of further service.

Sincerely,

TETRA TECH, INC.

DRAFT

NABHAN ODEH
Project Manager
Phone: (949) 809-5076
Enclosure

DRAFT

LONA PEARSON, CAC 13-5051, CLI ID#21287
Cal-OSHA-Certified Asbestos Consultant
CDPH-Certified Lead Inspector/Assessor

PRE-RENOVATION LEAD HAZARDOUS MATERIALS SURVEY REPORT

for
La Salina Waste Water Treatment Plant
1330 South Tait Street
Oceanside, California 92054

Prepared for:
City of Oceanside
1330 South Tait Street
Oceanside, California 92054

Prepared by:
Tetra Tech, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, California 92614

Tetra Tech Project No.
T35149

January 13, 2016

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3.0 SITE STRUCTURES....2
4.0 LEAD FIELD SURVEY AND ANALYTICAL PROTOCOLS....2
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6.0 RECOMMENDATIONS....4
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Appendix B: X-Ray Fluorescence Readings Data

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(Continued)

Appendix C: Laboratory Reports, Chain-of-Custody Forms for LBP and LCM Samples, and Laboratories' ELAP Certificates

1.0 INTRODUCTION

The City of Oceanside retained Tetra Tech, Inc. (Tetra Tech) to perform a pre-demolition lead hazardous materials survey (also referenced as the lead-based paint [LBP] survey or LBP survey) of the La Salina Waste Water Treatment Plant (WWTP) located at 1330 South Tait Street, Oceanside, California (Site). The survey was a prerequisite to a planned demolition of the La Salina WWTP and involved collecting and analyzing samples of suspected lead-based paint (LBP).

The lead survey was performed in advance of the planned demolition of the La Salina WWTP. The lead surveys were also performed to meet Cal-OSHA recommendations for workers protection.

Tetra Tech surveyed suspect lead-based paint (LBP) and suspect lead-containing materials (LCM) within the La Salina WWTP between November 16, 2015 and November 23, 2015. Tetra Tech's survey team included:

- Mr. Geoffrey Mere, Mereson Environmental Services (Mereson), California Certified Asbestos Consultant (CAC) and California Department of Public Health- (CDPH-) certified lead–related construction (LRC) Inspector/Risk Assessor (LRCIA) and Project Monitor (LRCPM).

- Mr. Nabhan Odeh, Tetra Tech, General Contractor-Asbestos, and an Asbestos Hazard Emergency Response Act (AHERA) building inspector, contractor/supervisor, management planner, and project designer.

Certifications for the survey team are provided in Appendix A.

This pre-demolition lead hazardous materials survey report presents the survey findings for LBP on Site surfaces, as well as LCM such as glazed ceramic, brick, and marble tiles. Section 2.0 provides a regulatory overview of State and federal lead requirements generally applicable at the site. Section 3.0 of the report describes the Phase 2 area structures. Section 4.0 discusses the field survey and analytical protocols. Section 5.0 presents Tetra Tech's findings. Section 6.0 provides recommendations based on Tetra Tech's LBP and LCM survey findings. Section 7.0 provides references for previous reports utilized in the preparation of this report.

2.0 REGULATORY OVERVIEW

The USEPA, HUD, and CDPH define LBP as paint containing greater than 0.5% lead by weight, or 5,000 ppm, or 1.0 mg/cm^2 total lead. Federal OSHA and Cal-OSHA regulations (Lead Construction Standard) do not provide a definition for "lead-based paint," but do refer to the USEPA, HUD, and CDPH numbers cited above. Cal-OSHA is primarily concerned with worker protection, and it regulates any amount of lead contained within painted building components.

According to Cal-OSHA (Title 8 CCR Section 1532.1), employers may assume that disturbance of coatings or materials shown to contain less than 0.06% lead by weight (or 600 ppm of lead) will not result in exposures above the applicable Action Level of 30 µg/cm^3, as long as workers are not performing any of the designated trigger tasks (such as building demolition, manual sanding or scraping, abrasive blasting, etc.).

In addition, Cal-OSHA specifies a Permissible Exposure Limit (PEL) for worker exposure to airborne lead particles of 50 mg/cm^3 of air for an 8-hour, time-weighted average. The Federal OSHA Lead Construction Standard also lists an Action Level of 30 $\mu g/cm^3$ for an 8-hour, time-weighted average. Therefore, renovation or demolition activities that include materials with lead at any concentration could, under certain circumstances, trigger the OSHA and Cal-OSHA regulations.

Concentrations of airborne lead generated by disturbing the paints and ceramic tile glazes at the Site would vary based upon several factors, including the type of activity (including "trigger tasks") and the severity of disturbance to the building materials. Determination of airborne lead concentrations would require air monitoring by a trained lead professional during building material disturbance.

Results of the lead surveys should be provided to contractors and subcontractors performing work that may disturb any LBP or LCM at the Site.

3.0 SITE STRUCTURES

The Site consists of several structures, including a single-story administration office building, two single-story maintenance buildings, single- and two-story waste water and sludge treatment buildings, below ground waste water treatment systems, waste water aboveground storage tanks, and below ground waste water pump stations systems. The Site buildings and systems are constructed of a combination of concrete masonry unit (CMU), stucco, reinforced concrete, and wood and metal frames. The floors of the Site buildings are concrete slab-on-grade. The buildings' roof systems are a combination of wood and steel frames, and wood and corrugated metal roof decks. The roof membrane cap consists of a combination of built-up composite and asphaltic shingles over plywood and/or tan lightweight cementitious material. The Site buildings' interior walls are constructed of wood and metal frames.

4.0 LEAD FIELD SURVEY AND ANALYTICAL PROTOCOLS

The lead survey proceeded according to United States Environmental Protection Agency (USEPA), United States Housing and Urban Development (HUD), and CDPH protocols as general guidance. Tetra Tech tested the majority of interior and exterior painted and/or coated surfaces at the Site for the presence of lead utilizing a portable Niton Analyzer (model XL2 Goldd) XRF analyzer unit. The XRF unit allows for non-destructive/non-intrusive measurements of paint up to 3/8-inch thick. Measurements of painted surfaces by the XRF unit were recorded electronically. The XRF measurements and calibration are presented in Appendix B.

Paint chip and bulk confirmation samples of suspect LBP and LCM were also collected during the XRF surveys. Before samples were collected, a wetting agent was applied to suspect LBP and LCM surfaces, to reduce the potential for release of dust during sampling activities. Following collection, all LBP and LCM samples were placed in clean sample containers, labeled, and sealed. The samples remained in the inspectors' custody until they were sent to the laboratory. After each sample was collected, the sampling instruments were wiped clean using a wet, lint-free cloth to prevent cross-contamination between samples. A unique sample identification number was assigned to each sample. After completion of sampling, the LBP and LCM samples were shipped via Federal Express, along with the laboratories' chain-of-custody (CoC) documentation, to LA Testing, Inc. (LA Testing) in Garden Grove and EMSL Analytical, Inc. (EMSL) in Pasadena, California. LA Testing and EMSL are sister companies and are both accredited by the State of California Environmental Laboratory Accreditation Program (ELAP).

Samples were analyzed using flame atomic absorption spectrometry (AAS). The laboratories' detection limit for LBP is <0.010% wt.

5.0 CURRENT LBP AND LCM SURVEY RESULTS

Tetra Tech obtained 547 XRF readings (in addition to 42 XRF calibration readings ranging from 0.88 mg/cm^2 to 1.13 mg/cm^2) from LBP and LCM such as glazed ceramic, brick, and marble tiles that were suspected to contain lead within the La Salina WWTP. During Tetra Tech's lead survey, lead was detected in various amounts in a variety of building components. For this (November 16, 2015 to November 23, 2015) survey, any material containing detected lead at a concentration less than 1.0 mg/cm^2 is considered lead-containing paint (LCP). Sample results fell into one of three categories, as summarized in Table 1

Table 1 – Summary of Lead Sample Results by Category

# Samples	**Category**	**Lead Concentration**
43	Lead-based paint (LBP) or lead-containing material (LCM)	1.0 mg/cm^2 of lead or greater
113	Lead-containing paint (LCP)	<1.0 mg/cm^2 of lead
391	No detected lead (ND)	0 or <0 mg/cm^2 of lead

A summary of the XRF measurements and various paints applied to building components is included in Appendix B.

The samples categorized as LBP/LCM are summarized in Table 2 (below) and include: pink/beige 4-inch square ceramic tiles, white floor sinks, white coated counter top sinks, yellow painted concrete curb, yellow painted light pole concrete base, beige/green painted metal pipes, yellow painted metal handrails and stairs, yellow painted metal posts/bollards, grey painted concrete sump walls, and yellow painted roof access metal frame. Areas of peeling and flaky paint were observed at the La Salina WWTP. The paint was noted to be in fair to poor condition.

Tetra Tech collected forty-seven (47) confirmation paint chip and bulk samples from selected suspect LBP surfaces and LCM within XRF surveyed areas at the Site (see Figure 2-A to 2-L). The selected paint chip and bulk samples were analyzed for lead content by an ELAP-certified laboratory. The paint chip and bulk samples were collected from selected areas where lead was either not detected (ND) or was detected at concentrations ranging between 0.01 mg/cm^2 and 9.24 mg/cm^2 (maximum lead detected by the XRF analyzer). The confirmation samples were collected to supplement the XRF analyzer readings.

The red paint observed on the valve handle in the generator room with lead detected at 0.78 mg/cm^2 and the beige/green paint observed on the 12-inch in diameter metal pipe and 4-inch metal support with lead detected at 3.77 mg/cm^2 by the XRF analyzer had a lead concentration of 0.65% wt. and 4.5% wt. in the confirmation sample by the laboratory analysis, respectively. Laboratory results of confirmation samples for materials where lead was not detected by the XRF had detectable lead ranging from 0.2 to 4.62 above the laboratory reporting limit of 0.010 % wt. Three confirmation samples contained lead concentrations of 0.65% wt, 3.5 wt., and 4.5 wt. The material where these confirmation samples were collected from was tested negative by the XRF analyzer. The AAS results for lead in LBP and LCM with corresponding XRF results are summarized in Table 2 below; the laboratory reports are provided in Appendix C.

Table 2 – AAS and XRF Results for LBP and LCM Samples						
Suite No.	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Material Locations**	**XRF Result (mg/cm^2)**	**AAS Analytical Result (% wt)**
South Aeration/Secondary Clarifier (SASC)	321524546-0002	L00-2	Beige/Green	12" Pipe-SASC North Side	3.77	3.5
	321524546-0004	L00-4	Beige	4" Pipe support-SASC West Side	2.53	4.5
Headworks	321524644-0003	L003	Red	Valve Handle	0.78	0.65

Notes:
% wt = lead percent by weight
AAS = flame atomic absorption spectrometry
LCM = lead-containing material
LBP = lead-based paint

6.0 RECOMMENDATIONS

The results of lead surveys by Tetra Tech confirmed LBP and LCM at the Site. The confirmed LBP and LCM, along with the estimated quantities of each, are summarized in Table 3 below.

Table 3 – Summary of Confirmed LBP and LCM From Tetra Tech's Lead Survey							
Suite No.	**Component**	**Substrate**	**Color**	**Results**	**Pb (mg/cm^2)**	**Comments**	**Quantity**
Administration/ Control Building	4" Ceramic Tile Wall	Ceramic	Pink/ Beige	Positive	9.09	Ceramic tile in east restroom	110 SF
	4" Ceramic Tile Wall	Ceramic	Brown	Positive	8.49	Ceramic tile in east shower room east wall	80 SF
	4" Ceramic Tile Wall	Ceramic	Pink/Beige	Positive	8.63	Ceramic tile in east shower room south wall	80 SF
	4" Ceramic Tile Wall	Ceramic	Pink/Beige	Positive	8.70	Ceramic tile in east shower room west wall	Included above
	Floor Sink	Porcelain	White	Positive	7.17	Floor sink in janitor closet	1 Sink
	4" Ceramic Tile Wall	Ceramic	Pink/ Beige	Positive	9.21	Ceramic tile in west restroom north wall	110 SF
	4" Ceramic Tile Wall	Ceramic	Pink/ Beige	Positive	8.75	Ceramic tile in west restroom east wall	Included above
	Restroom Counter Sink	Metal	White	Positive	8.5	West restroom counter sink	1 Sink
	4" Ceramic Tile Wall	Ceramic	Pink/ Beige	Positive	8.86	Ceramic tile in west restroom west wall	Included above
	Sidewalk	Concrete	Yellow	Positive	1.08	Pedestrian walkway northeast of the administration/control building	100 LF

Table 3 – Summary of Confirmed LBP and LCM From Tetra Tech's Lead Survey							
Suite No.	**Component**	**Substrate**	**Color**	**Results**	**Pb (mg/cm^2)**	**Comments**	**Quantity**
Secondary Digester	Light Pole Base	Concrete	Yellow	Positive	3.22	Light pole located north of the secondary digester above AST	10 SF
	Light Pole Base	Concrete	Yellow	Positive	2.89	Light pole located south of the secondary digester above AST	10 SF
Primary Digester	Light Pole Base	Concrete	Yellow	Positive	3.23	Light pole located west of the primary digester above AST	10 SF
	12" Pipe	Metal	Beige	Positive	1.90	Waste water pipe west of the primary digester AST	20 LF
North Aeration	12" Pipe	Metal	Beige	Positive	2.47	Waste water 12" metal pipe north side	180 LF
	12" Pipe	Metal	Beige	Positive	4.62	Waste water 12" metal pipe east side	Included above
	12" Pipe	Metal	Beige	Positive	4.25	Waste water 12" metal pipe south side	Included above
	12" Pipe	Metal	Beige	Positive	4.14	Waste water 12" metal pipe west side	Included above
Air Blower	Light Pole Base	Concrete	Yellow	Positive	1.84	Light pole located west of the air blower building	10 SF
North Secondary Clarifier	Light Pole Base	Concrete	Yellow	Positive	1.33	Light pole located east of the north secondary clarifier	10 SF
	Light Pole Base	Concrete	Yellow	Positive	2.13	Light pole located west of the hydrogen peroxide AST	10 SF
BG Chamber	Handrail	Metal	Yellow	Positive	9.17	Metal handrail around B.G. chamber, north side	150 LF
	Handrail	Metal	Yellow	Positive	9.24	Metal handrail around B.G. chamber	Included above
	Handrail	Metal	Yellow	Positive	9.03	Metal handrail around B.G. chamber	Included above
RWP Station	Bollard	Metal	Yellow	Positive	2.87	Metal bollard east of the RWP station	5 LF
	Light Pole Base	Concrete	Yellow	Positive	1.09	Light pole located west of the process water AST	10 SF
	Bollard	Metal	Yellow	Positive	1.31	Metal bollard located south of the RWP station	5 LF
	2" Handrail	Metal	Yellow	Positive	1.32	Sump metal handrail south of the RWP	50 LF
North Primary Clarifier	Light Pole Base	Concrete	Yellow	Positive	1.98	Light pole located east of the north primary	10 SF

Table 3 – Summary of Confirmed LBP and LCM From Tetra Tech's Lead Survey							
Suite No.	**Component**	**Substrate**	**Color**	**Results**	**Pb (mg/cm^2)**	**Comments**	**Quantity**
						clarifier	
South Primary Clarifier	Stairs	Concrete	Yellow	Positive	4.47	Concrete stairs located north of the south primary clarifier	30 SF
Abandon Primary Digester (APD) AST	Bollard	Metal	Yellow	Positive	1.74	Metal bollard located west of APD AST	5 LF
Sludge Dewatering Building (SDB)	Roof Access Frame	Metal	Yellow	Positive	1.24	Roof access metal frame	30 SF
	Stairs	Metal	Yellow	Positive	3.68	Concrete stairs with metal treads located south of SDB	50 SF
South Aeration	Stair Handrail	Metal	Yellow	Positive	1.33	Metal handrail located north of South Aeration	40 SF
Secondary Clarifier	12" Pipe	Metal	Beige	Positive	3.77	Metal pipe north of the south aeration	180 LF
	12" Pipe	Metal	Beige	Positive	3.74	Metal pipe east of the south aeration	180 LF
	Light Pole Base	Concrete	Yellow	Positive	3.42	Light pole located south of the secondary clarifier	10 SF
	12" Pipe	Metal	Beige	Positive	2.62	Metal pipe south of the south aeration	180 LF
	4" Pipe	Metal	Beige	Positive	1.48	4" metal pipe support south of the south aeration	60 LF
	4" Pipe	Metal	Beige	Positive	2.53	4" metal pipe support south of the south aeration	60 LF
Headworks Building	Bollard	Metal	Yellow	Positive	1.94	Metal bollard located north of the headworks building	30 LF
	Bollard	Metal	Yellow	Positive	2.71	Metal bollard located north of the headworks building	30 LF
South Pacific Pump Station	Stairs	Concrete	Yellow	Positive	1.99	Yellow paint on concrete stairs in basement	40 SF
	Electric Panel	Metal	Yellow	Positive	1.57	Electric panel located south of the south pacific pump station	50 SF

Notes:
LF = linear foot
mg/cm^2 = milligrams per square centimeter
Pb = lead
SF = square foot

Table 3 – Summary of Confirmed LBP and LCM From Tetra Tech's Lead Survey							
Suite No.	**Component**	**Substrate**	**Color**	**Results**	**Pb (mg/cm^2)**	**Comments**	**Quantity**
AST = aboveground storage tank							

Tetra Tech offers the following recommendations regarding LBP and LCM at the Site:

1. Confirmed LBP and LCM, as indicated by the XRF results summarized in Table 3 above, should be removed by a licensed, lead abatement/removal contractor prior to renovation/demolition activities.

2. The confirmation samples were tested for lead by AAS. Lead was detected in three confirmation samples (refer to Table 2).

3. Lead hazards should be remediated by a qualified lead abatement/removal contractor. All lead abatement/removal work should be supervised by CDPH-certified personnel, and work should be completed using appropriate lead work practices in accordance with California Occupational Safety and Health Administration (Cal-OSHA) and HUD guidelines.

4. All lead-related demolition work should be conducted in compliance with the Cal-OSHA standard *California Code of Regulations* (CCR) Title 8 § 1532.1. Manual demolition of lead-containing building components is considered a low-level trigger task whereby exposures exceeding 50 and up to 500 micrograms per cubic meter ($\mu g/m^3$) of lead can be expected. All workers performing a trigger task must follow Cal-OSHA requirements, including use of hand washing facilities, use of High-Efficiency Particulate Air (HEPA) filtered vacuums, blood lead testing prior to the project, training in the Cal-OSHA standard, and use of regulated work areas. Additionally, if a trigger task is undertaken, an exposure assessment must be completed for each type of project work. Employees are required to wear respirators until a negative exposure assessment is completed on the project and, if respirators are used, the contractor must have a written respirator protection plan in place. Painted surfaces that contain levels of lead below 1 mg/cm^2 may be sources of lead contamination if paint is turned into dust by abrasion, scraping, or sanding.

5. All work at the Site, where LBP or LCP is likely to be disturbed, should be performed by a contractor trained and qualified to conduct lead-related construction work. Any work to remediate a lead hazard should be performed by CDPH-certified personnel employing lead work practices in accordance with HUD guidelines.

6. Contractors should employ HUD-developed, lead-safe work practices if lead-coated surfaces are to be impacted or disturbed. In general, "lead-safe work practices" would include methods for: controlling lead dust; properly controlling, collecting, and disposing of lead waste; worker training, monitoring, and protection; and environmental monitoring.

7. Contractors whose employees disturb more than 100 square feet (ft^2) of LBP are required to submit written notification to Cal-OSHA (per Health and Safety Code, Title 17, CCR Section 36000 (c)). Cal-OSHA requires 24-hour advance notice prior to LBP disturbance.

8. This report should be kept by the owner and all future owners for the life of the building.

9. Contractors whose employees work at this Site are required to assess if their work will be subject to the requirements of the Cal-OSHA lead construction standard (CCR Title 8 § 1532). Cal-OSHA standards are designed to regulate and enforce on-the-job worker safety. Employers are required by law to ensure that employees are not exposed to airborne lead levels that exceed the permissible exposure limit.

10. To determine disposal options for the lead-containing surfaces during renovation/demolition activities, bulk samples of the lead-containing surfaces as a whole (i.e., glaze and tile substrate) should be collected and analyzed for total lead according to USEPA Method 3050B/7420.

FIGURES



SOURCE:

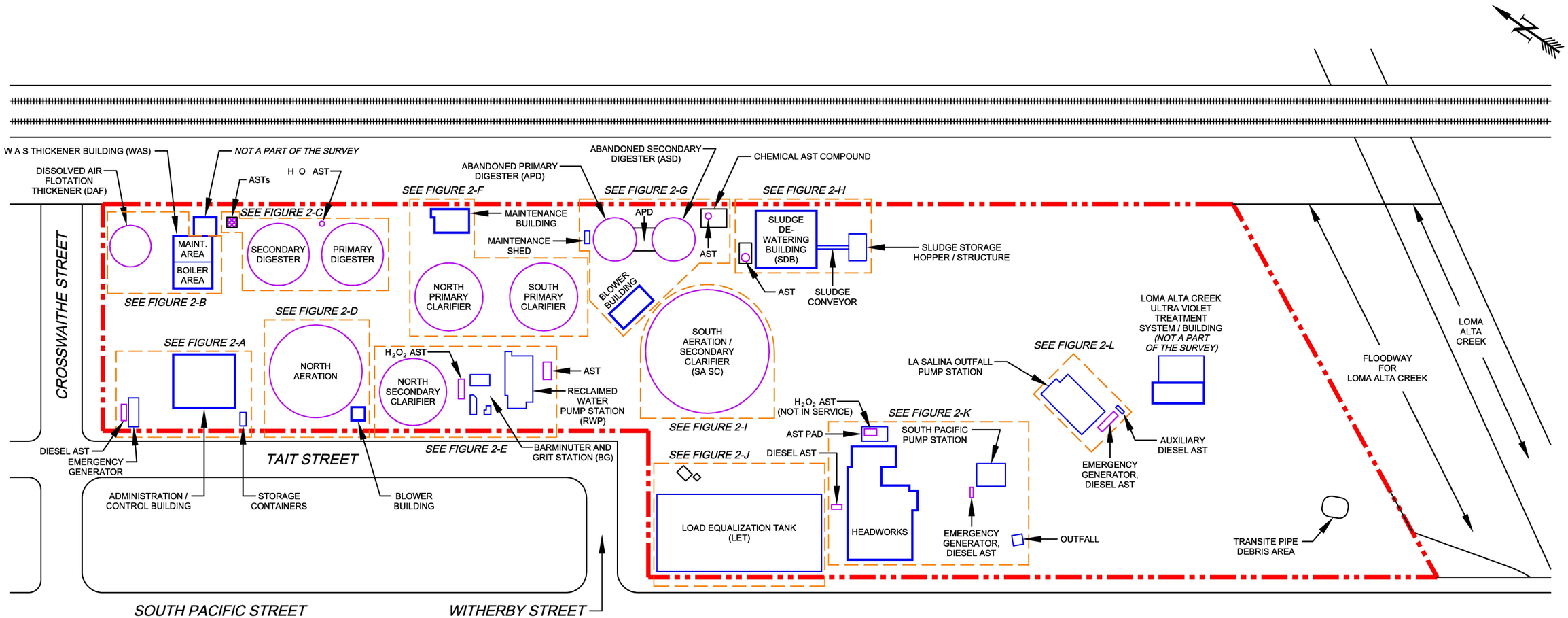
2013 AERIAL PHOTOGRAPH (ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE)

0 200 400

SCALE (FEET)

N

CITY OF OCEANSIDE LA SALINA WASTEWATER TREATMENT PLANT 1330 SOUTH TAIT STREET OCEANSIDE, CALIFORNIA 92054	TETRA TECH DECEMBER 30, 2015 TETRA TECH PROJ. NO. T35149	SITE LOCATION MAP FIGURE 1



LEGEND

SITE BOUNDARY	
AST	ABOVEGROUND STORAGE TANK
H_2O_2	HYDROGEN PEROXIDE
UST	UNDERGROUND STORAGE TANK
RAILROAD TRACK	

0 100 200

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP AND SITE BOUNDARIES DERIVED FROM SAN DIEGO COUNTY ASSESSOR'S MAP; SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010); AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

CITY OF OCEANSIDE
LA SALINA WASTEWATER TREATMENT PLANT
1330 SOUTH TAIT STREET
OCEANSIDE, CALIFORNIA 92054

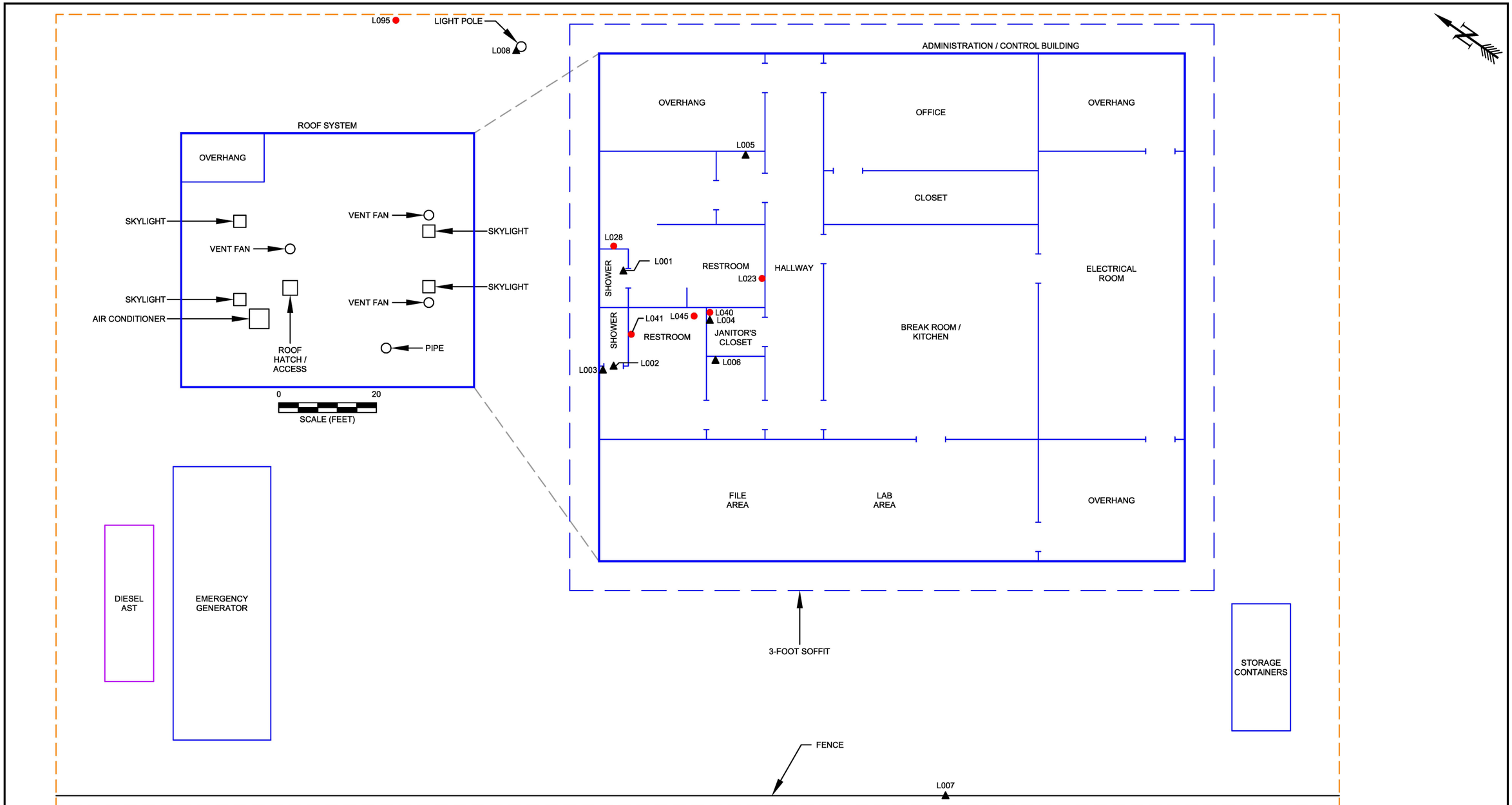
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP

FIGURE 2



LEGEND

AST	ABOVEGROUND STORAGE TANK
L001 ▲	SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
L023 ●	X-RAY FLUORESCENCE (XRF) ANALYZER READING POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)

0 10 20
SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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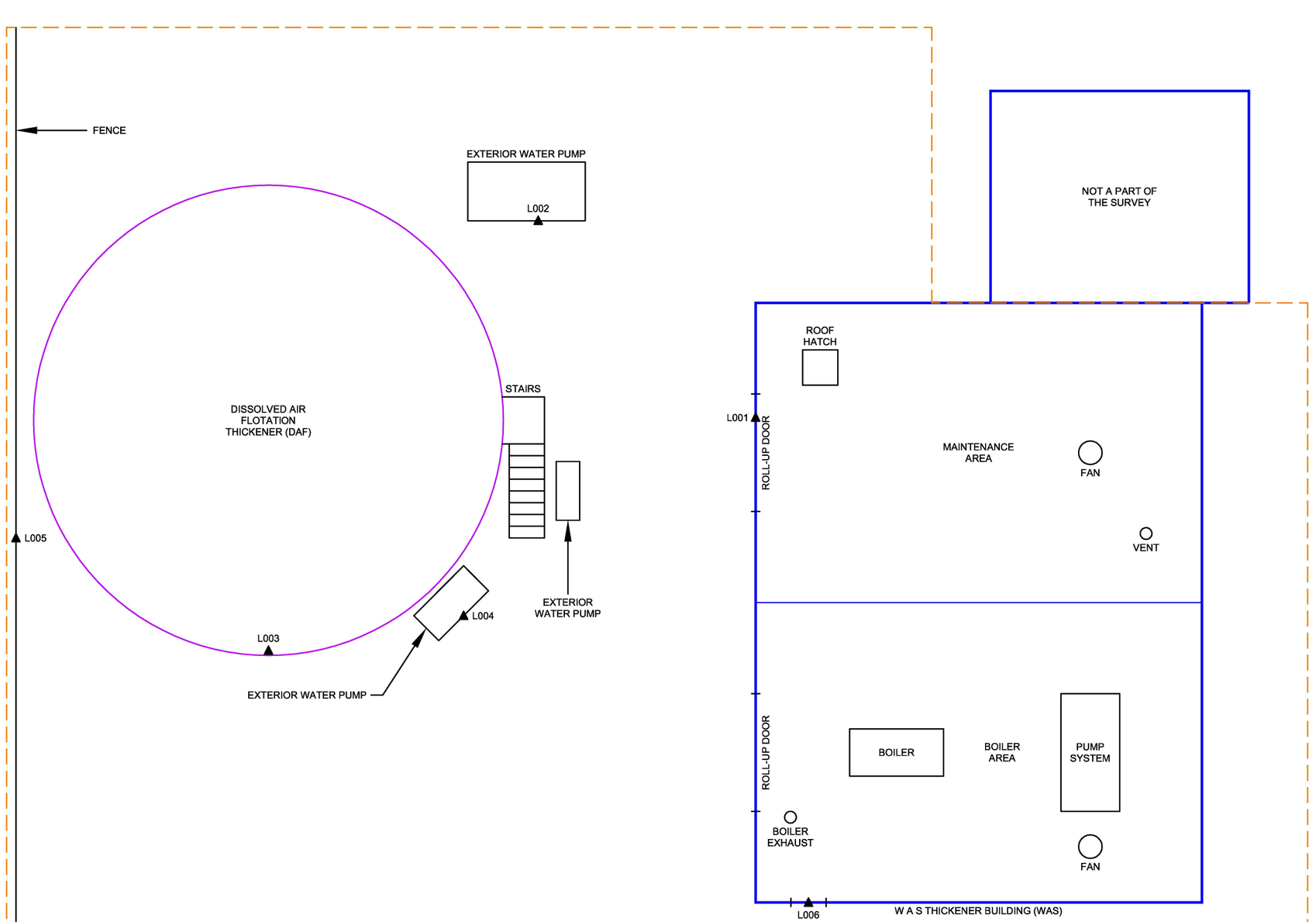
DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - ADMINISTRATION BUILDING

FIGURE 2-A



LEGEND

L001 ▲ SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

0 10 20
SCALE (FEET)

CITY OF OCEANSIDE
LA SALINA WASTEWATER TREATMENT PLANT
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OCEANSIDE, CALIFORNIA 92054

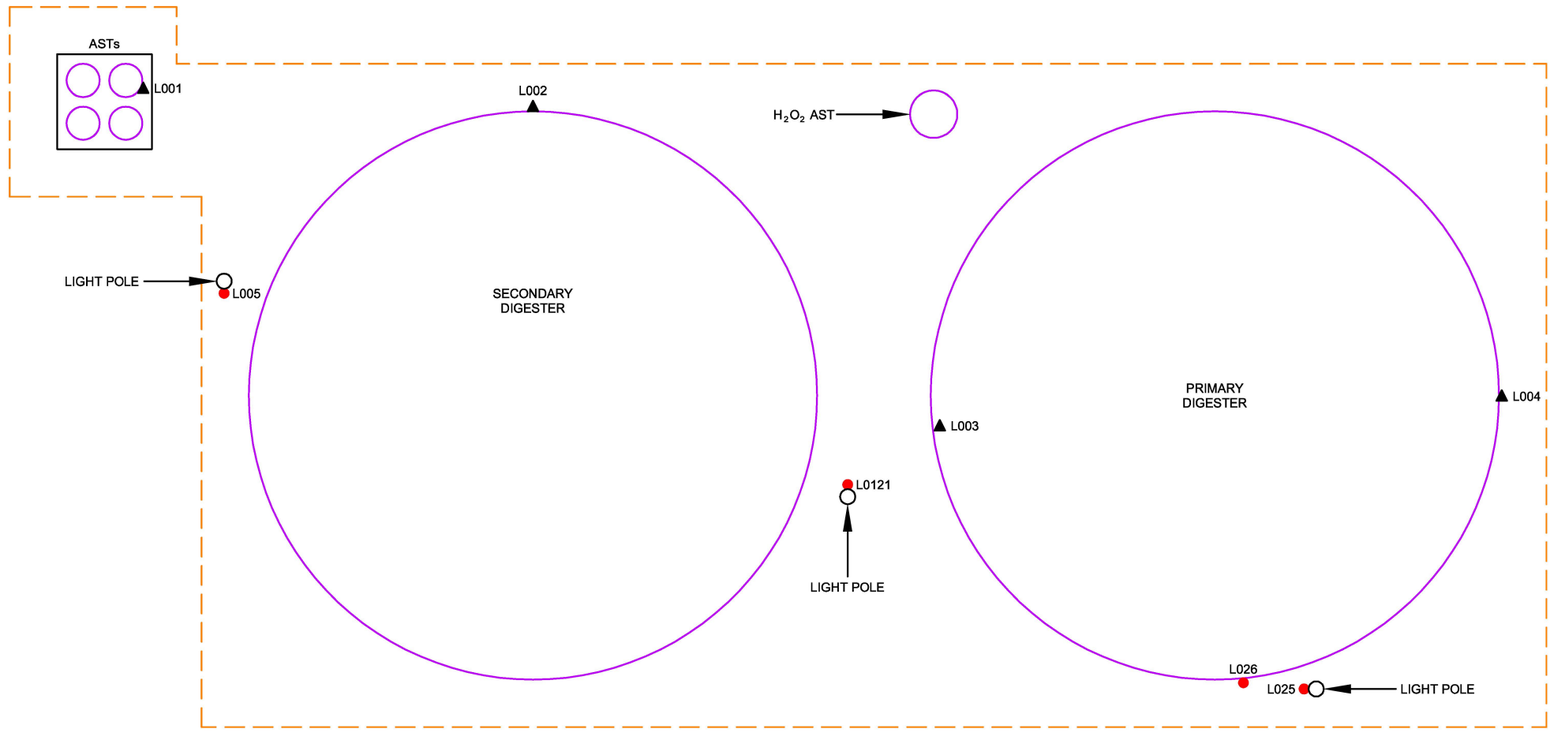
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - DAF SYSTEM AND WAS BUILDING

FIGURE 2-B



LEGEND

AST	ABOVEGROUND STORAGE TANK
H_2O_2	HYDROGEN PEROXIDE
L001 ▲	SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
L005 ●	X-RAY FLUORESCENCE (XRF) ANALYZER READING POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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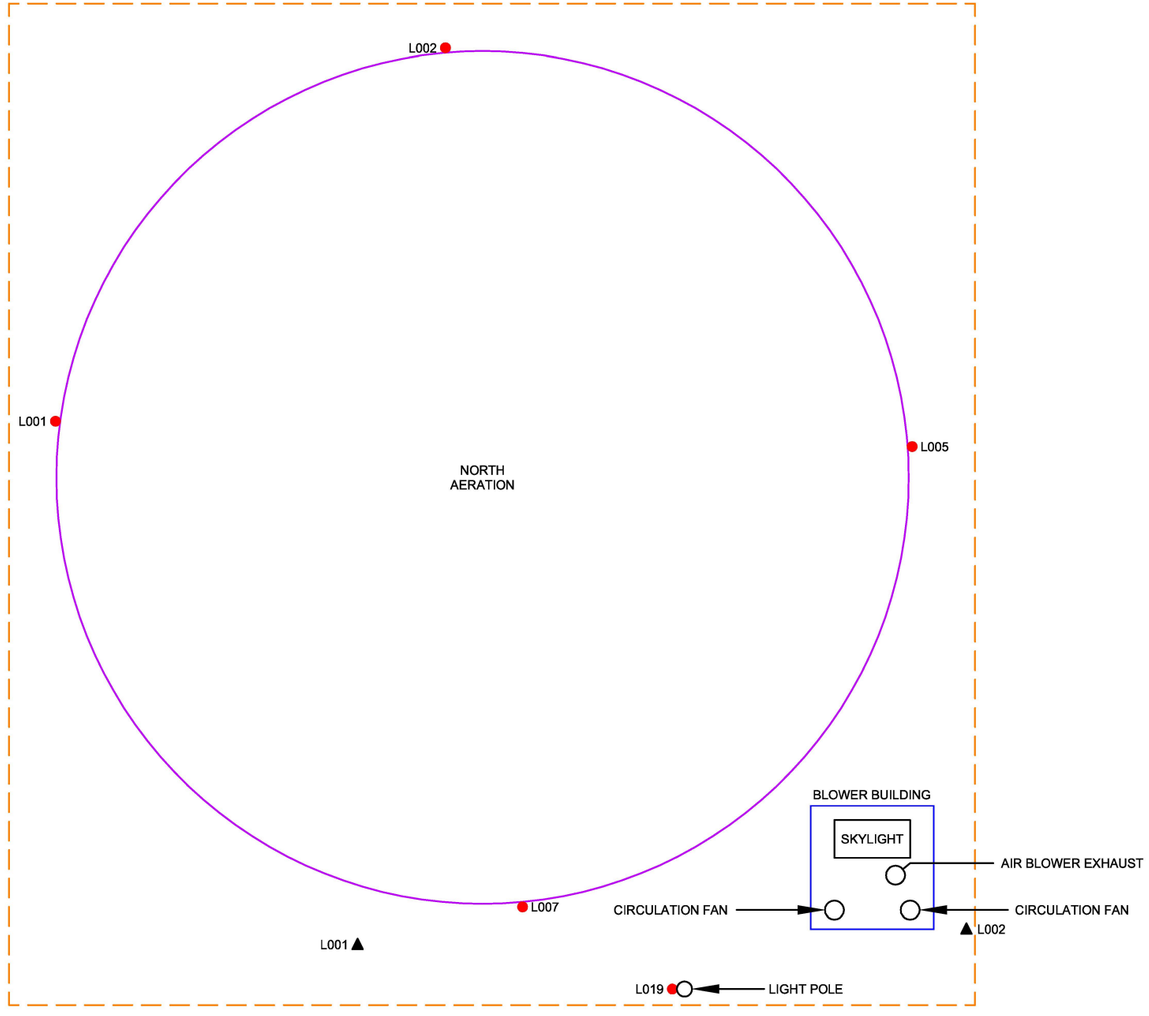
DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - PRIMARY AND SECONDARY DIGESTERS

FIGURE 2-C



LEGEND

L001 ▲	SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
L002 ●	X-RAY FLUORESCENCE (XRF) ANALYZER READING POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

0 16 32

SCALE (FEET)

CITY OF OCEANSIDE
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OCEANSIDE, CALIFORNIA 92054

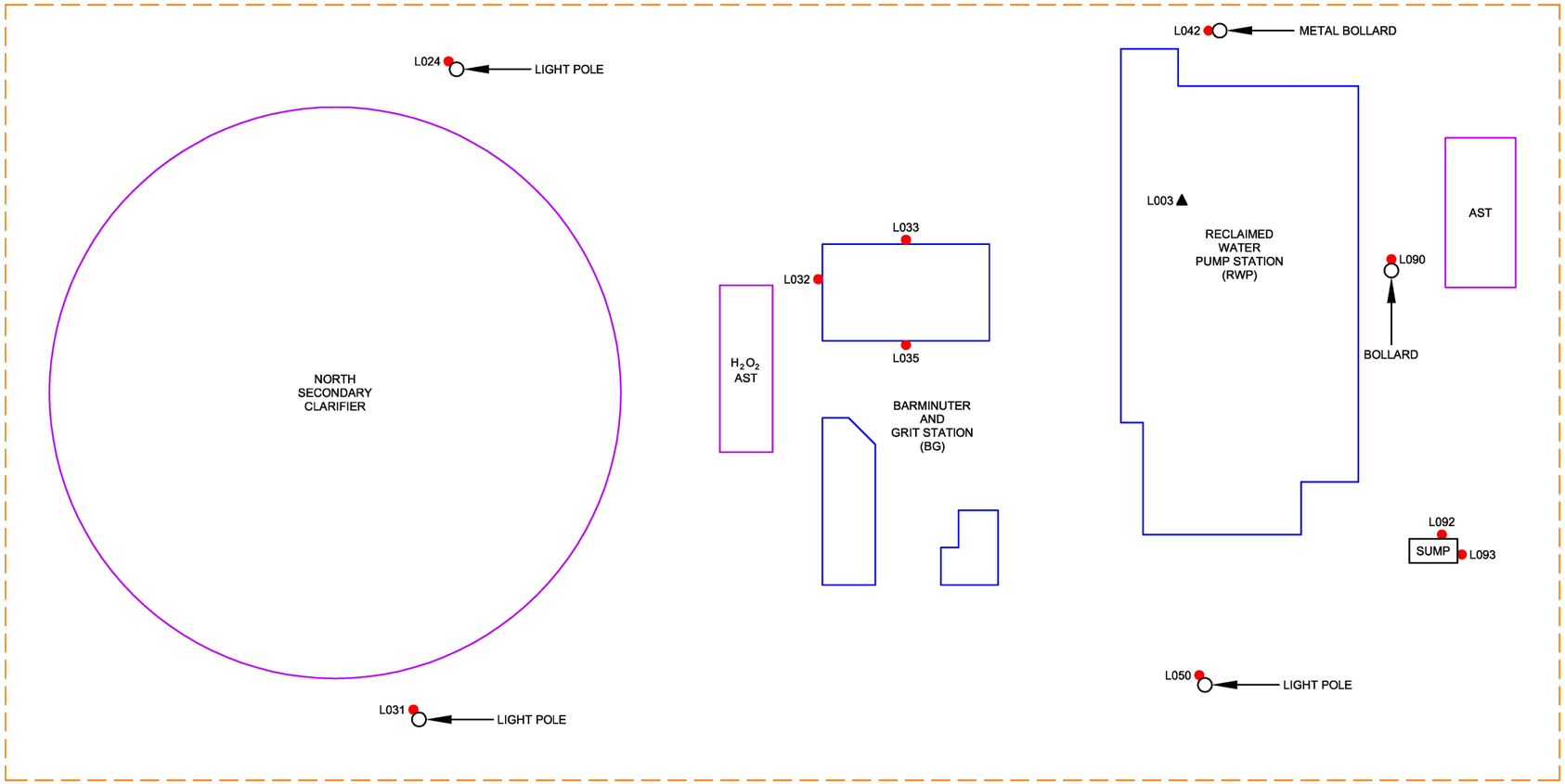
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - NORTH AERATION AREA

FIGURE 2-D



LEGEND

AST	ABOVEGROUND STORAGE TANK
H_2O_2	HYDROGEN PEROXIDE
L003 ▲	SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
L024 ●	X-RAY FLUORESCENCE (XRF) ANALYZER READING POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)

0 16 32
SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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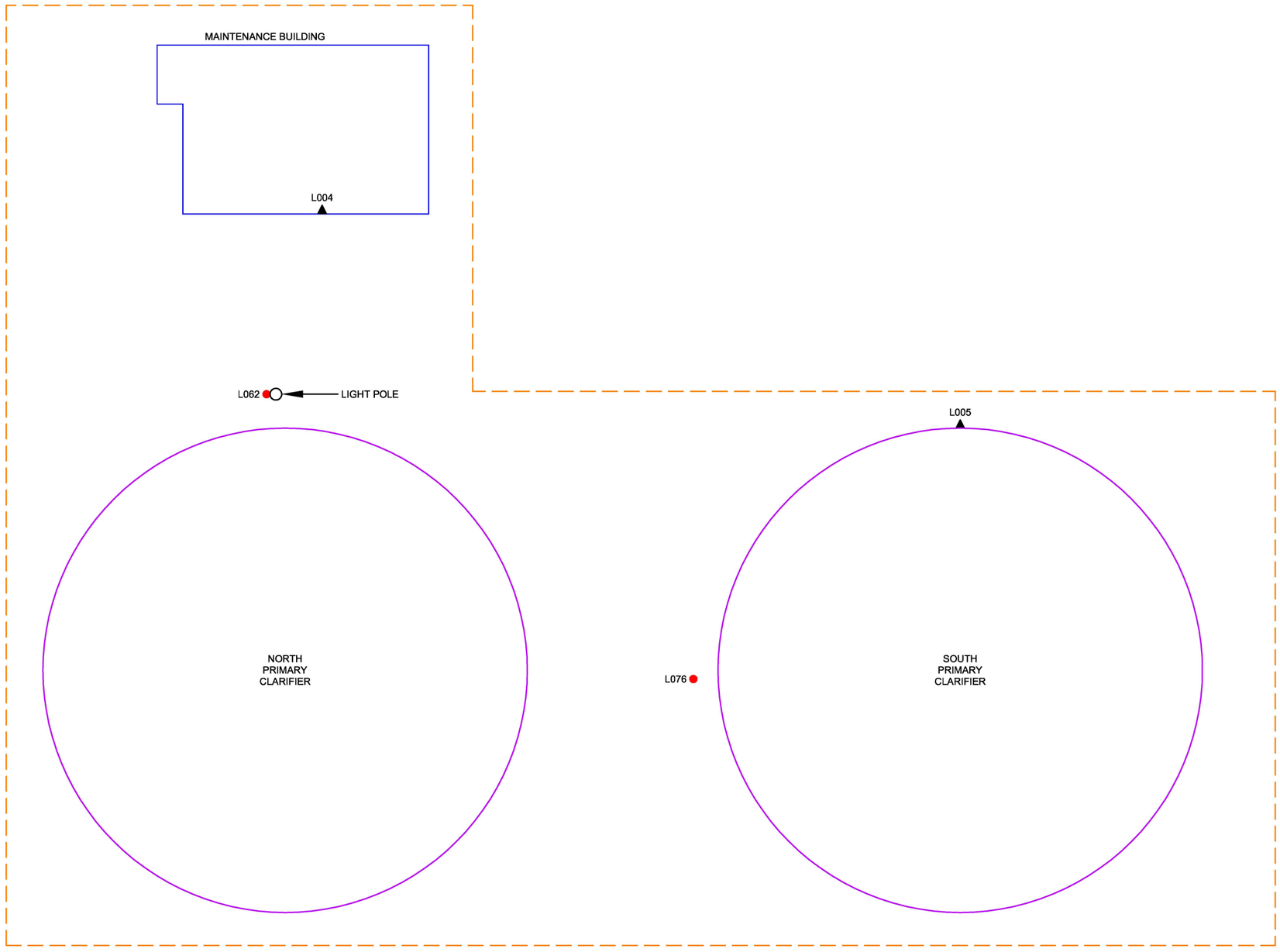
TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - NORTH SECONDARY CLARIFIER, BG, AND RWP AREAS

FIGURE 2-E



LEGEND

L004 ▲ SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

L062 ● X-RAY FLUORESCENCE (XRF) ANALYZER READING POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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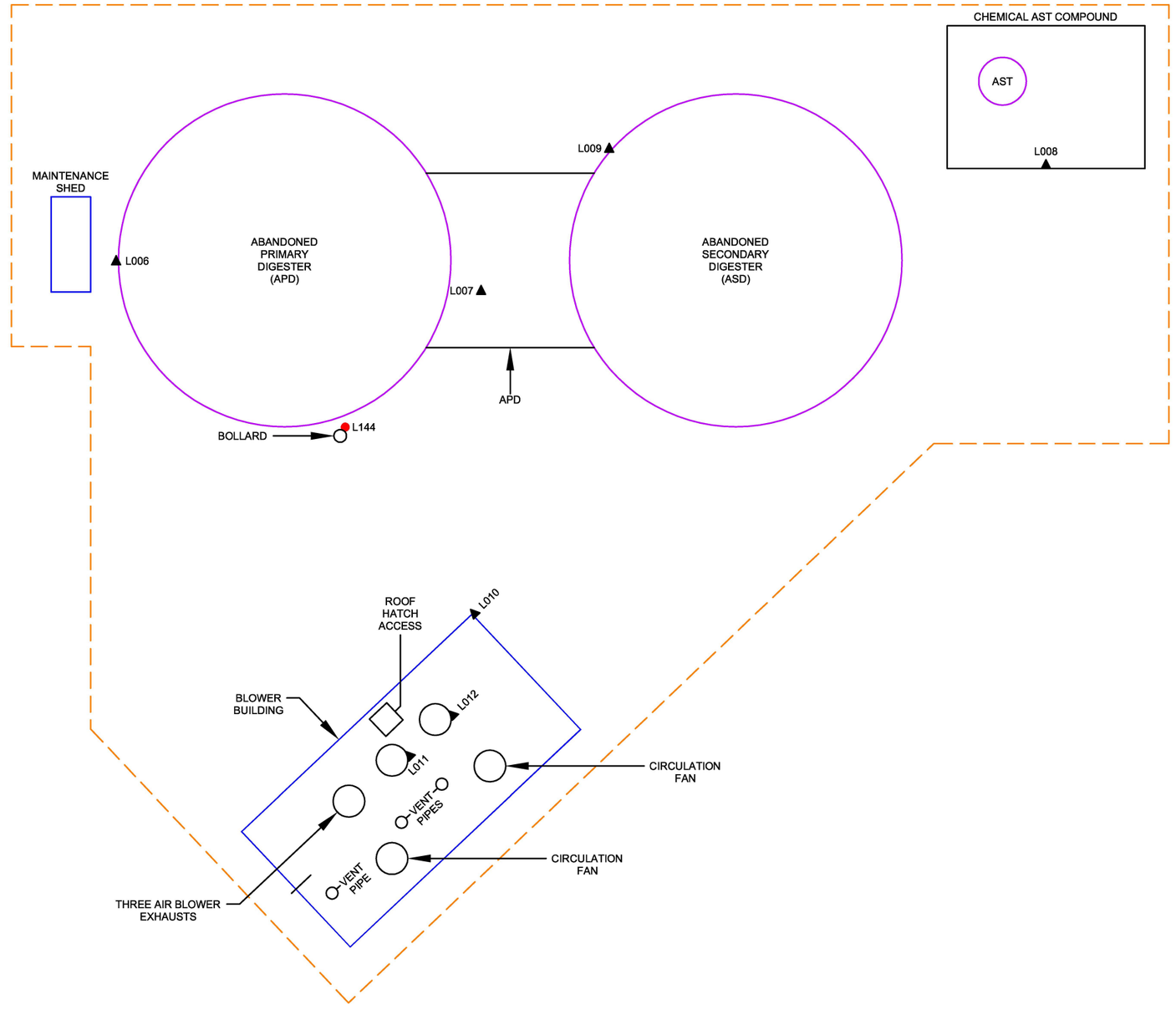
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - MAINTENANCE BUILDING AND NORTH AND SOUTH PRIMARY CLARIFIERS AREAS

FIGURE 2-F



LEGEND

AST	ABOVEGROUND STORAGE TANK
L006 ▲	SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
L144 ●	X-RAY FLUORESCENCE (XRF) ANALYZER READING POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

CITY OF OCEANSIDE
LA SALINA WASTEWATER TREATMENT PLANT
1330 SOUTH TAIT STREET
OCEANSIDE, CALIFORNIA 92054

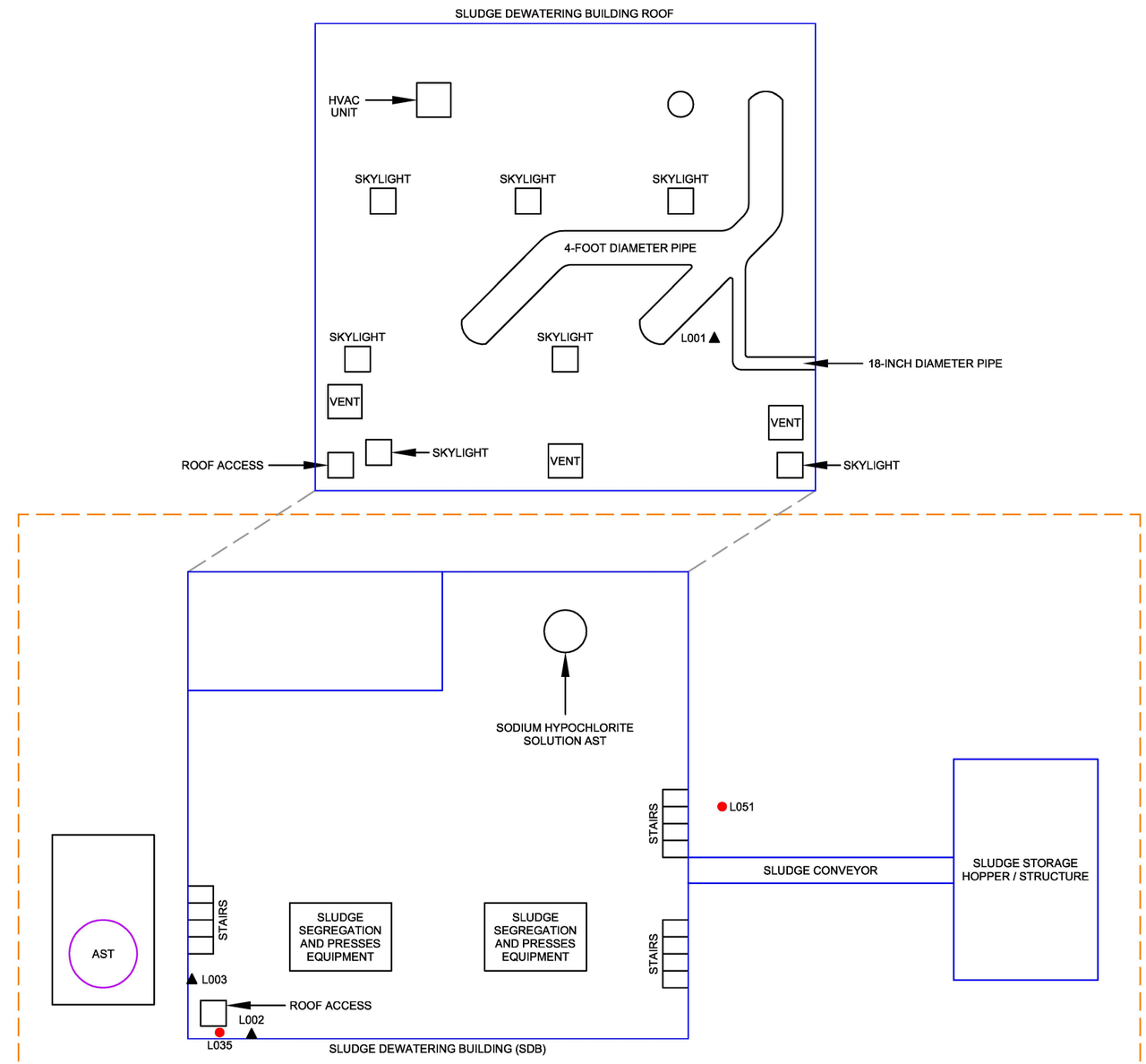
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - BLOWER BUILDING AND APD AND ASD AREAS

FIGURE 2-G



LEGEND

AST	ABOVEGROUND STORAGE TANK
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
L001 ▲	SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
L035 ●	X-RAY FLUORESCENCE (XRF) ANALYZER READING POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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OCEANSIDE, CALIFORNIA 92054

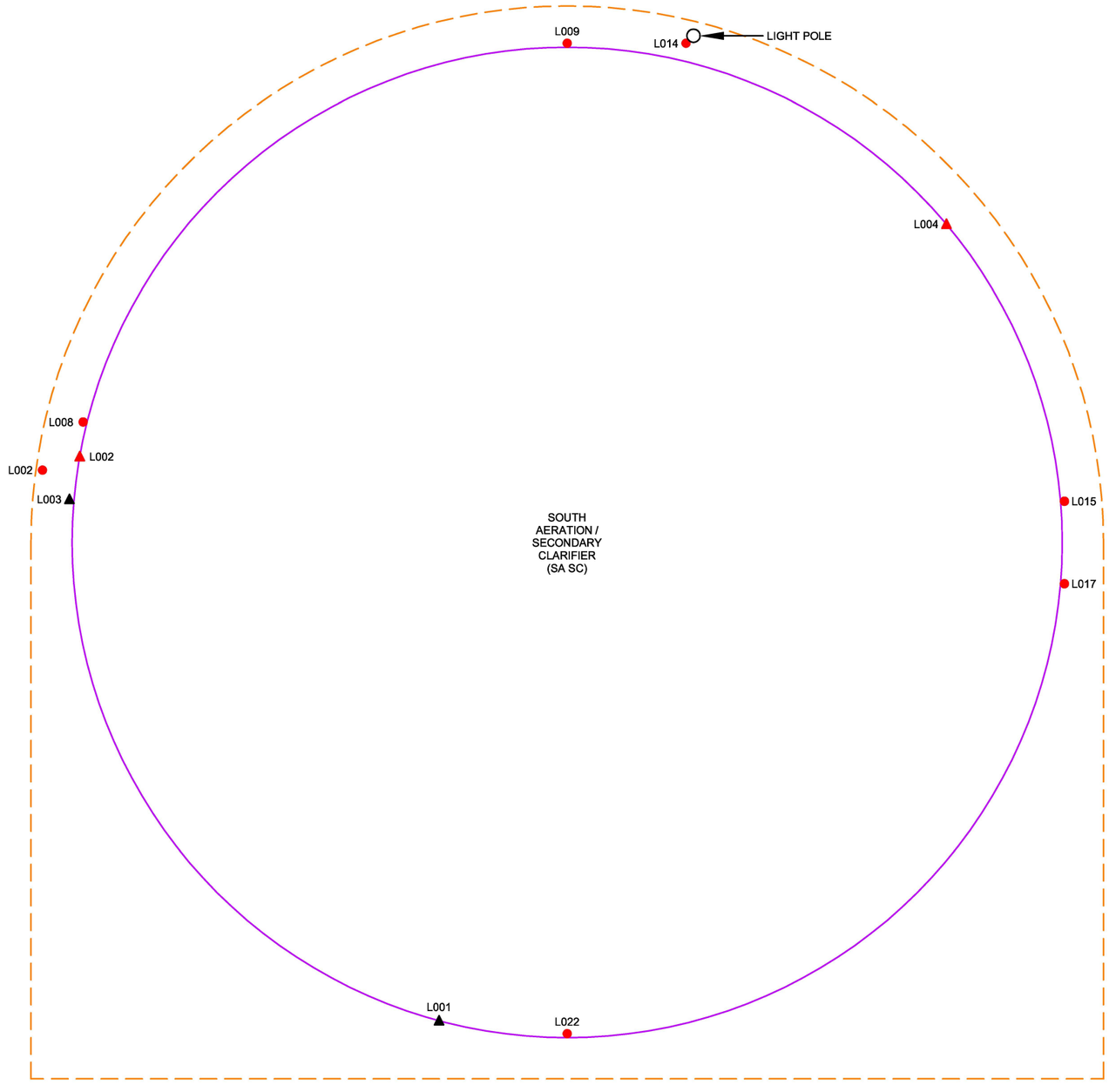
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - SDB BUILDING

FIGURE 2-H



LEGEND

L001 ▲	SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
L002 ▲	CHIP SAMPLE TESTED POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)
L008 ●	X-RAY FLUORESCENCE (XRF) ANALYZER READING POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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OCEANSIDE, CALIFORNIA 92054

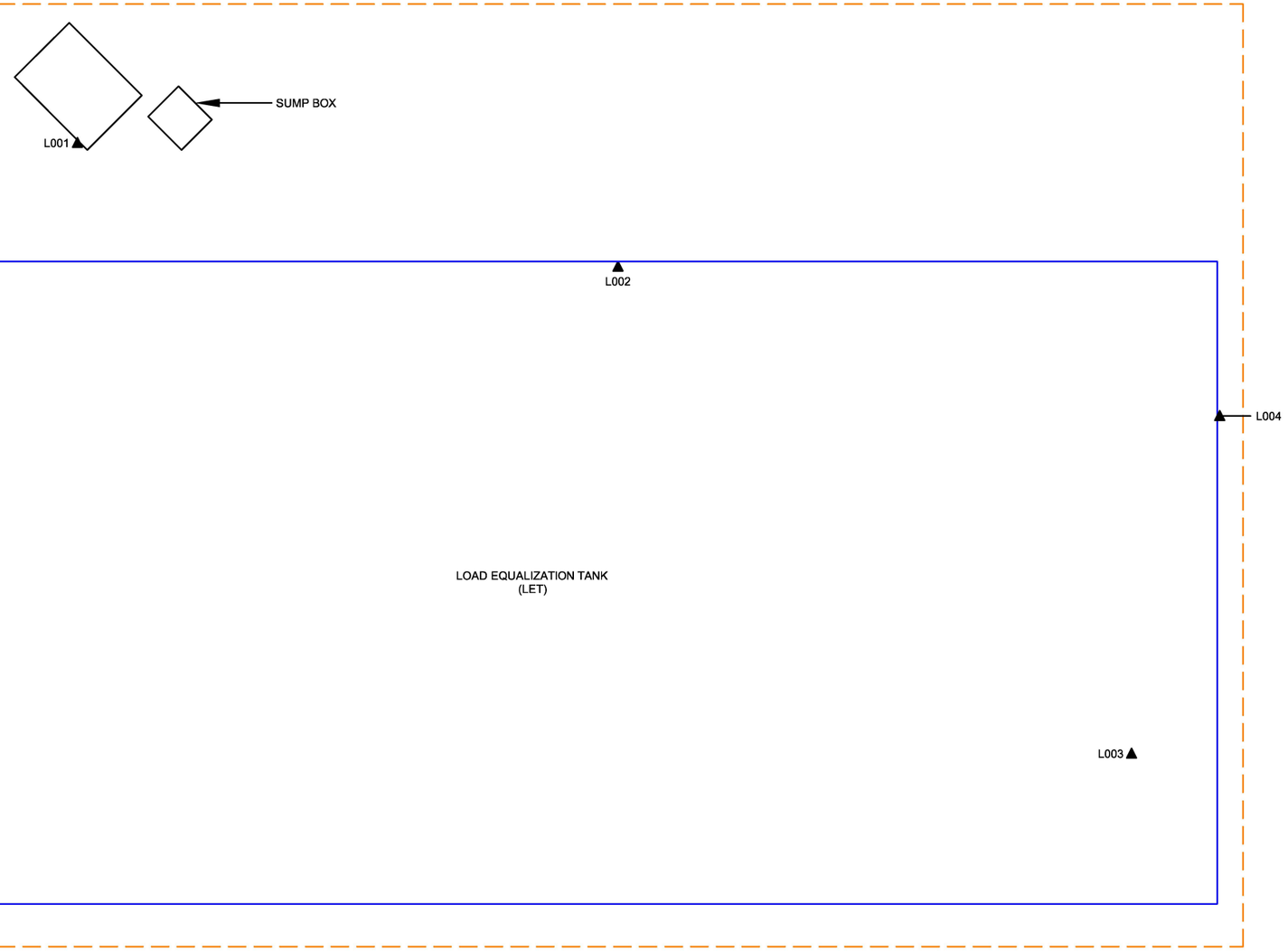
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - SA SC AREA

FIGURE 2-I



LEGEND

L001 ▲ SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

0 16 32
SCALE (FEET)

CITY OF OCEANSIDE
LA SALINA WASTEWATER TREATMENT PLANT
1330 SOUTH TAIT STREET
OCEANSIDE, CALIFORNIA 92054

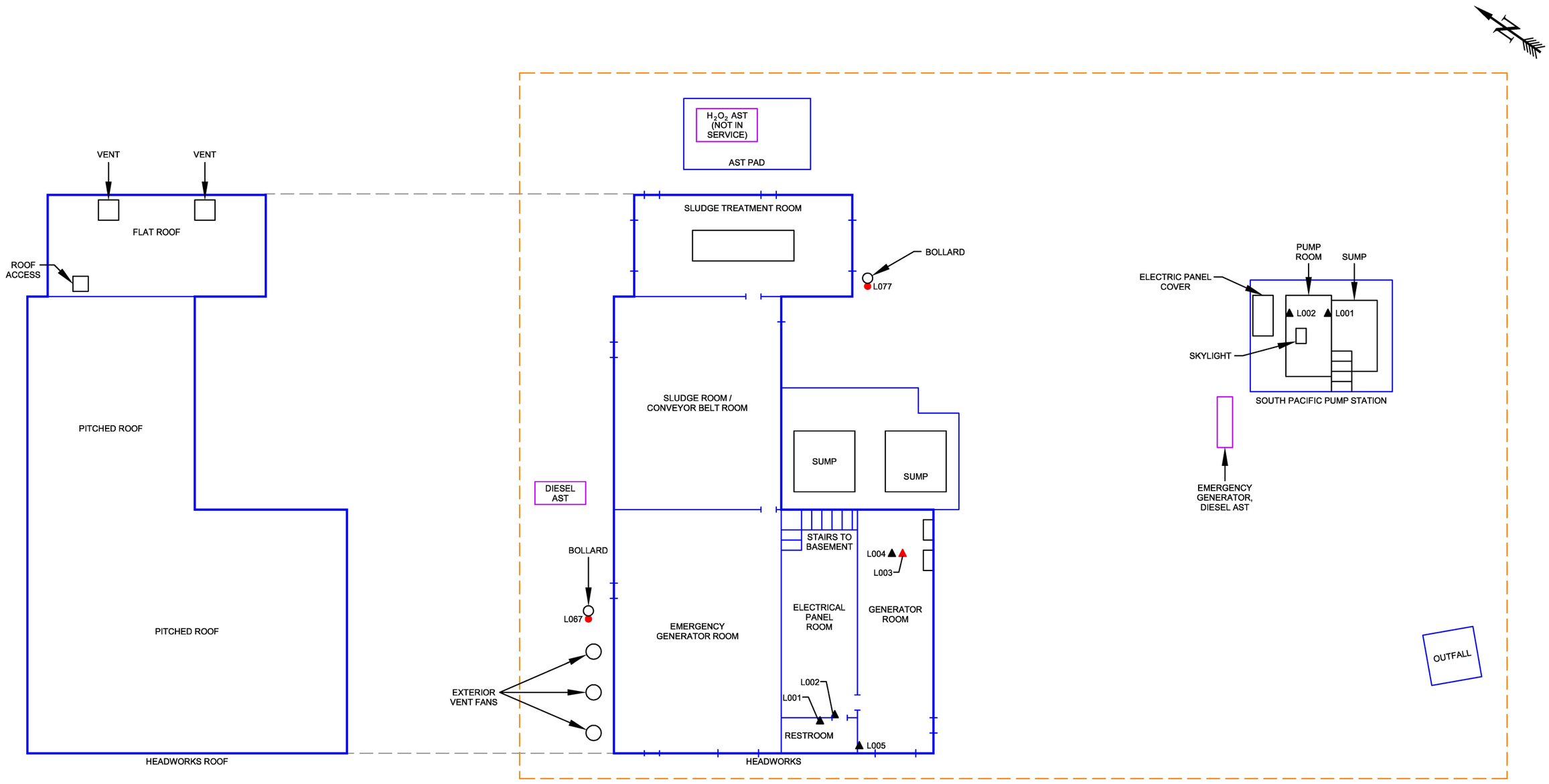
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - LET AREA

FIGURE 2-J



LEGEND

AST	ABOVEGROUND STORAGE TANK
L001 ▲	SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
L003 ▲	CHIP SAMPLE TESTED POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)
L067 ●	X-RAY FLUORESCENCE (XRF) ANALYZER READING POSITIVE FOR LEAD (WITH SAMPLE DESIGNATION)

0 20 40

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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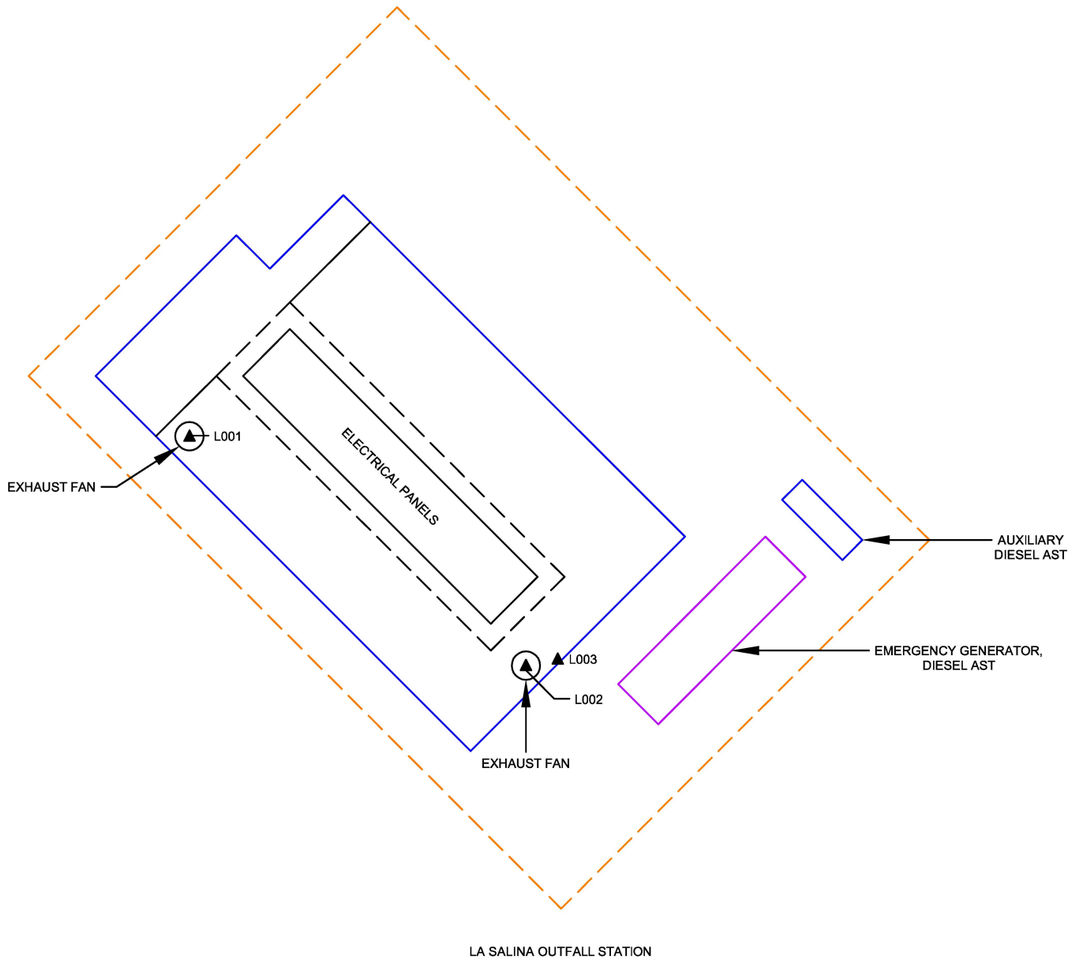
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - HEADWORKS BUILDING AND SOUTH PACIFIC PUMP STATION AREA

FIGURE 2-K



LEGEND

AST	ABOVEGROUND STORAGE TANK
L001 ▲	SUSPECT LEAD-BASED PAINT (LBP) CHIP SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT LBP SAMPLE LOCATIONS - LA SALINA OUTFALL STATION

FIGURE 2-L

APPENDIX A

SURVEY TEAM CERTIFICATIONS

APPENDIX B

X-RAY FLUORESCENCE READINGS DATA

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
1	11/16/2015 7:40	Quantify Lead Paint	20.89	mg / cm ^2	Final	Positive	1.13	0.7							Calibration	1.08
2	11/16/2015 7:42	Quantify Lead Paint	32.49	mg / cm ^2	Final	Positive	1.1	0.7							Calibration	0.88
3	11/16/2015 7:43	Quantify Lead Paint	23.29	mg / cm ^2	Final	Positive	1.09	0.7							Calibration	0.94
4	11/16/2015 7:44	Quantify Lead Paint	23.99	mg / cm ^2	Final	Negative	6.18	0.7							Calibration	<LOD
5	11/16/2015 7:46	Quantify Lead Paint	31.2	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
6	11/16/2015 7:47	Quantify Lead Paint	31.99	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
7	11/17/2015 7:39	Quantify Lead Paint	19.47	mg / cm ^2	Final	Positive	1.09	0.7							Calibration	0.88
8	11/17/2015 7:40	Quantify Lead Paint	20.97	mg / cm ^2	Final	Positive	1.13	0.7							Calibration	1.07
9	11/17/2015 7:41	Quantify Lead Paint	20.52	mg / cm ^2	Final	Positive	1.09	0.7							Calibration	1.02
10	11/17/2015 7:42	Quantify Lead Paint	20.87	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
11	11/17/2015 7:42	Quantify Lead Paint	20.61	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
12	11/17/2015 7:43	Quantify Lead Paint	20.49	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
13	11/17/2015 7:50	Quantify Lead Paint	20.96	mg / cm ^2	Final	Negative	1.59	0.7	wall	concrete	a	yellow	e. office	Administration		0.09
14	11/17/2015 7:55	Quantify Lead Paint	20.75	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	a	tan				<LOD
15	11/17/2015 7:56	Quantify Lead Paint	20.77	mg / cm ^2	Final	Negative	1.21	0.7	door	metal	a	tan				0.02
16	11/17/2015 7:57	Quantify Lead Paint	20.54	mg / cm ^2	Final	Negative	1.02	0.7	wall	drywall	b	yellow				0.02
17	11/17/2015 7:58	Quantify Lead Paint	21.21	mg / cm ^2	Final	Negative	1	0.7	window jamb	wood	b	brown				<LOD
18	11/17/2015 7:59	Quantify Lead Paint	19.69	mg / cm ^2	Final	Negative	1	0.7	window	metal	b	white				<LOD
19	11/17/2015 7:59	Quantify Lead Paint	20.14	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	c	yellow				0.02
20	11/17/2015 8:00	Quantify Lead Paint	20.61	mg / cm ^2	Final	Negative	1	0.7	window jamb	wood	c	brown				<LOD
21	11/17/2015 8:01	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	window	metal	c	white				<LOD
22	11/17/2015 8:01	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1.47	0.7	wall	concrete	d	yellow				0.07
23	11/17/2015 8:02	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	d	tan				<LOD
24	11/17/2015 8:02	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1.09	0.7	door	metal	d	tan				0.03
25	11/17/2015 8:03	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1.38	0.7	wall	drywall	a	yellow				0.06
26	11/17/2015 8:04	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	window jamb	wood	a	brown	hallway			<LOD
27	11/17/2015 8:05	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	window	metal	a	brown				<LOD
28	11/17/2015 8:06	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	door jamb	wood	a	tan				<LOD
29	11/17/2015 8:06	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	brown				<LOD
30	11/17/2015 8:08	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	a	tan	janitor closet			<LOD
31	11/17/2015 8:09	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	tan				0.02
32	11/17/2015 8:09	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1.67	0.7	wall	drywall	b	yellow	hallway			0.05
33	11/17/2015 8:10	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1.55	0.7	wall	concrete	c	yellow				0.07
34	11/17/2015 8:12	Quantify Lead Paint	9.98	mg / cm ^2	Final	Negative	1.18	0.7	wall	drywall	d	yellow				0.03
35	11/17/2015 8:13	Quantify Lead Paint	10.31	mg / cm ^2	Final	Positive	1.95	0.7	wall	4" ceramic tile	a	pink/beige	e. restroom			9.09
36	11/17/2015 8:15	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	1.02	0.7	lockers	metal	a	brown				0.41
37	11/17/2015 8:17	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	floor	1" ceramic	e	grey	shower			<LOD
38	11/17/2015 8:19	Quantify Lead Paint	10.79	mg / cm ^2	Final	Negative	1	0.7	wall	4" ceramic	a	white				<LOD
39	11/17/2015 8:20	Quantify Lead Paint	10.63	mg / cm ^2	Final	Negative	1.02	0.7	lockers	metal	b	brown				0.28
40	11/17/2015 8:21	Quantify Lead Paint	10.57	mg / cm ^2	Final	Positive	2	0.7	wall	4" ceramic	b	brown				8.49
41	11/17/2015 8:21	Quantify Lead Paint	10.57	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	b	yellow				0.02
42	11/17/2015 8:22	Quantify Lead Paint	10.69	mg / cm ^2	Final	Negative	1.44	0.7	wall	concrete	c	yellow				0.07
43	11/17/2015 8:23	Quantify Lead Paint	10.56	mg / cm ^2	Final	Positive	1.91	0.7	wall	4" ceramic	c	pink/beige				8.63
44	11/17/2015 8:24	Quantify Lead Paint	14.82	mg / cm ^2	Final	Positive	1.93	0.7	wall	4" ceramic	d	pink/beige				8.7
45	11/17/2015 8:24	Quantify Lead Paint	10.57	mg / cm ^2	Final	Negative	1	0.7	wall	mirror	d	glass				<LOD
46	11/17/2015 8:25	Quantify Lead Paint	10.68	mg / cm ^2	Final	Negative	1	0.7	sink counter	wood laminate	d	white				<LOD
47	11/17/2015 8:26	Quantify Lead Paint	10.34	mg / cm ^2	Final	Negative	1	0.7	sink	metal	d	black				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
48	11/17/2015 8:28	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	floor	2" ceramic	e	beige				<LOD
49	11/17/2015 8:28	Quantify Lead Paint	10.2	mg / cm ^2	Final	Negative	1	0.7	ceiling	drywall	f	yellow				0.02
50	11/17/2015 8:31	Quantify Lead Paint	10.34	mg / cm ^2	Final	Negative	1	0.7	wall	4" ceramic	a	white	janitor closet			<LOD
51	11/17/2015 8:31	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	wall	4" ceramic	b	white				<LOD
52	11/17/2015 8:33	Quantify Lead Paint	11.48	mg / cm ^2	Final	Positive	1.98	0.7	floor	sink	e	white				7.17
53	11/17/2015 8:35	Quantify Lead Paint	10.65	mg / cm ^2	Final	Positive	1.94	0.7	wall	4" ceramic	a	pink/beige	w. restroom			9.21
54	11/17/2015 8:35	Quantify Lead Paint	10.32	mg / cm ^2	Final	Positive	1.93	0.7	wall	4" ceramic	b	pink/beige				8.75
55	11/17/2015 8:36	Quantify Lead Paint	10.65	mg / cm ^2	Final	Negative	1	0.7	wall	mirror	b	glass				<LOD
56	11/17/2015 8:36	Quantify Lead Paint	10.56	mg / cm ^2	Final	Negative	1	0.7	sink counter	wood laminate	b	white				<LOD
57	11/17/2015 8:37	Quantify Lead Paint	10.67	mg / cm ^2	Final	Positive	2.06	0.7	sink	metal	b	white				8.5
58	11/17/2015 8:38	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1.73	0.7	wall	concrete	c	yellow				0.08
59	11/17/2015 8:39	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1.09	0.7	wall	drywall	d	yellow				0.02
60	11/17/2015 8:39	Quantify Lead Paint	10.23	mg / cm ^2	Final	Positive	1.92	0.7	wall	4" ceramic	d	pink/beige				8.86
61	11/17/2015 8:40	Quantify Lead Paint	9.99	mg / cm ^2	Final	Negative	1	0.7	lockers	metal	d	bluish				<LOD
62	11/17/2015 8:41	Quantify Lead Paint	10.21	mg / cm ^2	Final	Negative	1.13	0.7	lockers	metal	d	brown				0.32
63	11/17/2015 8:41	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	floor	2" ceramic	e	beige				<LOD
64	11/17/2015 8:42	Quantify Lead Paint	10.65	mg / cm ^2	Final	Negative	1	0.7	ceiling	drywall	f	yellow				0.03
65	11/17/2015 8:43	Quantify Lead Paint	10.64	mg / cm ^2	Final	Negative	1.39	0.7	wall	concrete	a	yellow	breakroom			0.08
66	11/17/2015 8:43	Quantify Lead Paint	9.85	mg / cm ^2	Final	Negative	2.48	0.7	wall	concrete	b	yellow				0.11
67	11/17/2015 8:44	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1.87	0.7	wall	concrete	c	yellow				0.08
68	11/17/2015 8:44	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1.09	0.7	wall	drywall	d	yellow				0.02
69	11/17/2015 8:45	Quantify Lead Paint	10.78	mg / cm ^2	Final	Negative	1	0.7	sink counter	wood laminate	d	greyish				<LOD
70	11/17/2015 8:46	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	sink	metal	d	white				<LOD
71	11/17/2015 8:47	Quantify Lead Paint	10.78	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	a	white	lab/file room			<LOD
72	11/17/2015 8:47	Quantify Lead Paint	10.68	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	b	white				<LOD
73	11/17/2015 8:48	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	cabinets	metal	b	black				<LOD
74	11/17/2015 8:49	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1.32	0.7	wall	drywall	c	white				0.03
75	11/17/2015 8:49	Quantify Lead Paint	10.45	mg / cm ^2	Final	Negative	1	0.7	door jamb	wood	c	brown				<LOD
76	11/17/2015 8:50	Quantify Lead Paint	10.34	mg / cm ^2	Final	Negative	1	0.7	door	metal	c	brown				<LOD
77	11/17/2015 8:51	Quantify Lead Paint	10.45	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	d	white				<LOD
78	11/17/2015 8:52	Quantify Lead Paint	10.35	mg / cm ^2	Final	Negative	1	0.7	sink counter	metal	d	black				<LOD
79	11/17/2015 8:52	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	sink	metal	d	black				<LOD
80	11/17/2015 8:53	Quantify Lead Paint	10.78	mg / cm ^2	Final	Negative	1.01	0.7	vanity	wood	d	tan				0.05
81	11/17/2015 8:54	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1.24	0.7	wall	concrete	a	yellow	electric room			0.03
82	11/17/2015 8:54	Quantify Lead Paint	10.33	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	a	tan				<LOD
83	11/17/2015 8:55	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	tan				<LOD
84	11/17/2015 8:56	Quantify Lead Paint	10.79	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	b	yellow				<LOD
85	11/17/2015 8:56	Quantify Lead Paint	1.19	mg / cm ^2	Final	Negative	1	0.7	door jamb	wood	b	brown				<LOD
86	11/17/2015 8:56	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	door	wood	b	brown				<LOD
87	11/17/2015 8:57	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	c	yellow				<LOD
88	11/17/2015 8:58	Quantify Lead Paint	10.79	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	d	yellow				0.02
89	11/17/2015 8:58	Quantify Lead Paint	14.61	mg / cm ^2	Final	Negative	1.55	0.7	door jamb	wood	d	brown				0.03
90	11/17/2015 8:59	Quantify Lead Paint	9.87	mg / cm ^2	Final	Negative	1	0.7	door	wood	d	brown				<LOD
91	11/17/2015 8:59	Quantify Lead Paint	10.68	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	a	white	building exterior			<LOD
92	11/17/2015 9:01	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	brown				<LOD
93	11/17/2015 9:02	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	a	tan				<LOD
94	11/17/2015 9:03	Quantify Lead Paint	10.38	mg / cm ^2	Final	Negative	1	0.7	roof sofit	clay	a	reddish				<LOD
95	11/17/2015 9:04	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	b	white				<LOD
96	11/17/2015 9:05	Quantify Lead Paint	10.8	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	c	white				<LOD
97	11/17/2015 9:06	Quantify Lead Paint	13.36	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	d	white				<LOD
98	11/17/2015 9:06	Quantify Lead Paint	10.58	mg / cm ^2	Final	Negative	1	0.7	roof sofit aboveground	wood	d	brown				<LOD
99	11/17/2015 9:16	Quantify Lead Paint	10.79	mg / cm ^2	Final	Negative	1	0.7	storage tank	metal	a	yellow	n. of building			<LOD
100	11/17/2015 9:19	Quantify Lead Paint	10.79	mg / cm ^2	Final	Negative	1	0.7	generator	metal	a	yellow				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
101	11/17/2015 9:20	Quantify Lead Paint	10.35	mg / cm ^2	Final	Negative	1	0.7	bench	wood	a	brown				<LOD
102	11/17/2015 9:21	Quantify Lead Paint	10.46	mg / cm ^2	Final	Negative	1	0.7	BBQ stand	ceramic	a	brown				<LOD
103	11/17/2015 9:22	Quantify Lead Paint	11.13	mg / cm ^2	Final	Negative	1	0.7	BBQ stand	concrete	a	yellow				<LOD
104	11/17/2015 9:23	Quantify Lead Paint	10.69	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	a	grey				<LOD
105	11/17/2015 9:24	Quantify Lead Paint	10.33	mg / cm ^2	Final	Negative	1	0.7	light pole base	concrete	a	yellow				0.52
106	11/17/2015 9:24	Quantify Lead Paint	10.86	mg / cm ^2	Final	Negative	3.12	0.7	fence	metal	a	green				<LOD
107	11/17/2015 9:26	Quantify Lead Paint	10.46	mg / cm ^2	Final	Negative	1	0.7	sidewalk	concrete	b	yellow				1.08
108	11/17/2015 9:28	Quantify Lead Paint	10.8	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	d	grey				<LOD
109	11/17/2015 9:29	Quantify Lead Paint	11.09	mg / cm ^2	Final	Inconclusive	1.2	0.7	fence	metal	d	green				0.66
110	11/17/2015 9:30	Quantify Lead Paint	10.57	mg / cm ^2	Final	Negative	1.63	0.7	fence	metal	d	green				0.35
111	11/17/2015 13:18	Quantify Lead Paint	8.57	mg / cm ^2	Final	Negative	1	0.7	wall	metal	walkway	beige		DAF building		<LOD
112	11/17/2015 13:19	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	floor	cementitious	walkway	grey				<LOD
113	11/17/2015 13:20	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1	0.7	floor	concrete	coating	grey				<LOD
114	11/17/2015 13:22	Quantify Lead Paint	10.9	mg / cm ^2	Final	Negative	1	0.7	floor	concrete	coating	yellow				<LOD
115	11/17/2015 13:24	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	pipe 12"	metal	pipe	white				<LOD
116	11/17/2015 13:25	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	pipe	beige				<LOD
117	11/17/2015 13:26	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	pipe	beige				<LOD
118	11/17/2015 13:27	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	tank	metal	scrubber	white				<LOD
119	11/17/2015 13:28	Quantify Lead Paint	10.55	mg / cm ^2	Final	Negative	1	0.7	shede	metal	shede	beige				<LOD
120	11/17/2015 13:29	Quantify Lead Paint	10.8	mg / cm ^2	Final	Negative	1	0.7	pipe 12"	metal	pipe	beige				<LOD
121	11/17/2015 13:31	Quantify Lead Paint	10.89	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	yellow		WAS building (current maintenance building)		<LOD
122	11/17/2015 13:31	Quantify Lead Paint	12.73	mg / cm ^2	Final	Negative	1	0.7	rollup door	metal	a	beige				0.02
123	11/17/2015 13:32	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	b	yellow				<LOD
124	11/17/2015 13:33	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	cabinets	metal	b	grey				<LOD
125	11/17/2015 13:34	Quantify Lead Paint	10.21	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	yellow				<LOD
126	11/17/2015 13:34	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	door frame	metal	c	tan				<LOD
127	11/17/2015 13:35	Quantify Lead Paint	10.19	mg / cm ^2	Final	Negative	1	0.7	door	metal	c	beige				<LOD
128	11/17/2015 13:35	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	yellow				<LOD
129	11/17/2015 13:37	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	yellow	exterior			<LOD
130	11/17/2015 13:37	Quantify Lead Paint	10.55	mg / cm ^2	Final	Negative	1	0.7	rollup door	metal	a	beige				<LOD
131	11/17/2015 13:38	Quantify Lead Paint	10.19	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	b	yellow				<LOD
132	11/17/2015 13:39	Quantify Lead Paint	9.74	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	yellow				<LOD
133	11/17/2015 13:39	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	yellow				<LOD
134	11/17/2015 13:40	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1.36	0.7	door frame	metal	d	tan				0.03
135	11/17/2015 13:40	Quantify Lead Paint	9.74	mg / cm ^2	Final	Negative	1	0.7	door	metal	d	beige				<LOD
136	11/17/2015 13:43	Quantify Lead Paint	10.69	mg / cm ^2	Final	Negative	1	0.7	pipe 12"	metal	pipe	beige				<LOD
137	11/17/2015 13:43	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	1	0.7	boiler wall	metal	boiler	bluish				<LOD
138	11/17/2015 13:44	Quantify Lead Paint	10.68	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	white				<LOD
139	11/17/2015 13:46	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	b	white				<LOD
140	11/17/2015 13:46	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	white				<LOD
141	11/17/2015 13:47	Quantify Lead Paint	10.29	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	d	white				<LOD
142	11/17/2015 13:48	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	west fence	metal	fence	beige				<LOD
143	11/17/2015 13:50	Quantify Lead Paint	12.73	mg / cm ^2	Final	Negative	1.59	0.7	north fence	metal	fence	green	north fence			0.33
144	11/18/2015 7:44	Quantify Lead Paint	20.54	mg / cm ^2	Final	Positive	1.14	0.7							Calibration	1.02
145	11/18/2015 7:45	Quantify Lead Paint	20.61	mg / cm ^2	Final	Positive	1.15	0.7							Calibration	1.11
146	11/18/2015 7:45	Quantify Lead Paint	20.05	mg / cm ^2	Final	Positive	1.14	0.7							Calibration	1.13
147	11/18/2015 7:46	Quantify Lead Paint	20.94	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
148	11/18/2015 7:47	Quantify Lead Paint	20.8	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
149	11/18/2015 7:47	Quantify Lead Paint	20.95	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
150	11/18/2015 7:52	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	tank	metal	a	white		biospark AST		<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
151	11/18/2015 7:53	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	pump	metal	a	beige		secondary digester		<LOD
152	11/18/2015 7:54	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	tank	concrete	a	white				<LOD
153	11/18/2015 7:55	Quantify Lead Paint	10.33	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	a	grey				<LOD
154	11/18/2015 7:56	Quantify Lead Paint	11.46	mg / cm ^2	Final	Positive	1.26	0.7	light pole base	concrete	a	yellow				3.22
155	11/18/2015 7:58	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	tank	concrete	b	white				<LOD
156	11/18/2015 8:00	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	tank	concrete	c	white				<LOD
157	11/18/2015 8:00	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	pipe 15"	metal	c	beige				<LOD
158	11/18/2015 8:01	Quantify Lead Paint	10.87	mg / cm ^2	Final	Negative	1	0.7	pump	metal	c	blue				<LOD
159	11/18/2015 8:02	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	3.07	0.7	stairs	metal	c	beige				0.15
160	11/18/2015 8:03	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	c	grey				<LOD
161	11/18/2015 8:03	Quantify Lead Paint	10.88	mg / cm ^2	Final	Positive	1.77	0.7	light pole base	concrete	c	yellow				2.88
162	11/18/2015 8:04	Quantify Lead Paint	10.4	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	white				<LOD
163	11/18/2015 8:04	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	1.45	0.7	flange cover	metal	d	beige				<LOD
164	11/18/2015 8:05	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	pipe 12"	metal	d	beige				<LOD
165	11/18/2015 8:05	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	2.11	0.7	post	metal	d	yellow				0.06
166	11/18/2015 8:06	Quantify Lead Paint	11.58	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	white		primary digester		<LOD
167	11/18/2015 8:07	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	pipe 12"	metal	a	beige				<LOD
168	11/18/2015 8:08	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	b	white				<LOD
169	11/18/2015 8:09	Quantify Lead Paint	10.68	mg / cm ^2	Final	Negative	1.67	0.7	pipe 12"	metal	b	beige				0.04
170	11/18/2015 8:10	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	pump	metal	c	beige				<LOD
171	11/18/2015 8:13	Quantify Lead Paint	10.16	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	white				<LOD
172	11/18/2015 8:14	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	white				<LOD
173	11/18/2015 8:15	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	d	grey				<LOD
174	11/18/2015 8:15	Quantify Lead Paint	13.08	mg / cm ^2	Final	Positive	2.22	0.7	light pole base	concrete	d	yellow				3.23
175	11/18/2015 8:16	Quantify Lead Paint	10.43	mg / cm ^2	Final	Positive	4.98	0.7	pipe 12"	metal	d	beige				1.9
176	11/19/2015 7:56	Quantify Lead Paint	20.52	mg / cm ^2	Final	Positive	1.13	0.7							Calibration	1.05
177	11/19/2015 7:56	Quantify Lead Paint	20.52	mg / cm ^2	Final	Positive	1.12	0.7							Calibration	1.06
178	11/19/2015 7:57	Quantify Lead Paint	20.51	mg / cm ^2	Final	Positive	1.13	0.7							Calibration	1.1
179	11/19/2015 7:57	Quantify Lead Paint	20.15	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
180	11/19/2015 7:58	Quantify Lead Paint	20.87	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
181	11/19/2015 7:58	Quantify Lead Paint	20.49	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
182	11/19/2015 8:05	Quantify Lead Paint	18.77	mg / cm ^2	Final	Positive	2.71	0.7	pipe	metal	a	beige		north aeration		2.47
183	11/19/2015 8:07	Quantify Lead Paint	10.77	mg / cm ^2	Final	Positive	2.54	0.7	pipe 12	metal	b	beige				4.62
184	11/19/2015 8:07	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	stairs	wood	c	brown				<LOD
185	11/19/2015 8:08	Quantify Lead Paint	11.13	mg / cm ^2	Final	Negative	1.09	0.7	pipe 6"	metal	c	beige				0.02
186	11/19/2015 8:10	Quantify Lead Paint	10.88	mg / cm ^2	Final	Positive	2.58	0.7	pipe 12"	metal	c	beige				4.25
187	11/19/2015 8:11	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	2.77	0.7	pipe 6"	metal	c	beige	s. of north aeration			0.16
188	11/19/2015 8:12	Quantify Lead Paint	10.74	mg / cm ^2	Final	Positive	2.42	0.7	pipe 12"	metal	d	beige				4.14
189	11/19/2015 8:14	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	wall	wood	a	beige		air blower building		<LOD
190	11/19/2015 8:14	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	2.88	0.7	pipe 12"	metal	a	beige				0.1
191	11/19/2015 8:15	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1.38	0.7	pipe 6"	metal	a	beige				0.03
192	11/19/2015 8:16	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1	0.7	wall	wood	b	beige				<LOD
193	11/19/2015 8:16	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1	0.7	wall	wood	c	beige				<LOD
194	11/19/2015 8:17	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	wall	wood	c	white				<LOD
195	11/19/2015 8:17	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1	0.7	elect panel	fiberglass	c	white				<LOD
196	11/19/2015 8:18	Quantify Lead Paint	10.05	mg / cm ^2	Final	Negative	2.61	0.7	pipe 6"	metal	c	beige				0.22
197	11/19/2015 8:18	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1.68	0.7	vault	concrete	c	grey				0.09
198	11/19/2015 8:20	Quantify Lead Paint	10.33	mg / cm ^2	Final	Negative	1	0.7	wall	wood	d	beige				<LOD
199	11/19/2015 8:20	Quantify Lead Paint	10.4	mg / cm ^2	Final	Negative	1.57	0.7	pipe 6"	metal	d	beige				0.06
200	11/19/2015 8:21	Quantify Lead Paint	9.73	mg / cm ^2	Final	Positive	1.71	0.7	light pole base	concrete	d	yellow				1.84
201	11/19/2015 8:22	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	d	grey				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
202	11/19/2015 8:36	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	2.05	0.7	handrail 2"	metal	a	grey		n. secondary clarifier		0.08
203	11/19/2015 8:37	Quantify Lead Paint	11.13	mg / cm ^2	Final	Negative	2.16	0.7	handrail 2"	metal	b	grey				0.09
204	11/19/2015 8:38	Quantify Lead Paint	11.48	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	b	black				<LOD
205	11/19/2015 8:38	Quantify Lead Paint	10.44	mg / cm ^2	Final	Positive	1.81	0.7	light pole base	concrete	b	yellow				1.33
206	11/19/2015 8:38	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1.94	0.7	sump	concrete	b	grey				0.3
207	11/19/2015 8:39	Quantify Lead Paint	10.86	mg / cm ^2	Final	Negative	2.1	0.7	handrail 2"	metal	c	grey				0.18
208	11/19/2015 8:41	Quantify Lead Paint	10.78	mg / cm ^2	Final	Negative	1.62	0.7	handrail 2"	metal	d	grey				0.07
209	11/19/2015 8:42	Quantify Lead Paint	10.4	mg / cm ^2	Final	Negative	1.61	0.7	AST base	metal	a	grey				0.45
210	11/19/2015 8:43	Quantify Lead Paint	11.93	mg / cm ^2	Final	Negative	1	0.7	handrail	metal	b	yellow				<LOD
211	11/19/2015 8:44	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	d	grey				<LOD
212	11/19/2015 8:45	Quantify Lead Paint	10.75	mg / cm ^2	Final	Positive	1.33	0.7	light pole base	concrete	d	yellow				2.13
213	11/19/2015 8:46	Quantify Lead Paint	12.61	mg / cm ^2	Final	Positive	1.96	0.7	handrail	metal	a	yellow		BG chamber		9.17
214	11/19/2015 8:47	Quantify Lead Paint	10.88	mg / cm ^2	Final	Positive	1.83	0.7	handrail	metal	b	yellow				9.24
215	11/19/2015 8:49	Quantify Lead Paint	12.98	mg / cm ^2	Final	Negative	1.92	0.7	handrail	metal	c	yellow				0.06
216	11/19/2015 8:50	Quantify Lead Paint	10.88	mg / cm ^2	Final	Positive	1.82	0.7	handrail	metal	d	yellow				9.03
217	11/19/2015 8:50	Quantify Lead Paint	10.75	mg / cm ^2	Final	Negative	1	0.7	sump	mastic	d	beige				<LOD
218	11/19/2015 8:53	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	elect panel	fiberglass	a	white		RWP station		<LOD
219	11/19/2015 8:54	Quantify Lead Paint	11.12	mg / cm ^2	Final	Negative	1	0.7	pipe 4"	metal	a	blue				<LOD
220	11/19/2015 8:55	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	pipe 2"	metal	a	yellow				<LOD
221	11/19/2015 8:56	Quantify Lead Paint	10.87	mg / cm ^2	Final	Negative	2.92	0.7	pipe 18"	metal	a	beige				0.09
222	11/19/2015 8:57	Quantify Lead Paint	10.91	mg / cm ^2	Final	Inconclusive	1.66	0.7	post	metal	b	yellow				0.78
223	11/19/2015 8:57	Quantify Lead Paint	10.75	mg / cm ^2	Final	Positive	1.59	0.7	post	metal	b	yellow				2.87
224	11/19/2015 8:58	Quantify Lead Paint	10.39	mg / cm ^2	Final	Negative	1	0.7	pipe 2"	metal	b	beige				<LOD
225	11/19/2015 8:58	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	c	grey				<LOD
226	11/19/2015 8:59	Quantify Lead Paint	11.63	mg / cm ^2	Final	Inconclusive	1.72	0.7	light pole base	concrete	c	yellow				0.63
227	11/19/2015 9:00	Quantify Lead Paint	9.71	mg / cm ^2	Final	Negative	1	0.7	light pole base	concrete	c	yellow				0.02
228	11/19/2015 9:02	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	water AST	metal	c	beige				<LOD
229	11/19/2015 9:02	Quantify Lead Paint	9.72	mg / cm ^2	Final	Negative	1	0.7	sump	concrete	d	grey				<LOD
230	11/19/2015 9:03	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1.47	0.7	light pole	metal	d	grey				0.1
231	11/19/2015 9:03	Quantify Lead Paint	10.32	mg / cm ^2	Final	Positive	1.33	0.7	light pole base	concrete	d	yellow				1.09
232	11/19/2015 9:06	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	pipe 18"	metal	pipe	beige	RWP basement			<LOD
233	11/19/2015 9:07	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	pump generator	metal	pump	beige				<LOD
234	11/19/2015 9:08	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	pipe	beige				<LOD
235	11/19/2015 9:09	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1.1	0.7	control valve	metal	valve	red				0.39
236	11/19/2015 9:11	Quantify Lead Paint	11.92	mg / cm ^2	Final	Negative	2.48	0.7	post	metal	a	yellow		n. primary clarifier		0.07
237	11/19/2015 9:13	Quantify Lead Paint	15.52	mg / cm ^2	Final	Negative	1	0.7	clarifier cover	metal	a	white				<LOD
238	11/19/2015 9:14	Quantify Lead Paint	11.47	mg / cm ^2	Final	Negative	1	0.7	clarifier wall	concrete	a	grey				<LOD
239	11/19/2015 9:15	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	2.65	0.7	post	metal	b	yellow				0.06
240	11/19/2015 9:16	Quantify Lead Paint	20.96	mg / cm ^2	Final	Negative	1	0.7	clarifier cover	metal	b	white				<LOD
241	11/19/2015 9:17	Quantify Lead Paint	15.74	mg / cm ^2	Final	Negative	2.44	0.7	clarifier wall	concrete	b	grey				0.18
242	11/19/2015 9:19	Quantify Lead Paint	11.12	mg / cm ^2	Final	Negative	1.72	0.7	light pole	metal	b	grey				0.18
243	11/19/2015 9:20	Quantify Lead Paint	10.77	mg / cm ^2	Final	Positive	1.54	0.7	light pole base	concrete	b	yellow				1.98
244	11/19/2015 9:21	Quantify Lead Paint	11.13	mg / cm ^2	Final	Negative	1	0.7	clarifier cover	metal	c	white				<LOD
245	11/19/2015 9:22	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	1	0.7	clarifier wall	concrete	c	grey				<LOD
246	11/19/2015 9:23	Quantify Lead Paint	11.01	mg / cm ^2	Final	Negative	2.98	0.7	pipe	metal	c	beige				0.02
247	11/19/2015 9:24	Quantify Lead Paint	10.78	mg / cm ^2	Final	Negative	1	0.7	sump wall	concrete	c	grey				<LOD
248	11/19/2015 9:25	Quantify Lead Paint	11.93	mg / cm ^2	Final	Negative	1.26	0.7	handrail 2"	metal	c	grey				0.09
249	11/19/2015 9:26	Quantify Lead Paint	11.58	mg / cm ^2	Final	Negative	1.31	0.7	handrail 2"	metal	c	yellow				0.18
250	11/19/2015 9:26	Quantify Lead Paint	11.09	mg / cm ^2	Final	Negative	1	0.7	pipe 2'	metal	c	white				<LOD
251	11/19/2015 9:31	Quantify Lead Paint	11.12	mg / cm ^2	Final	Negative	2.47	0.7	post	metal	d	yellow				0.09
252	11/19/2015 9:31	Quantify Lead Paint	11.92	mg / cm ^2	Final	Negative	1	0.7	clarifier cover	metal	d	white				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
253	11/19/2015 9:32	Quantify Lead Paint	11.45	mg / cm ^2	Final	Negative	1.56	0.7	clarifier wall	concrete	d	grey				0.18
254	11/19/2015 9:34	Quantify Lead Paint	11.23	mg / cm ^2	Final	Negative	1	0.7	clarifier cover	metal	a	white	s. primary clarifier			<LOD
255	11/19/2015 9:34	Quantify Lead Paint	11.72	mg / cm ^2	Final	Negative	1	0.7	clarifier wall	concrete	a	grey				<LOD
256	11/19/2015 9:35	Quantify Lead Paint	11.47	mg / cm ^2	Final	Negative	1	0.7	pipe 2'	fiberglass	a	white				<LOD
257	11/19/2015 9:36	Quantify Lead Paint	11.02	mg / cm ^2	Final	Positive	1.94	0.7	stairs	concrete	a	yellow				4.47
258	11/19/2015 9:38	Quantify Lead Paint	10.86	mg / cm ^2	Final	Negative	1.8	0.7	light pole	metal	a	grey				0.1
259	11/19/2015 9:38	Quantify Lead Paint	10.82	mg / cm ^2	Final	Negative	1.7	0.7	light pole base	concrete	a	yellow				0.51
260	11/19/2015 9:40	Quantify Lead Paint	12.63	mg / cm ^2	Final	Negative	3.24	0.7	post	metal	b	yellow				0.16
261	11/19/2015 9:40	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	clarifier cover	metal	b	white				<LOD
262	11/19/2015 9:40	Quantify Lead Paint	10.66	mg / cm ^2	Final	Negative	1.73	0.7	clarifier wall	concrete	b	grey				0.26
263	11/19/2015 9:41	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	2.21	0.7	post	metal	c	yellow				0.05
264	11/19/2015 9:42	Quantify Lead Paint	10.86	mg / cm ^2	Final	Negative	1	0.7	clarifier cover	metal	c	white				<LOD
265	11/19/2015 9:42	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1.49	0.7	clarifier cover	concrete	c	grey				0.2
266	11/19/2015 9:43	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	2.47	0.7	post	metal	d	yellow				0.35
267	11/19/2015 9:43	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	clarifier cover	metal	d	white				<LOD
268	11/19/2015 9:44	Quantify Lead Paint	10.4	mg / cm ^2	Final	Negative	2.21	0.7	clarifier wall	concrete	d	grey				0.17
269	11/19/2015 9:44	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1.09	0.7	pipe 6"	metal	d	black				0.12
270	11/19/2015 9:45	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	AST tank	fiberglass	d	white				<LOD
271	11/19/2015 9:47	Quantify Lead Paint	10.5	mg / cm ^2	Final	Positive	1.68	0.7	post	metal	pipe	yellow	s. of RWP			1.31
272	11/19/2015 9:47	Quantify Lead Paint	0.5	mg / cm ^2	Final	Negative	5.07	0.7	post	metal	pipe	yellow				<LOD
273	11/19/2015 9:48	Quantify Lead Paint	9.03	mg / cm ^2	Final	Positive	1.21	0.7	sump handrail	metal	pipe	yellow				1.32
274	11/19/2015 9:49	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	sump wall	concrete	wall	grey				<LOD
275	11/19/2015 9:50	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	sump cover	fiberglass	sump	white	w. sump			<LOD
276	11/19/2015 9:51	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	4.99	0.7	light pole	metal	pole	black		air blower building		<LOD
277	11/19/2015 9:52	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	light pole base	concrete	pole	yellow				<LOD
278	11/19/2015 9:53	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	a	white				<LOD
279	11/19/2015 9:54	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	vent	metal	a	brown				<LOD
280	11/19/2015 9:55	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	brown				<LOD
281	11/19/2015 9:56	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	b	white				<LOD
282	11/19/2015 9:56	Quantify Lead Paint	10.75	mg / cm ^2	Final	Negative	1	0.7	door	metal	b	brown				<LOD
283	11/19/2015 9:57	Quantify Lead Paint	10.86	mg / cm ^2	Final	Negative	1	0.7	window frame	metal	b	beige				<LOD
284	11/19/2015 9:57	Quantify Lead Paint	11.11	mg / cm ^2	Final	Negative	1	0.7	vent	metal	c	brown				<LOD
285	11/19/2015 9:58	Quantify Lead Paint	10.68	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	white				<LOD
286	11/19/2015 9:58	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	white				<LOD
287	11/19/2015 9:59	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	door	metal	d	brown				<LOD
288	11/19/2015 9:59	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	white		maintenance building		<LOD
289	11/19/2015 10:01	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	b	white				<LOD
290	11/19/2015 10:02	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	white				<LOD
291	11/19/2015 10:02	Quantify Lead Paint	10.78	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	white				<LOD
292	11/19/2015 10:03	Quantify Lead Paint	10.79	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	green				<LOD
293	11/19/2015 10:03	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	ceiling	wood	e	white				<LOD
294	11/19/2015 10:04	Quantify Lead Paint	10.96	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	white	exterior			<LOD
295	11/19/2015 10:05	Quantify Lead Paint	10.19	mg / cm ^2	Final	Negative	1	0.7	roof trim	wood	a	beige				0.36
296	11/19/2015 10:06	Quantify Lead Paint	11.82	mg / cm ^2	Final	Negative	2.5	0.7	roof trim	metal	a	brown				<LOD
297	11/19/2015 10:06	Quantify Lead Paint	11.12	mg / cm ^2	Final	Negative	1	0.7	wall	wood	a	grey				0.3
298	11/19/2015 10:07	Quantify Lead Paint	10.89	mg / cm ^2	Final	Negative	1.84	0.7	wall	metal	c	purple				<LOD
299	11/19/2015 10:09	Quantify Lead Paint	10.78	mg / cm ^2	Final	Negative	1.74	0.7	roof trim	wood	c	beige				0.16
300	11/19/2015 10:10	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	1	0.7	roof trim	metal	c	brown				<LOD
301	11/19/2015 10:11	Quantify Lead Paint	0.15	mg / cm ^2	Final	Negative	1	0.7	pipe 8"	metal	c	beige				<LOD
302	11/19/2015 10:11	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	white				<LOD
303	11/19/2015 10:12	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	1	0.7	sidewalk	concrete	d	white				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
304	11/19/2015 10:13	Quantify Lead Paint	10.09	mg / cm ^2	Final	Negative	1	0.7	wall	wood	a	yellow		maintenance shed		<LOD
305	11/19/2015 10:19	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	wall	wood	b	yellow				<LOD
306	11/19/2015 10:19	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	wall	wood	c	yellow				<LOD
307	11/19/2015 10:20	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	wall	wood	d	yellow				<LOD
308	11/19/2015 10:21	Quantify Lead Paint	10.79	mg / cm ^2	Final	Negative	1	0.7	door	wood	d	brown				0.08
309	11/19/2015 10:22	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	2.14	0.7	AST tank	concrete	a	white	pump room	APD AST		<LOD
310	11/19/2015 10:24	Quantify Lead Paint	10.79	mg / cm ^2	Final	Negative	2.58	0.7	AST tank	concrete	b	white				0.25
311	11/19/2015 10:26	Quantify Lead Paint	11	mg / cm ^2	Final	Negative	1.61	0.7	wall	concrete	b	white				0.03
312	11/19/2015 10:26	Quantify Lead Paint	10.87	mg / cm ^2	Final	Negative	3.21	0.7	AST tank	concrete	b	white		ASD AST		0.12
313	11/19/2015 10:28	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	2.63	0.7	AST tank	concrete	c	white				0.08
314	11/19/2015 10:29	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	yellow	spill containment			<LOD
315	11/19/2015 10:31	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1.59	0.7	pipe	metal	c	green				0.04
316	11/19/2015 10:32	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	2.62	0.7	wall	concrete	d	white				0.2
317	11/19/2015 10:33	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	pipe	fiberglass	d	white				<LOD
318	11/19/2015 10:34	Quantify Lead Paint	10.99	mg / cm ^2	Final	Negative	2.82	0.7	wall	concrete	d	white	pump room			0.14
319	11/19/2015 10:34	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	door	metal	d	brown				<LOD
320	11/19/2015 10:35	Quantify Lead Paint	10.75	mg / cm ^2	Final	Negative	1	0.7	pipe 4"	metal	pipe	beige				<LOD
321	11/19/2015 10:36	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	pipe	beige				<LOD
322	11/19/2015 10:36	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	2.58	0.7	generator	metal	generator	beige				0.29
323	11/19/2015 10:37	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	3.29	0.7	window frame	wood	b	beige				0.14
324	11/19/2015 10:38	Quantify Lead Paint	13.32	mg / cm ^2	Final	Negative	1	0.7	wall	fiberglass	d	white	air scrubber compound			<LOD
325	11/19/2015 10:40	Quantify Lead Paint	10.89	mg / cm ^2	Final	Positive	2.23	0.7	post	metal	d	yellow		APD AST		1.74
326	11/19/2015 10:40	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	white				<LOD
327	11/19/2015 11:02	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	pipe	beige		burner		<LOD
328	11/19/2015 11:03	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	pipe	brown				<LOD
329	11/19/2015 11:03	Quantify Lead Paint	9.97	mg / cm ^2	Final	Negative	1	0.7	burner base	metal	base	brown				<LOD
330	11/19/2015 11:04	Quantify Lead Paint	12.97	mg / cm ^2	Final	Negative	1	0.7	burner base	metal	base	silver				<LOD
331	11/20/2015 7:57	Quantify Lead Paint	20.85	mg / cm ^2	Final	Positive	1.11	0.7							Calibration	1.07
332	11/20/2015 7:57	Quantify Lead Paint	20.51	mg / cm ^2	Final	Positive	1.11	0.7							Calibration	1.08
333	11/20/2015 7:58	Quantify Lead Paint	21.21	mg / cm ^2	Final	Positive	1.14	0.7							Calibration	1.1
334	11/20/2015 7:59	Quantify Lead Paint	20.51	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
335	11/20/2015 8:00	Quantify Lead Paint	20.87	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
336	11/20/2015 8:00	Quantify Lead Paint	20.94	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
337	11/20/2015 8:07	Quantify Lead Paint	10.85	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	beige	1st floor	SDB building		<LOD
338	11/20/2015 8:07	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	pipe 2"	metal	a	green				<LOD
339	11/20/2015 8:08	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	brown				<LOD
340	11/20/2015 8:08	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	rollup door	metal	a	beige				<LOD
341	11/20/2015 8:09	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1	0.7	vent duct	metal	a	beige				<LOD
342	11/20/2015 8:10	Quantify Lead Paint	10.4	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	b	beige				<LOD
343	11/20/2015 8:10	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	b	beige				<LOD
344	11/20/2015 8:11	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1	0.7	pipe 2"	metal	b	green				<LOD
345	11/20/2015 8:12	Quantify Lead Paint	10.19	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	b	beige				<LOD
346	11/20/2015 8:12	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	1	0.7	cabinets	metal	b	yellow				<LOD
347	11/20/2015 8:13	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	beige				<LOD
348	11/20/2015 8:13	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	door	metal	c	brown				<LOD
349	11/20/2015 8:14	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	c	brown				<LOD
350	11/20/2015 8:14	Quantify Lead Paint	10.51	mg / cm ^2	Final	Negative	1	0.7	pipe 2"	metal	c	green				<LOD
351	11/20/2015 8:15	Quantify Lead Paint	10.66	mg / cm ^2	Final	Negative	1	0.7	vent duct	metal	c	beige				<LOD
352	11/20/2015 8:16	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	stairs	metal	c	beige				<LOD
353	11/20/2015 8:16	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	beige				<LOD
354	11/20/2015 8:17	Quantify Lead Paint	11.45	mg / cm ^2	Final	Negative	1	0.7	door	metal	d	brown				<LOD
355	11/20/2015 8:17	Quantify Lead Paint	9.73	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	d	brown				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
356	11/20/2015 8:18	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	rollup door	metal	d	beige				<LOD
357	11/20/2015 8:18	Quantify Lead Paint	12.51	mg / cm ^2	Final	Negative	1	0.7	column	metal	d	beige				<LOD
358	11/20/2015 8:20	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1	0.7	vent duct	metal	d	beige				<LOD
359	11/20/2015 8:20	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	2.56	0.7	pipe 2"	metal	d	green				<LOD
360	11/20/2015 8:21	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	e	beige				0.04
361	11/20/2015 8:22	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1.29	0.7	conveyor belt	metal	e	beige				<LOD
362	11/20/2015 8:24	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	beige	2nd floor press office			<LOD
363	11/20/2015 8:24	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	b	beige				<LOD
364	11/20/2015 8:25	Quantify Lead Paint	0.49	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	c	beige				<LOD
365	11/20/2015 8:26	Quantify Lead Paint	9.72	mg / cm ^2	Final	Negative	1	0.7	window frame	metal	c	tan				<LOD
366	11/20/2015 8:27	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	d	beige				<LOD
367	11/20/2015 8:27	Quantify Lead Paint	9.73	mg / cm ^2	Final	Negative	1	0.7	door	wood	d	tan				<LOD
368	11/20/2015 8:27	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	door jamb	wood	d	tan				<LOD
369	11/20/2015 8:28	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	window frame	metal	d	tan				<LOD
370	11/20/2015 8:28	Quantify Lead Paint	12.62	mg / cm ^2	Final	Negative	1	0.7	ceiling	drywall	e	beige				<LOD
371	11/20/2015 8:31	Quantify Lead Paint	10.53	mg / cm ^2	Final	Positive	1.18	0.7	roof access frame	metal	e	yellow				1.24
372	11/20/2015 8:34	Quantify Lead Paint	10.54	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	a	white	exterior			<LOD
373	11/20/2015 8:35	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1	0.7	rollup door	metal	a	brown				<LOD
374	11/20/2015 8:36	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	window frame	metal	a	white				<LOD
375	11/20/2015 8:36	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	pipe 2"	plastic	a	purple				<LOD
376	11/20/2015 8:37	Quantify Lead Paint	10.73	mg / cm ^2	Final	Negative	1	0.7	AST tank	fiberglass	a	white				<LOD
377	11/20/2015 8:38	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	1	0.7	pipe 2"	metal	a	blue				<LOD
378	11/20/2015 8:38	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	2.39	0.7	pump frame	metal	a	beige				0.06
379	11/20/2015 8:39	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	pump cover	fiberglass	a	white				<LOD
380	11/20/2015 8:40	Quantify Lead Paint	10.66	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	b	white				<LOD
381	11/20/2015 8:40	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	window frame	metal	b	white				<LOD
382	11/20/2015 8:41	Quantify Lead Paint	10.4	mg / cm ^2	Final	Negative	1	0.7	pipe 1.5"	plastic	b	tan				<LOD
383	11/20/2015 8:42	Quantify Lead Paint	11.12	mg / cm ^2	Final	Negative	1.61	0.7	fence	metal	b	green				0.3
384	11/20/2015 8:43	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	c	white				<LOD
385	11/20/2015 8:43	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	window frame	metal	c	white				<LOD
386	11/20/2015 8:48	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	conveyor belt	fiberglass	c	beige	storage/convayor building			<LOD
387	11/20/2015 8:49	Quantify Lead Paint	10.54	mg / cm ^2	Final	Positive	1.29	0.7	stairs	metal	c	yellow				3.68
388	11/20/2015 8:50	Quantify Lead Paint	11.1	mg / cm ^2	Final	Negative	1	0.7	post	metal	c	yellow				<LOD
389	11/20/2015 8:53	Quantify Lead Paint	10.4	mg / cm ^2	Final	Negative	1	0.7	column	metal	c	beige				<LOD
390	11/20/2015 8:54	Quantify Lead Paint	11.13	mg / cm ^2	Final	Negative	1	0.7	beam	metal	c	beige				<LOD
391	11/20/2015 8:55	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	room	metal	c	beige				<LOD
392	11/20/2015 8:56	Quantify Lead Paint	10.65	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	c	beige				<LOD
393	11/20/2015 8:57	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	c	grey				<LOD
394	11/20/2015 8:57	Quantify Lead Paint	10.87	mg / cm ^2	Final	Negative	1.82	0.7	light pole base	concrete	c	yellow				0.31
395	11/20/2015 8:58	Quantify Lead Paint	10.87	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	c	tan				<LOD
396	11/20/2015 8:59	Quantify Lead Paint	10.89	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	c	tan				<LOD
397	11/20/2015 8:59	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	sump wall	concrete	c	grey				<LOD
398	11/20/2015 9:00	Quantify Lead Paint	10.87	mg / cm ^2	Final	Negative	1	0.7	storage conntainer	metal	c	olive green				<LOD
399	11/20/2015 9:01	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	d	white				<LOD
400	11/20/2015 9:01	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	rollup door	metal	d	brown				<LOD
401	11/20/2015 9:28	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	grey		SASC building		<LOD
402	11/20/2015 9:29	Quantify Lead Paint	11.37	mg / cm ^2	Final	Positive	1.17	0.7	handrails	metal	a	yellow				1.33
403	11/20/2015 9:30	Quantify Lead Paint	12.61	mg / cm ^2	Final	Negative	1	0.7	pipe 10"	metal	a	beige				<LOD
404	11/20/2015 9:31	Quantify Lead Paint	12.62	mg / cm ^2	Final	Negative	1	0.7	pump	metal	a	blue				<LOD
405	11/20/2015 9:31	Quantify Lead Paint	12.86	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	a	beige				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
406	11/20/2015 9:32	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1.87	0.7	light pole	metal	a	grey				0.13
407	11/20/2015 9:32	Quantify Lead Paint	10.66	mg / cm ^2	Final	Negative	1.73	0.7	light pole base	concrete	a	yellow				0.21
408	11/20/2015 9:36	Quantify Lead Paint	10.77	mg / cm ^2	Final	Positive	5.96	0.7	pipe 12"	metal	a	beige/green				3.77
409	11/20/2015 9:44	Quantify Lead Paint	11.1	mg / cm ^2	Final	Positive	4.38	0.7	pipe 12"	metal	b	beige/green				3.74
410	11/20/2015 9:45	Quantify Lead Paint	10.87	mg / cm ^2	Final	Negative	1.44	0.7	pipe support 2"	metal	b	beige				0.03
411	11/20/2015 9:46	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	pipe 4"	metal	b	beige				<LOD
412	11/20/2015 9:46	Quantify Lead Paint	10.29	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	b	grey				<LOD
413	11/20/2015 9:47	Quantify Lead Paint	9.36	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	b	black				<LOD
414	11/20/2015 9:47	Quantify Lead Paint	10.43	mg / cm ^2	Final	Positive	2.29	0.7	light pole base	concrete	b	yellow				3.42
415	11/20/2015 9:48	Quantify Lead Paint	10.43	mg / cm ^2	Final	Positive	4.3	0.7	pipe 12"	metal	c	beige				2.62
416	11/20/2015 9:49	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	1.62	0.7	pipe support 2"	metal	c	beige				0.04
417	11/20/2015 9:49	Quantify Lead Paint	10.76	mg / cm ^2	Final	Positive	2.32	0.7	pipe 4"	metal	c	beige/green				1.48
418	11/20/2015 9:50	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1.78	0.7	light pole	metal	c	grey				0.1
419	11/20/2015 9:51	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	1	0.7	light pole base	concrete	c	yellow				<LOD
420	11/20/2015 9:52	Quantify Lead Paint	12.54	mg / cm ^2	Final	Negative	1.19	0.7	light pole base	concrete	c	yellow				0.5
421	11/20/2015 9:55	Quantify Lead Paint	9.74	mg / cm ^2	Final	Negative	1	0.7	pipe 12"	metal	d	beige				<LOD
422	11/20/2015 9:56	Quantify Lead Paint	10.86	mg / cm ^2	Final	Positive	1.98	0.7	pipe 4"	metal	d	beige/green				2.53
423	11/20/2015 9:56	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	d	grey				<LOD
424	11/20/2015 10:04	Quantify Lead Paint	10.89	mg / cm ^2	Final	Negative	1	0.7	walkway	wood	e	brown				<LOD
425	11/20/2015 10:07	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	d	black				<LOD
426	11/20/2015 10:07	Quantify Lead Paint	10.68	mg / cm ^2	Final	Negative	1	0.7	light pole base	concrete	d	yellow				<LOD
427	11/20/2015 10:08	Quantify Lead Paint	12.53	mg / cm ^2	Final	Negative	1.38	0.7	fence	metal	d	green				0.08
428	11/23/2015 8:11	Quantify Lead Paint	20.89	mg / cm ^2	Final	Positive	1.14	0.7							Calibration	1.08
429	11/23/2015 8:12	Quantify Lead Paint	20.62	mg / cm ^2	Final	Positive	1.11	0.7							Calibration	1.07
430	11/23/2015 8:12	Quantify Lead Paint	20.28	mg / cm ^2	Final	Positive	1.12	0.7							Calibration	1.05
431	11/23/2015 8:13	Quantify Lead Paint	20.5	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
432	11/23/2015 8:13	Quantify Lead Paint	20.52	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
433	11/23/2015 8:13	Quantify Lead Paint	20.51	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
434	11/23/2015 9:53	Quantify Lead Paint	10.66	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	a	white	s. generator room	headworks building		<LOD
435	11/23/2015 9:54	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	brown				<LOD
436	11/23/2015 9:54	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	a	brown				<LOD
437	11/23/2015 9:55	Quantify Lead Paint	10.51	mg / cm ^2	Final	Negative	1	0.7	window frame	metal	a	black				<LOD
438	11/23/2015 9:55	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	door	metal	c	brown				<LOD
439	11/23/2015 9:56	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	c	brown				<LOD
440	11/23/2015 9:56	Quantify Lead Paint	10.79	mg / cm ^2	Final	Negative	1	0.7	door	metal	d	brown				<LOD
441	11/23/2015 9:56	Quantify Lead Paint	10.39	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	d	brown				<LOD
442	11/23/2015 9:57	Quantify Lead Paint	10.74	mg / cm ^2	Final	Negative	1	0.7	cran frame	metal	f	tan				0.02
443	11/23/2015 9:58	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	generator	metal	f	blue				<LOD
444	11/23/2015 9:59	Quantify Lead Paint	18.3	mg / cm ^2	Final	Inconclusive	1.08	0.7	valve handel	metal	f	red				0.59
445	11/23/2015 9:59	Quantify Lead Paint	10.91	mg / cm ^2	Final	Inconclusive	1.19	0.7	valve handel	metal	f	red				0.78
446	11/23/2015 10:00	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	valve handel	metal	f	beige				<LOD
447	11/23/2015 10:07	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	brown	electric panel room			<LOD
448	11/23/2015 10:08	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	a	brown				<LOD
449	11/23/2015 10:08	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	b	white				<LOD
450	11/23/2015 10:08	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1.02	0.7	wall	drywall	c	white				<LOD
451	11/23/2015 10:09	Quantify Lead Paint	11.03	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	d	white				<LOD
452	11/23/2015 10:10	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	a	yellow	restroom			<LOD
453	11/23/2015 10:10	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	wall	ceramic 6"	a	grey				<LOD
454	11/23/2015 10:11	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	b	white				<LOD
455	11/23/2015 10:12	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1	0.7	wall	ceramic 6"	b	grey				<LOD
456	11/23/2015 10:12	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	door	metal	b	brown				<LOD
457	11/23/2015 10:12	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	b	brown				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
458	11/23/2015 10:13	Quantify Lead Paint	15.06	mg / cm ^2	Final	Negative	1	0.7	wall	drywall	c	yellow				<LOD
459	11/23/2015 10:13	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	1	0.7	wall	ceramic 6"	c	grey				<LOD
460	11/23/2015 10:14	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	floor	ceramic 2"	f	grey				<LOD
461	11/23/2015 10:14	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	toilet	ceramic	f	white				<LOD
462	11/23/2015 10:16	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	brown	n. generator room			<LOD
463	11/23/2015 10:16	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	a	brown				<LOD
464	11/23/2015 10:16	Quantify Lead Paint	9.63	mg / cm ^2	Final	Negative	1	0.7	door	metal	b	brown				<LOD
465	11/23/2015 10:17	Quantify Lead Paint	10.39	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	b	brown				<LOD
466	11/23/2015 10:17	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1	0.7	door	metal	d	brown				<LOD
467	11/23/2015 10:18	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	d	brown				<LOD
468	11/23/2015 10:18	Quantify Lead Paint	10.4	mg / cm ^2	Final	Negative	1	0.7	door	metal	d	brown				<LOD
469	11/23/2015 10:18	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	d	brown				<LOD
470	11/23/2015 10:20	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	pump frame	metal	f	beige				<LOD
471	11/23/2015 10:20	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	pipe 12"	metal	f	beige				<LOD
472	11/23/2015 10:21	Quantify Lead Paint	10.1	mg / cm ^2	Final	Negative	1	0.7	pipe 4"	metal	f	beige				<LOD
473	11/23/2015 10:21	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	generator frame	metal	f	tan				<LOD
474	11/23/2015 10:22	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	scrubber	metal	f	tan				<LOD
475	11/23/2015 10:23	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	f	beige				<LOD
476	11/23/2015 10:24	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	brown	convayor belt room			<LOD
477	11/23/2015 10:24	Quantify Lead Paint	10.87	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	a	brown				<LOD
478	11/23/2015 10:25	Quantify Lead Paint	11.11	mg / cm ^2	Final	Negative	1	0.7	door	metal	b	brown				<LOD
479	11/23/2015 10:25	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	b	brown				<LOD
480	11/23/2015 10:25	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	door	metal	c	brown				<LOD
481	11/23/2015 10:25	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	c	brown				<LOD
482	11/23/2015 10:26	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	10	0.7	conveyor belt	metal	f	beige				<LOD
483	11/23/2015 10:28	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	window	glass	a	clear	sludge treatment room			<LOD
484	11/23/2015 10:28	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	window frame	metal	a	beige				<LOD
485	11/23/2015 10:29	Quantify Lead Paint	10.66	mg / cm ^2	Final	Negative	1	0.7	pipe 15"	fiberglass	b	white				<LOD
486	11/23/2015 10:30	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	b	black				<LOD
487	11/23/2015 10:30	Quantify Lead Paint	10.67	mg / cm ^2	Final	Negative	1	0.7	window	glass	c	clear				<LOD
488	11/23/2015 10:31	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	window jamb	metal	c	beige				<LOD
489	11/23/2015 10:31	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1	0.7	vent pipe	fiberglass	d	white				<LOD
490	11/23/2015 10:32	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	water lift box	metal	f	beige				<LOD
491	11/23/2015 10:33	Quantify Lead Paint	10.32	mg / cm ^2	Final	Negative	1	0.7	treatment box	fiberglass	f	white				<LOD
492	11/23/2015 10:33	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	f	beige				<LOD
493	11/23/2015 10:34	Quantify Lead Paint	10.19	mg / cm ^2	Final	Negative	1	0.7	pipe 4"	metal	f	beige				<LOD
494	11/23/2015 10:34	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	ceiling	drywall	e	white				<LOD
495	11/23/2015 10:36	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	a	white	exterior			<LOD
496	11/23/2015 10:37	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	door	metal	a	brown				<LOD
497	11/23/2015 10:37	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	a	brown				<LOD
498	11/23/2015 10:38	Quantify Lead Paint	10.89	mg / cm ^2	Final	Negative	1	0.7	pipe 2"	fiberglass	a	beige				<LOD
499	11/23/2015 10:39	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	window vent	metal	a	brown				<LOD
500	11/23/2015 10:39	Quantify Lead Paint	10.07	mg / cm ^2	Final	Positive	1.61	0.7	post	metal	a	yellow				1.94
501	11/23/2015 10:40	Quantify Lead Paint	10.4	mg / cm ^2	Final	Negative	1	0.7	downspout	metal	a	brown				<LOD
502	11/23/2015 10:41	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	AST tank	metal	a	beige				<LOD
503	11/23/2015 10:42	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	b	white				<LOD
504	11/23/2015 10:43	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	door	metal	b	brown				<LOD
505	11/23/2015 10:43	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	b	brown				<LOD
506	11/23/2015 10:43	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1.54	0.7	pipe 1.5"	metal	b	green				0.02
507	11/23/2015 10:44	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	door	metal	b	brown				<LOD
508	11/23/2015 10:44	Quantify Lead Paint	10.08	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	b	brown				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
509	11/23/2015 10:45	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	c	white				<LOD
510	11/23/2015 10:46	Quantify Lead Paint	10.42	mg / cm ^2	Final	Positive	1.62	0.7	post	metal	c	yellow				2.71
511	11/23/2015 10:46	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	c	white				<LOD
512	11/23/2015 10:46	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	c	white				<LOD
513	11/23/2015 10:47	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1	0.7	door	metal	c	brown				<LOD
514	11/23/2015 10:48	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	c	brown				<LOD
515	11/23/2015 10:48	Quantify Lead Paint	9.72	mg / cm ^2	Final	Negative	1	0.7	sump cover	fiberglass	c	beige				<LOD
516	11/23/2015 10:49	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	c	beige				<LOD
517	11/23/2015 10:49	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	3.22	0.7	pipe 5"	plastic	c	white				0.29
518	11/23/2015 10:50	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1	0.7	pipe 2"	metal	c	white				<LOD
519	11/23/2015 10:51	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1.1	0.7	control valve	metal	c	brown				0.18
520	11/23/2015 10:51	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	window vent	metal	c	brown				<LOD
521	11/23/2015 10:52	Quantify Lead Paint	10.44	mg / cm ^2	Final	Negative	1	0.7	window jamb	metal	c	brown				<LOD
522	11/23/2015 10:52	Quantify Lead Paint	10.06	mg / cm ^2	Final	Negative	1.64	0.7	pipe 1.5"	metal	c	orange				0.03
523	11/23/2015 10:53	Quantify Lead Paint	11.13	mg / cm ^2	Final	Negative	1	0.7	AST tank	plastic	c	white				<LOD
524	11/23/2015 10:54	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	wall	stucco	d	white				<LOD
525	11/23/2015 10:54	Quantify Lead Paint	9.97	mg / cm ^2	Final	Negative	1	0.7	door	metal	d	brown				<LOD
526	11/23/2015 10:55	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	d	brown				<LOD
527	11/23/2015 11:36	Quantify Lead Paint	11.12	mg / cm ^2	Final	Negative	2.04	0.7	light pole	metal	a	grey		LET AST		<LOD
528	11/23/2015 11:37	Quantify Lead Paint	11.57	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	a	beige				<LOD
529	11/23/2015 11:37	Quantify Lead Paint	11.47	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	a	beige				<LOD
530	11/23/2015 11:37	Quantify Lead Paint	11.11	mg / cm ^2	Final	Negative	1	0.7	air vent	metal	a	tan				<LOD
531	11/23/2015 11:39	Quantify Lead Paint	11.81	mg / cm ^2	Final	Negative	1	0.7	gate	metal	a	green				<LOD
532	11/23/2015 12:31	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	b	beige				<LOD
533	11/23/2015 12:31	Quantify Lead Paint	10.51	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	b	beige				<LOD
534	11/23/2015 12:32	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	pipe 15"	metal	c	beige				<LOD
535	11/23/2015 12:33	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	fence	plastic	c	tan				<LOD
536	11/23/2015 12:33	Quantify Lead Paint	10.59	mg / cm ^2	Final	Inconclusive	7.63	0.7	pipe 12"	metal	c	beige				0.67
537	11/23/2015 12:34	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	pipe 12"	metal	c	beige				<LOD
538	11/23/2015 12:35	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	c	grey				<LOD
539	11/23/2015 12:35	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	c	beige				<LOD
540	11/23/2015 12:37	Quantify Lead Paint	10.65	mg / cm ^2	Final	Negative	1	0.7	fence	plastic	d	tan				<LOD
541	11/23/2015 12:37	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	pipe 5"	metal	d	beige				<LOD
542	11/23/2015 12:37	Quantify Lead Paint	10.66	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	d	beige				<LOD
543	11/23/2015 12:57	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	brown		south pacific pump station		<LOD
544	11/23/2015 12:57	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	yellow				<LOD
545	11/23/2015 12:58	Quantify Lead Paint	12.52	mg / cm ^2	Final	Negative	1	0.7	electric panel	wood	a	tan				<LOD
546	11/23/2015 12:58	Quantify Lead Paint	9.97	mg / cm ^2	Final	Negative	1	0.7	electric panel	wood	a	brown				<LOD
547	11/23/2015 12:59	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	electric panel	metal	a	brown				<LOD
548	11/23/2015 13:00	Quantify Lead Paint	9.27	mg / cm ^2	Final	Negative	1	0.7	generator	metal	a	tan				<LOD
549	11/23/2015 13:00	Quantify Lead Paint	9.01	mg / cm ^2	Final	Negative	1	0.7	generator	metal	a	black				<LOD
550	11/23/2015 13:01	Quantify Lead Paint	10.78	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	a	grey				<LOD
551	11/23/2015 13:02	Quantify Lead Paint	10.88	mg / cm ^2	Final	Negative	1	0.7	light pole base	concrete	a	yellow				<LOD
552	11/23/2015 13:03	Quantify Lead Paint	9.13	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	b	yellow				<LOD
553	11/23/2015 13:03	Quantify Lead Paint	13.87	mg / cm ^2	Final	Inconclusive	1.81	0.7	electric panel	wood	b	brown				0.61
554	11/23/2015 13:05	Quantify Lead Paint	10.51	mg / cm ^2	Final	Negative	1	0.7	window	wood	b	brown				<LOD
555	11/23/2015 13:05	Quantify Lead Paint	10.18	mg / cm ^2	Final	Negative	1.56	0.7	pipe 5"	metal	b	brown				0.18
556	11/23/2015 13:06	Quantify Lead Paint	10.95	mg / cm ^2	Final	Inconclusive	1.3	0.7	pipe 2"	metal	b	yellow				0.71
557	11/23/2015 13:07	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	2.98	0.7	pipe 6"	plastic	b	blue				<LOD
558	11/23/2015 13:08	Quantify Lead Paint	9.88	mg / cm ^2	Final	Inconclusive	1.37	0.7	handrail 1"	metal	b	yellow				0.6
559	11/23/2015 13:09	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	1	0.7	valve handel	metal	b	red				<LOD
560	11/23/2015 13:10	Quantify Lead Paint	10.31	mg / cm ^2	Final	Negative	1	0.7	door	metal	c	brown				<LOD
561	11/23/2015 13:11	Quantify Lead Paint	10.41	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	c	brown				<LOD

=	Time	Type	Duration	Units	Sequence	Results	Depth Index	Action Level	Component	Substrate	Side	Color	Room	Building/Area	Misc	Pb
562	11/23/2015 13:11	Quantify Lead Paint	12.86	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	yellow				<LOD
563	11/23/2015 13:12	Quantify Lead Paint	9.61	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	c	brown				<LOD
564	11/23/2015 13:12	Quantify Lead Paint	10.77	mg / cm ^2	Final	Negative	1	0.7	sump wall	concrete	c	beige				<LOD
565	11/23/2015 13:13	Quantify Lead Paint	10.93	mg / cm ^2	Final	Inconclusive	1.33	0.7	handrail 1"	metal	c	yellow				0.66
566	11/23/2015 13:14	Quantify Lead Paint	10.42	mg / cm ^2	Final	Negative	2.64	0.7	wall	concrete	d	yellow				0.5
567	11/23/2015 13:14	Quantify Lead Paint	10.52	mg / cm ^2	Final	Negative	1	0.7	window	wood	d	brown				<LOD
568	11/23/2015 13:15	Quantify Lead Paint	10.51	mg / cm ^2	Final	Negative	1	0.7	wall	concrete	a	yellow				<LOD
569	11/23/2015 13:16	Quantify Lead Paint	10.78	mg / cm ^2	Final	Negative	1.62	0.7	wall	concrete	c	green				0.03
570	11/23/2015 13:17	Quantify Lead Paint	10.33	mg / cm ^2	Final	Positive	1.2	0.7	stairs	concrete	c	yellow				1.99
571	11/23/2015 13:18	Quantify Lead Paint	10.32	mg / cm ^2	Final	Positive	1.15	0.7	electric panel	metal	c	yellow				1.57
572	11/23/2015 13:21	Quantify Lead Paint	10.66	mg / cm ^2	Final	Negative	1	0.7	post	metal	a	yellow		outfall pump station		<LOD
573	11/23/2015 13:21	Quantify Lead Paint	10.68	mg / cm ^2	Final	Negative	1	0.7	air vent	metal	a	tan				<LOD
574	11/23/2015 13:22	Quantify Lead Paint	9.6	mg / cm ^2	Final	Negative	1	0.7	canopy column	metal	b	tan				<LOD
575	11/23/2015 13:24	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	roof	metal	e	tan				<LOD
576	11/23/2015 13:25	Quantify Lead Paint	11.11	mg / cm ^2	Final	Negative	1	0.7	light pole	metal	c	grey				<LOD
577	11/23/2015 13:26	Quantify Lead Paint	10.53	mg / cm ^2	Final	Negative	1	0.7	generator	metal	d	beige				<LOD
578	11/23/2015 13:36	Quantify Lead Paint	10.76	mg / cm ^2	Final	Negative	1	0.7	door	metal	b	tan	basement			<LOD
579	11/23/2015 13:36	Quantify Lead Paint	10.51	mg / cm ^2	Final	Negative	1	0.7	door jamb	metal	b	tan				<LOD
580	11/23/2015 13:37	Quantify Lead Paint	10.87	mg / cm ^2	Final	Negative	1	0.7	pipe 6"	metal	f	yellow				<LOD
581	11/23/2015 13:37	Quantify Lead Paint	10.43	mg / cm ^2	Final	Negative	1	0.7	pump housing	metal	f	yellow				<LOD
582	11/23/2015 13:38	Quantify Lead Paint	10.07	mg / cm ^2	Final	Negative	1	0.7	pipe 18"	metal	f	yellow				<LOD
583	11/23/2015 13:39	Quantify Lead Paint	10.09	mg / cm ^2	Final	Negative	1	0.7	air duct	metal	d	yellow				<LOD
584	11/23/2015 14:05	Quantify Lead Paint	20.85	mg / cm ^2	Final	Positive	1.11	0.7							Calibration	1.04
585	11/23/2015 14:05	Quantify Lead Paint	21.57	mg / cm ^2	Final	Positive	1.16	0.7							Calibration	1.06
586	11/23/2015 14:06	Quantify Lead Paint	20.84	mg / cm ^2	Final	Positive	1.13	0.7							Calibration	1.04
587	11/23/2015 14:07	Quantify Lead Paint	21.19	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
588	11/23/2015 14:07	Quantify Lead Paint	22.15	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD
589	11/23/2015 14:08	Quantify Lead Paint	22.95	mg / cm ^2	Final	Negative	1	0.7							Calibration	<LOD

Note:

<LOD = below the XRF equipment level of detection of 0.01 mg/cm².

mg/cm² = milligrams per centemeter square.

a,b,c,d,e,f = north side, east side, south side, west side, floor, ceiling.

APPENDIX C

LABORATORY REPORTS, CHAIN-OF-CUSTODY FORMS
FOR LBP AND LCM SAMPLES, AND LABORATORIES' ELAP CERTIFICATES

La Salina Lift Station and Treatment Plant Decommissioning

Appendix K. Pre-Demolition Asbestos Hazardous Materials Survey Report

TETRA TECH

December 30, 2015

Ms. Amy Czajkowski, P.E.
City of Oceanside
1330 South Tait Street
Oceanside, California 92054

RE: Pre-Demolition Asbestos Hazardous Materials Survey Report
La Salina Waste Water Treatment Plant

Dear Mr. Amy:

Tetra Tech, Inc. (Tetra Tech) is pleased to submit the enclosed Pre-Demolition Asbestos Hazardous Materials Survey Report for the La Salina Waste Water Treatment Plant (La Salina WWTP) located at 1330 Tait Street, Oceanside, California (the Site).

This pre-demolition asbestos survey was performed for the La Salina WWTP between November 16 and November 23, 2015. The La Salina WWTP was evaluated for the presence, location, and quantity of suspected asbestos-containing materials (ACM) that might require pre-demolition abatement in accordance with the National Emissions Standards for Hazardous Air Pollutants (NESHAP), as adopted by the United States Environmental Protection Agency (USEPA). The intent of the asbestos NESHAP regulation is to protect the public and workers by minimizing the release of asbestos fibers during activities that involve processing, handling, and disposal of ACMs. This report summarizes Tetra Tech's asbestos findings from this survey for the La Salina WWTP. Detailed findings are provided in the enclosed survey report.

Of the 445 samples of suspected ACMs collected by Tetra Tech from the La Salina WWTP, 68 samples tested positive for asbestos or were assumed positive based on a first-stop analysis per sample group. Each of these 68 samples contained more than 1 percent asbestos. No asbestos was identified in the remaining samples that were analyzed. ACM identified during Tetra Tech's sampling surveys were 12"x12" beige floor tiles, black and grey mastic, roof felt, roof penetration mastic, roof parapet wall mastic, beige window putty, beige/gray pipe valve gasket, and transite pipe debris. Presumed asbestos-containing fire doors were also observed at the La Salina WWTP buildings. According to partial as-built drawings prepared by Hirsch and Company dated October 1982 and provided to Tetra Tech for review, below ground asbestos-containing transite pipes are present at the La Salina WWTP.

We appreciate the opportunity to serve you. Please contact us if you have any questions or if we can be of further service.

Sincerely,

TETRA TECH, INC.

DRAFT

NABHAN ODEH
Project Manager
Phone: (949) 809-5076

DRAFT

LONA PEARSON, CAC 13-5051, CLI ID#21287
Cal-OSHA-Certified Asbestos Consultant
CDPH-Certified Lead Inspector/Assessor, Project Monitor

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PRE-DEMOLITION ASBESTOS HAZARDOUS MATERIALS SURVEY REPORT

for

LA SALINA WASTE WATER TREATMENT PLANT
1330 Tait Street
Oceanside, California 92054

Prepared for:

City of Oceanside
1330 Tait Street
Oceanside, California 92054

Prepared by:

Tetra Tech, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, California 92614

Tetra Tech Project No. T35149

December 30, 2015

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Appendix A: Survey Team Certifications
Appendix B: Laboratory Reports, Chain-of-Custody Forms for ACM Samples, and Laboratories' NVLAP Certificates

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1.0 INTRODUCTION

The City of Oceanside retained Tetra Tech, Inc. (Tetra Tech) to perform a pre-demolition asbestos hazardous materials survey (also referenced as the asbestos survey or ACM survey) of the La Salina Waste Water Treatment Plant (WWTP) located at 1330 South Tait Street, Oceanside, California (Site). The survey was a prerequisite to a planned demolition of the La Salina WWTP and involved collecting and analyzing samples of suspected asbestos-containing materials (ACM).

This pre-demolition asbestos survey was performed for the La Salina WWTP between November 16, 2015 and November 23, 2015.

Tetra Tech's survey team consisted of the following:

- Mr. Geoffrey Mere, Mereson Environmental Services (Mereson), California Certified Asbestos Consultant (CAC) and California Department of Public Health- (CDPH-) certified lead–related construction (LRC) Inspector/Risk Assessor (LRCIA) and Project Monitor (LRCPM).

- Mr. Nabhan Odeh, Tetra Tech, General Contractor-Asbestos, and an Asbestos Hazard Emergency Response Act (AHERA) building inspector, contractor/supervisor, management planner, and project designer.

The survey team's certifications are provided in Appendix A.

The surveyors evaluated the interior and exterior areas within the La Salina WWTP (also referred to as the Site) for the presence, location, quantity, and characterization of ACM that might require pre-demolition abatement in accordance with National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations (Title 40 of the *Code of Federal Regulations*, Part 61 [40 CFR Part 61]), as adopted by the United States Environmental Protection Agency (USEPA). The intent of the asbestos NESHAP regulations is to protect the public and workers by minimizing the release of asbestos fibers during activities that involve processing, handling, and disposal of ACM.

This survey report presents findings for ACM from the current asbestos survey (November 16, 2015 to November 23, 2015) performed for the La Salina WWTP by Tetra Tech. Section 2.0 of this report describes the Site structures. Section 3.0 discusses field surveys and analytical protocols. Section 4.0 presents findings. Section 5.0 provides recommendations based on the findings of Tetra Tech's asbestos surveys. Section 6.0 provides a regulatory overview for asbestos.

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2.0 SITE STRUCTURES

The Site consists of several structures, including a single-story administration office building, two single-story maintenance buildings, single- and two-story waste water and sludge treatment buildings, below ground waste water treatment systems, waste water aboveground storage tanks, and below ground waste water pump stations systems. The Site buildings and systems are constructed of a combination of concrete masonry unit (CMU), stucco, reinforced concrete, and wood and metal frames. The floors of the Site buildings are concrete slab-on-grade. The buildings' roof systems are a combination of wood and steel frames, and wood and corrugated metal roof decks. The roof membrane cap consists of a combination of built-up composite and asphaltic shingles over plywood and/or tan lightweight cementitious material. The Site buildings' interior walls are constructed of wood and metal frames.

3.0 ASBESTOS FIELD SURVEY AND ANALYTICAL PROTOCOLS

The field survey and analytical protocols for the asbestos surveys are discussed below.

Tetra Tech inspected the interior and exterior areas of the La Salina WWTP buildings and systems that will be disturbed during demolition. Minor demolition of materials was required during the asbestos survey effort. The inspectors took care to see that the immediate sampling areas within the La Salina WWTP buildings and systems remained unoccupied when samples were collected. Bulk samples of suspected ACM were collected during this survey. Suspected ACM were grouped as homogeneous areas if the material was similar in appearance and texture; however, the inspectors distinguished the material as unique, and collected samples of each distinct material, if they decided that a material (for example, gypsum board) was not similar in appearance and texture to other materials discovered in each building at the Site. The suspected ACMs were classified in accordance with the protocol recommended in Title 40 of the CFR, Part 763, Asbestos-Containing Materials in Schools; Final Rule and Notice (40 CFR 763, Subpart F). Representative bulk samples were collected from each observed homogeneous and unique material.

Bulk samples of suspected ACM were sampled with the intent that each distinct layer of material be collected. A wetting agent was applied to friable surfaces before the sample was collected to reduce the potential for fiber release. All samples were placed in plastic bags, labeled, and sealed immediately after they were collected. After each sample was collected, the sampling instruments were wiped clean using a wet, lint-free cloth to prevent cross-contamination between samples. A unique sample identification number was assigned to each sample.

The samples remained in the inspectors' custody until they were sent to the laboratory. When sampling was complete, the bulk samples were shipped to LA Testing, Inc. (LA Testing) in Garden Grove, California, and EMSL Analytical, Inc. (EMSL) in Pasadena, California, by Federal Express along with completed laboratory chain-of-custody documentation. LA Testing and EMSL are sister companies and are both accredited by the National Institute of Standards and Technology (NIST) and participate in the National Voluntary Laboratory Accreditation Program (NVLAP). Bulk asbestos samples were analyzed using polarized light microscopy (PLM) in accordance with the USEPA-recommended test method described in 40 CFR 763, Subpart F.

Appendix B of this report provides the ACM analytical results and chain-of-custody forms for the bulk samples, as well as the laboratories' NVLAP certificates.

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4.0 CURRENT ACM SURVEY RESULTS

Survey and analytical findings for the ACM samples are summarized below.

4.1 SAMPLED SUSPECT ACM

The PLM results for the ACM samples from the November 16, 2015 through November 23, 2015 asbestos surveys are summarized in Table 1 below; the complete analytical results are provided in the laboratory reports included as Appendix B. Results in Table 1 in bold type indicate that asbestos was detected.

Table 1. PLM Results for ACM Samples

Building	Sample Location	Laboratory Report No.	Sample ID	Material Description	Analytical Result (% Asbestos)
Administration/ Control Building	**Hallway**	**321524390-0001**	**001-1-VFT**	**Beige Speckled 12"x12" VFT**	**6**
	Hallway	**321524390-0001A**	**001-1-Mastic**	**Black Mastic**	**10**
	Laboratory Southwest	**321524390-0002**	**001-2**	**Beige Speckled 12"x12" VFT with Mastic**	**NA**
	Office	**321524390-0003**	**001-3**	**Beige Speckled 12"x12" VFT with Mastic**	**NA**
	Electrical Room	321524390-0004	002-1-VFT	Grey Speckled 12"x12" VFT	ND
	Electrical Room	**321524390-0004A**	**002-1-Mastic**	**Black Mastic**	**5**
	Electrical Room	321524390-0005	002-2-VFT	Gray Speckled 12"x12" VFT	ND
	Electrical Room	**321524390-0005A**	**002-2-Mastic**	**Black Mastic**	**NA**
	Electrical Room	321524390-0006	002-2-VFT	Gray Speckled 12"x12" VFT	ND
	Electrical Room	**321524390-0006A**	**002-2-Mastic**	**Black Mastic**	**NA**
	Electrical Room	321524390-0007	003-1-Basecove	Brown 4" Cove Base	ND
	Electrical Room	321524390-0007A	003-1-Mastic	Brown Mastic	ND
	Restroom East Hallway	321524390-0008	003-2-Basecove	Brown 4" Cove Base	ND
	Restroom East. Hallway	321524390-0008A	003-2-Mastic	Brown Mastic	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Restroom West Hallway	321524390-0009	003-3-Basecove	Brown 4" Cove Base	ND
	Restroom West Hallway	321524390-0009A	003-3-Mastic	Brown Mastic	ND
	Electrical Room, Southeast	321524390-0010	004-1-Basecove	Black 3" Cove Base	ND
	Electrical Room, Southeast	321524390-0010A	004-1-Mastic	Brown/Yellow Mastic	ND
	Electrical Room, Southwest	321524390-0011	004-2-Basecove	Black 3" Cove Base	ND
	Electrical Room, Southwest	321524390-0011A	004-2-Mastic	Brown/Yellow Mastic	ND
	Electrical Room, Near Rear Exit	321524390-0012	004-3-Basecove	Black 3" Cove Base	ND
	Electrical Room, Near Rear Exit	321524390-0012A	004-3-Mastic	Brown/Yellow Mastic	ND
	Crew Room, Northeast Portion	321524390-0013	005-1-Basecove	Brown 3" Cove Base	ND
	Crew Room, Northeast Portion	321524390-0013A	005-1-Mastic	Brown Mastic	ND
	Hallway Near Door, East Portion	321524390-0014	005-2-Basecove	Brown 3" Cove Base	ND
	Hallway Near Door, East Portion	321524390-0014A	005-2-Mastic	Brown Mastic	ND
	Hallway, West Wall	321524390-0015	005-3-Basecove	Brown 3" Cove Base	ND
	Hallway, West Wall	321524390-0015A	005-3-Mastic	Brown Mastic	ND
	Restroom, West Floor	321524390-0016	006-1-Floor Ceramic	Beige 2"x2" Ceramic Tile	ND
	Restroom, West Floor	321524390-0016A	006-1-Grout	Gray Grout	ND
	Restroom, West Floor	321524390-0016B	006-1-Mastic	Yellow Mastic	ND
	Restroom, East Floor	321524390-0017	006-2-Floor Ceramic	Beige 2"x2" Ceramic Tile	ND
	Restroom, East Floor	321524390-0017A	006-2-Grout	Gray Grout	ND
	Restroom, East Floor	321524390-0017B	006-2-Mastic	Yellow Mastic	ND
	Restroom, East Floor	321524390-0017C	006-2-Caulk	Clear Caulk	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Restroom, East Floor	321524390-0018	006-3-Floor Ceramic	Beige 2"x2" Ceramic Tile	ND
	Restroom, East Floor	321524390-0018A	006-3-Grout	Brown Grout	ND
	Restroom, East Floor	321524390-0018B	006-3-Mastic	Beige Mastic	ND
	Restroom, East Floor	321524390-0019	007-1-Floor Ceramic	Beige-Pink 4"x4" Ceramic Tile	ND
	Restroom, East Floor	321524390-0019A	007-1-Grout 1	Gray Grout	ND
	Restroom, East Floor	321524390-0019B	007-1-Grout 2	White Grout	ND
	Restroom, West Floor	321524390-0020	007-2-Ceramic Tile	Beige-Pink 4"x4" Ceramic Tile	ND
	Restroom, West Floor	321524390-0020A	007-2-Grout 1	Gray Grout	ND
	Restroom, West Floor	321524390-0020B	007-2-Grout 2	White Grout	ND
	Restroom, West Floor	321524390-0021	007-3-Ceramic Tile	Beige-Pink 4"x4" Ceramic Tile	ND
	Restroom, West Floor	321524390-0021A	007-3-Grout 1	Gray Grout	ND
	Restroom, West Floor	321524390-0021B	007-3-Grout 2	White Grout	ND
	Janitor's Closet	321524390-0022	008-1-Wall Ceramic	Beige 4"x4" Ceramic Tile	ND
	Janitor's Closet	321524390-0022A	008-1-Grout 1	Tan Grout	ND
	Janitor's Closet	321524390-0022B	008-1-Grout 2	Gray Grout	ND
	Janitor's Closet	321524390-0023	008-2-Wall Ceramic	Beige 4"x4" Ceramic Tile	ND
	Janitor's Closet	321524390-0023A	008-2-Grout 1	Tan Grout	ND
	Janitor's Closet	321524390-0023B	008-2-Grout 2	Gray Grout	ND
	Janitor's Closet	321524390-0024	008-3-Wall Ceramic	Beige 4"x4" Ceramic Tile	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Janitor's Closet	321524390-0024A	008-3-Grout 1	Tan Grout	ND
	Janitor's Closet	321524390-0024B	008-3-Grout 2	Gray Grout	ND
	Restroom West Shower	321524390-0025	009-1-Ceramic Tile	Gray 1"x1" Ceramic Tile	ND
	Restroom West Shower	321524390-0025A	009-1-Grout 1	Brown Grout	ND
	Restroom West Shower	321524390-0025B	009-1-Grout 2	Gray Grout	ND
	Restroom West Shower	321524390-0025C	009-1-Mastic	Yellow Mastic	ND
	Restroom West Shower	321524390-0025D	009-1-Caulk	Clear Caulk	ND
	Restroom, West Shower	321524390-0026	009-2-Ceramic Tile	Grey 1"x1" Ceramic Tile	ND
	Restroom, West Shower	321524390-0026A	009-2-Grout 1	Brown Grout	ND
	Restroom, West Shower	321524390-0026B	009-2-Grout 2	Grey Grout	ND
	Restroom, West Shower	321524390-0026C	009-2-Mastic	Yellow Mastic	ND
	Restroom, West Shower	321524390-0026D	009-2-Caulk	Clear Caulk	ND
	Restroom, East Shower	321524390-0027	009-3-Ceramic Tile	Grey 1"x1" Ceramic Tile	ND
	Restroom, East Shower	321524390-0027A	009-3-Grout	White Grout	ND
	Restroom, East Shower	321524390-0027B	009-3-Mastic	Yellow Mastic	ND
	Janitor's Closet	321524390-0028	010-1-Drywall	Beige Drywall	ND
	Janitor's Closet	321524390-0028A	010-1-Joint Compound	Beige Joint Compound	ND
	Electrical Room, Near Exit	321524390-0029	010-2-Drywall	Beige Drywall	ND
	Electrical Room, Near Exit	321524390-0029A	010-2-Joint Compound	Beige Joint Compound	ND
	Electrical Room, Near West Exit	321524390-0030	010-3-Drywall	Beige Drywall	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Electrical Room, Near West Exit	321524390-0030A	010-3-Joint Compound	Beige Joint Compound	ND
	Office, East Wall	321524390-0031	010-4-Drywall	Beige Drywall	ND
	Office, East Wall	321524390-0031A	010-4-Joint Compound	Beige Joint Compound	ND
	Restroom, West Hallway	321524390-0032	010-5-Drywall	Beige Drywall	ND
	Restroom, West Hallway	321524390-0032A	010-5-Joint Compound	Beige Joint Compound	ND
	Restroom, East Door	321524390-0033	011-1	Beige Joint Compound	ND
	Hallway Restaurant, East Door	321524390-0034	011-2	Beige Joint Compound	ND
	Laboratory, West Door	321524390-0035	011-3	Beige Joint Compound	ND
	Laboratory, Near Door	321524390-0036	011-4	Beige Joint Compound	ND
	Janitorial Closet	321524390-0037	011-5	Beige Joint Compound	ND
	Hallway, West End	321524390-0038	012-1	Grey Fissured 2'X4' Ceiling Tile	ND
	Hallway, East End	321524390-0039	012-2	Grey Fissured 2'X4' Ceiling Tile	ND
	Office, Northwest Portion	321524390-0040	012-3	Grey Fissured 2'X4' Ceiling Tile	ND
	Electrical Room, Near West Exit	321524390-0041	012-4	Grey Fissured 2'X4' Ceiling Tile	ND
	Electrical Room, Near West Wall	321524390-0042	012-5	Grey Fissured 2'X4' Ceiling Tile	ND
	Laboratory, Near Exit	321524390-0043	013-1	Grey Pinpoint Fissured 2'X4' Ceiling Tile	ND
	Laboratory, Near Middle	321524390-0044	013-2	Grey Pinpoint Fissured 2'X4' Ceiling Tile	ND
	Laboratory, Northwest Corner	321524390-0045	013-3	Grey Pinpoint Fissured 2'X4' Ceiling Tile	ND
	Near Main Entry	321524390-0046	014-1-Finish Coat	White Exterior Stucco	ND
	Near Main Entry	321524390-0046A	014-1-Base Coat	White Exterior Stucco	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Northwest Corner	321524390-0047	014-2-Finish Coat	White Exterior Stucco	ND
	Northwest Corner	321524390-0047A	014-2-Base Coat	White Exterior Stucco	ND
	West Side Near Middle	321524390-0048	014-3-Finish Coat	White Exterior Stucco	ND
	West Side Near Middle	321524390-0048A	014-3-Base Coat	White Exterior Stucco	ND
	Southwest Side	321524390-0049	014-4-Finish Coat	White Exterior Stucco	ND
	West Side Near Middle	321524390-0049A	014-4-Base Coat	White Exterior Stucco	ND
	Southeast Corner	321524390-0050	014-5-Finish Coat	White Exterior Stucco	ND
	Southeast Corner	321524390-0050A	014-5-Base Coat	White Exterior Stucco	ND
	Roof Mansard, Northwest	321524390-0051	015-1	Black Roof Felt	ND
	Roof Mansard, Northwest, West Side	321524390-0052	015-2	Black Roof Felt	ND
	Roof Mansard, West Side Near Middle	321524390-0053	015-3	Black Roof Felt	ND
	North Roof	321524390-0054	016-1-Roof Core	Black Roof Core	ND
	North Roof	321524390-0054A	016-1-Felt 1	Black Roof Core	ND
	North Roof	**321524390-0054B**	**016-1-Felt 2**	**Black Roof Core**	**20**
	North Roof, Middle	321524390-0055	016-2-Roof Core	Black Roof Core	ND
	North Roof, Middle	**321524390-0055A**	**016-2-Felt 2**	**Black Roof Core**	**NA**
	North Roof, South End	321524390-0056	016-3-Roof Core	Black Roof Core	ND
	North Roof, South End	321524390-0056A	016-3-Felt 1	Black Roof Core	ND
	North Roof, South End	**321524390-0056B**	**016-3-Felt 2**	**Black Roof Core**	**NA**
	Roof, West Side	**321524390-0057**	**017-1-Roof Mastic**	**Black Roof Parapet Core**	**3**

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Roof, West Side	321524390-0057A	017-1-Shingle 1	Black Roof Parapet Core	ND
	Roof, West Side	321524390-0057B	017-1-Shingle 2	Black Roof Parapet Core	ND
	Roof, West Side	321524390-0057C	017-1-Shingle 3	Black Roof Parapet Core	ND
	Roof, West Side	321524390-0057D	017-1-Shingle 4	Black Roof Parapet Core	ND
	Roof, West Side	**321524390-0057E**	**017-1-Felt**	**Black Roof Parapet Core**	**20**
	Roof, East Side	321524390-0058	017-2-Shingle 1	Black Roof Parapet Core	ND
	Roof, East Side	321524390-0058A	017-2-Shingle 2	Black Roof Parapet Core	ND
	Roof, East Side	321524390-0058B	017-2-Shingle 3	Black Roof Parapet Core	ND
	Roof, East Side	**321524390-0058C**	**017-2-Felt**	**Black Roof Parapet Core**	**NA**
	Roof, Middle	321524390-0059	017-3-Shingle 1	Black Roof Parapet Core	ND
	Roof, Middle	321524390-0059A	017-3-Shingle 2	Black Roof Parapet Core	ND
	Roof, Middle	321524390-0059B	017-3-Shingle 3	Black Roof Parapet Core	ND
	Roof, Middle	**321524390-0059C**	**017-3-Felt**	**Black Roof Parapet Core**	**NA**
	Roof, Middle	**321524390-0060**	**018-1**	**Black Roof Penetrations**	**2**
	Roof, South Side	**321524390-0061**	**018-2**	**Black Roof Penetration**	**NA**
	Roof, North Side	**321524390-0062**	**018-3**	**Black Roof Penetration**	**NA**
Dissolved Air Floatation (DAF) Building	Exterior Water Pump/Valves	321524390-0001	001-1	Green/Beige Gasket	ND
	Exterior Water Pump/Valves	321524390-0002	001-2	Green/Beige Gasket	ND
	Exterior Water Pump/Valves	321524390-0003	001-3	Green/Beige Gasket	ND
	Top Level Floor	321524390-0004	002-1	Grey Perimeter Coating	ND
	Top Level Floor	321524390-0005	002-2	Grey Perimeter Coating	ND
	Top Level Floor	321524390-0006	002-3	Grey Perimeter Coating	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Top Level Floor	321524390-0007	003-1-Coating	Yellow Perimeter Gasket	ND
	Top Level Floor	321524390-0007A	003-1-Cementitious Material	Yellow Perimeter Gasket	ND
	Top Level Floor	321524390-0008	003-2	Yellow Perimeter Gasket	ND
	Top Level Floor	321524390-0009	003-3	Yellow Perimeter Gasket	ND
	Top Level Walkway	321524390-0010	004-1	Grey Cementitious Material	ND
	Top Level Walkway	321524390-0011	004-2	Grey Cementitious Material	ND
	Top Level Walkway	321524390-0012	004-3	Grey Cementitious Material	ND
WAS Thickener Building	**Roof, North Side**	**321524390-0013**	**005-1-Roofing 1**	**Black Roof Core**	**15**
	Roof, North Side	**321524390-0013A**	**005-1-Roofing 2**	**Black Roof Core**	**15**
	Roof, North Side	**321524390-0013B**	**005-1-Roofing 3**	**Black Roof Core**	**15**
	Roof, North Side	**321524390-0013C**	**005-1-Felt**	**Black Roof Core**	**25**
	Roof, South Side	**321524390-0014**	**005-2-Felt 1**	**Black Roof Core**	**NA**
	Roof, South Side	**321524390-0014A**	**005-2-Felt 2**	**Black Roof Core**	**NA**
	Roof, South Side	**321524390-0014B**	**005-2-Felt 3**	**Black Roof Core**	**NA**
	Roof, South Side	**321524390-0014C**	**005-2-Felt 4**	**Black Roof Core**	**NA**
	Roof, Middle	321524390-0015	005-3-Roofing	Black Roof Core	ND
	Roof, Middle	**321524390-0015**	**005-3-Felt 1**	**Black Roof Core**	**NA**
	Roof, Middle	**321524390-0015**	**005-3-Felt 2**	**Black Roof Core**	**NA**
	Roof, Middle	**321524390-0015**	**005-3-Felt 3**	**Black Roof Core**	**NA**
	Roof, Middle	**321524390-0015**	**005-3-Felt 4**	**Black Roof Core**	**NA**
	Roof, South Parapet	321524390-0016	006-1-Shingle	Black/Grey Roof Parapet Core	ND
	Roof, South Parapet	**321524390-0016**	**006-1-Felt 1**	**Black/Grey Roof Parapet Core**	**25**

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Roof, South Parapet	**321524390-0016**	**006-1-Felt 2**	**Black/Grey Roof Parapet Core**	**20**
	Roof, South Parapet	**321524390-0016**	**006-1-Felt 3**	**Black/Grey Roof Parapet Core**	**25**
	Roof, South Parapet	**321524390-0016**	**006-1-Felt 4**	**Black/Grey Roof Parapet Core**	**25**
	Roof, West Parapet	321524390-0017	006-2	Black/Grey Roof Parapet Core	ND
	Roof, East Parapet	321524390-0018	006-3-Shingle	Black/Grey Roof Parapet Core	ND
	Roof, East Parapet	321524390-0018A	006-3-Tar	Black/Grey Roof Parapet Core	ND
	Roof, South Side	321524390-0019	007-1	Black Penetration Mastic	ND
	Roof, North Roof Hatch	**321524390-0020**	**007-2**	**Black Penetration Mastic**	**10**
	Roof, Southwest Side	**321524390-0021**	**007-3**	**Black Penetration Mastic**	**NA**
Primary/Secondary Digester	Primary Digester, Near Top of Tank	321524396-0001	001-1	Grey Penetration Coating	ND
	Primary Digester, Near Top of Tank	321524396-0002	001-2	Core Perimeter Coating	ND
	Primary Digester, Near Top of Tank	321524396-0003	001-3	Core Perimeter Coating	ND
	Primary, Top of Stairwell	321524390-0004	002-1-Coating	Yellow Mastic Coating	ND
	Primary, Top of Stairwell	321524390-0004A	002-1-Cementitious Material	Gray Mastic Coating	ND
	Primary, Top of Stairwell	321524390-0005	002-2-Coating	Yellow Mastic Coating	ND
	Primary, Top of Stairwell	321524390-0005A	002-2-Cementitious Material	Gray Mastic Coating	ND
	Primary, Top of Stairwell	321524390-0006	002-3-Coating	Yellow Mastic Coating	ND
	Primary, Top of Stairwell	321524390-0006A	002-3-Cementitious Material	Gray Mastic Coating	ND
	Secondary/Top of Tank	321524390-0007	003-1	Black Coating	ND
	Hydrogen Peroxide Tank	321524390-0008	004-1	Grey Gasket	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
North Aeration	East Side of North Aeration	321524662-0001	001-1-Insulation	Silver/Grey Pipe Insulation	ND
	South Side of North Aeration	321524662-0001A	001-1-Wrap	Silver/Grey Pipe Insulation	ND
	West Side of North Aeration	321524662-0001B	001-1-Dampener	Silver/Grey Pipe Insulation	ND
	East Side of North Aeration	321524662-0002	001-2-Insulation	Silver/Grey Pipe Insulation	ND
	South Side of North Aeration	321524662-0002A	001-2-Dampener	Silver/Grey Pipe Insulation	ND
	West Side of North Aeration	321524662-0002B	001-2-Paint/Adhesive	Silver/Grey Pipe Insulation	ND
	East Side of North Aeration	321524662-0003	001-3-Insulation	Silver/Grey Pipe Insulation	ND
	South Side of North Aeration	321524662-0003A	001-3-Wrap	Silver/Grey Pipe Insulation	ND
	West Side of North Aeration	321524662-0003B	001-3-Dampener	Silver/Grey Pipe Insulation	ND
	Outside Water Pump	321524662-0004	002-1-Dampener	Beige/Grey	ND
	Outside Water Pump	321524662-0004A	002-1-Insulation	Beige/Grey	ND
	Outside Water Pump	321524662-0004B	002-1-Wrap	Beige/Grey	ND
	North Aeration, Pump Room	321524662-0005	002-2-Dampener	Silver/Grey Noise Dampener	ND
	North Aeration, Pump Room	321524662-0005A	002-2-Wrap 1	Silver/Grey Noise Dampener	ND
	North Aeration, Pump Room	321524662-0005B	002-2-Wrap 2	Silver/Grey Noise Dampener	ND
	North Aeration, Pump Room	321524662-0006	002-3-Wrap	Silver/Grey Noise Dampener	ND
	North Aeration, Pump Room	321524662-0006A	002-3-Insulation	Silver/Grey Noise Dampener	ND
	Outside Water Pump Valve	**321524662-0007**	**003-1**	**Beige/Grey Pump Valve Gasket**	**40**
	Outside Water Pump Valve	**321524662-0008**	**003-2**	**Beige/Grey Pump Valve Gasket**	**NA**
	Outside Water Pump Valve	**321524662-0009**	**003-3**	**Beige/Grey Pump Valve Gasket**	**NA**
	Pump Room Roof, North Side	321524662-0010	004-1-Composit	Black Roof Core	ND
	Pump Room Roof, South Side	321524662-0011	004-2-Composit	Black Roof Core	ND
	Pump Room Roof, Middle	321524662-0012	004-3-Composit	Black Roof Core	ND
	Pump Room Roof	**321524662-0013**	**005-1**	**Black/Grey Penetration Mastic**	**10**

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Pump Room Roof	**321524662-0014**	**005-2**	**Black/Grey Penetration Mastic**	**NA**
	Pump Room Roof	**321524662-0015**	**005-3**	**Black/Grey Penetration Mastic**	**NA**
Barminuter & Grit (BG) Chamber	Open Underground Storage Tank/Sump	321524662-0016	006-1-Coating	Yellow/Wall Floor Coating	ND
	Open Underground Storage Tank/Sump	321524662-0016A	006-1-Cementitious Material	Yellow/Wall Floor Coating	ND
	Open Underground Storage Tank/Sump	321524662-0017	006-2	Yellow/Wall Floor Coating	ND
	Open Underground Storage Tank/Sump	321524662-0018	006-3-Coating	Yellow/Wall Floor Coating	ND
	Open Underground Storage Tank/Sump	321524662-0018A	006-3-Cementitious Material	Yellow/Wall Floor Coating	ND
North Primary Clarifier	South Side	321524662-0019	007-1	Grey Sealant Mastic	ND
	West Side	321524390-0020	007-2	Grey Sealant Mastic	ND
	East Side	321524662-0021	007-3	Grey Sealant Mastic	ND
South Primary Clarifier	South Side	321524662-0022	008-1	Grey Sealant Mastic	ND
	North Side	321524662-0023	008-2	Grey Sealant Mastic	ND
	West Side	321524662-0024	008-3	Grey Sealant Mastic	ND
Maintenance Building	Roof North End	321524662-0025	009-1-Composit	Black Roof Core	ND
	Roof Middle	321524662-0026	009-2-Composit	Black Roof Core	ND
	Roof South End	321524662-0027	009-3-Composit	Black Roof Core	ND
	North Window	321524662-0028	010-1	White Caulking	ND
	South Window	321524662-0029	010-2	White Caulking	ND
	West Window	321524662-0030	010-3	White Caulking	ND
	Exterior South Wall	321524662-0031	011-1	Black Vapor Barrier Paper	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Exterior South Wall	321524662-0032	011-2	Black Vapor Barrier Paper	ND
	Exterior South Wall	321524662-0033	011-3	Black Vapor Barrier Paper	ND
Blower Building	Near West Corner	321524662-0034	012-1-Insulation	Silver/Grey Pipe Insulation	ND
	Near West Corner	321524662-0034A	012-1-Wrap	Silver/Grey Pipe Insulation	ND
	Near West Corner	321524662-0034B	012-1-Dampener	Silver/Grey Pipe Insulation	ND
	South End	321524662-0035	012-2-Wrap	Silver/Grey Pipe Insulation	ND
	Middle	321524662-0036	012-3-Wrap	Silver/Grey Pipe Insulation	ND
	West Side Wall	321524662-0037	013-1-Finish Coat	Beige/Silver Stucco	ND
	West Side Wall	321524662-0037A	013-1-Base Coat	Beige/Silver Stucco	ND
	East Side Wall	321524662-0038	013-2-Finish Coat	Beige/Silver Stucco	ND
	East Side Wall	321524662-0038A	013-2-Base Coat	Beige/Silver Stucco	ND
	South Side Wall	321524662-0039	013-3-Finish Coat	Beige/Silver Stucco	ND
	South Side Wall	321524662-0039A	013-3-Base Coat	Beige/Silver Stucco	ND
	Roof soffit, East Corner	321524662-0040	014-1	Black Roof Felt	ND
	Roof soffit, South	321524662-0041	014-2	Black Roof Felt	ND
	Roof Soffit, Southeast	321524662-0042	014-3	Black Roof Felt	ND
	Roof North End	321524662-0043	015-1	Black Roof Core	ND
	Roof South End	321524662-0044	015-2-Composit	Black Roof Core	ND
	Roof Middle	321524662-0045	015-3	Black Roof Core	ND
	Near Roof Hatch	321524662-0046	016-1	Black Penetration Mastic	ND
	Roof North End	**321524662-0047**	**016-2**	**Black Penetration Mastic**	**3**
	Roof South End	**321524662-0048**	**016-3**	**Black Penetration Mastic**	**NA**
	Roof South Parapet Wall/End	321524662-0049	017-1-Composit	Black Parapet Core	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Roof North Parapet Wall/End	321524662-0050	017-2-Composit	Black Parapet Core	ND
	Roof West Parapet Wall/End	321524662-0051	017-3-Composit	Black Parapet Core	ND
Abandoned Primary Digester (APD) Aboveground Storage Tank	**APD Room, East Side Window**	**321524662-0052**	**018-1**	**Beige Putty**	**2**
	APB Room, East Side Window	**321524662-0053**	**018-2**	**Beige Putty**	**NA**
	APB Room, East Side Window	**321524662-0054**	**018-3**	**Beige Putty**	**NA**
	APB Room, Pump Lining	321524662-0055	019-1	Grey Inner Pump Lining	ND
	APB Room, Pump Lining	321524662-0056	019-2	Grey Inner Pump Lining	ND
	APB Room, Pump Lining	321524662-0057	019-3	Grey Inner Pump Lining	ND
	APB Roof, South End	321524662-0058	020-1	Black Roof Core	ND
	APB Roof, North End	321524662-0059	020-2	Black Roof Core	ND
	APB Roof, Middle	321524662-0060	020-3	Black Roof Core	ND
	APB, Roof, North End	**321524662-0061**	**021-1**	**Black Roof Penetration**	**10**
	APB, Roof, South End	**321524662-0062**	**021-2**	**Black Roof Penetration**	**NA**
	APB, Roof, North End	**321524662-0063**	**021-3**	**Black Roof Penetration**	**NA**
Abandoned Secondary Digester (ASD) Aboveground Storage Tank	Abandoned SEC Digester, East Perimeter	321524662-0064	022-1	Black Vapor Barrier Paper	ND
	Abandoned SEC Digester, East Perimeter	321524662-0065	022-2	Black Vapor Barrier Paper	ND
	Abandoned SEC Digester, East Perimeter	321524662-0066	022-3	Black Vapor Barrier Paper	ND
Reclaimed Water Pump (RWP) Station	RWP Station, South End	321524662-0067	023-1	Grey Pump Gasket	ND
	RWP Station, Near North End	321524662-0068	023-2	Grey Pump Gasket	ND
	RWP Station, Near Middle	321524662-0069	023-3	Grey Pump Gasket	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
Sludge Dewatering Building (SDB)	Roof North End	321524661-0001	001-1	Black Roof Core	ND
	Roof South End	321524661-0002	001-2	Black Roof Core	ND
	Roof Middle	321524661-0003	001-3	Black Roof Core	ND
	Roof North End	**321524661-0004**	**002-1-Mastic**	**Black/Grey Penetration Mastic**	**10**
	Roof North End	321524661-0004A	002-1-Roofing	Black Roofing	ND
	Roof South End	**321524661-0005**	**002-2-Mastic**	**Black/Grey Penetration Mastic**	**NA**
	Roof Middle	**321524661-0006**	**002-3-Mastic**	**Black/Grey Penetration Mastic**	**NA**
	4-Foot Diameter Roof Duct	321524390-0007	003-1-Cover	Beige Cover Cloth	ND
	4-Foot Diameter Roof Duct	321524390-0007A	003-1-Caulking	Beige Cover Cloth	ND
	4-Foot Diameter Roof Duct	321524661-0008	003-2	Beige Cover Cloth	ND
	4-Foot Diameter Roof Duct	321524661-0009	003-3	Beige Cover Cloth	ND
	4-Foot Diameter Roof Duct	321524661-0010	004-1	Black Belt Lining	ND
	4-Foot Diameter Roof Duct	321524661-0011	004-2	Black Belt Lining	ND
	4-Foot Diameter Roof Duct	321524661-0012	004-3	Black Belt Lining	ND
	Roof, Southeast	321524661-0013	005-1	Roof Vent Axial Base Lining	ND
	Roof, Southeast	321524661-0014	005-2	Roof Vent Axial Base Lining	ND
	Roof, Southeast	321524661-0015	005-3	Roof Vent Axial Base Lining	ND
	Roof, Southeast	321524661-0016	006-1	Duct Axial Gasket	ND
	Roof, Southeast	321524661-0017	006-2	Duct Axial Gasket	ND
	Roof, Southeast	321524661-0018	006-3	Duct Axial Gasket	ND
	Roof, Northeast	321524661-0019	007-1	White HVAC Duct Insulation	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Roof, Northeast	321524661-0020	007-2	White HVAC Duct Insulation	ND
	Roof, Northeast	321524661-0021	007-3-Wrap	White HVAC Duct Insulation	ND
	Roof, Northeast	321524661-0021	007-3-Insulation	White HVAC Duct Insulation	ND
	Roof, North	321524661-0022	008-1	Parapet Wall Flashing Mastic	ND
	Roof, North	321524661-0023	008-2	Parapet Wall Flashing Mastic	ND
	Roof, Northeast	321524661-0024	008-3	Parapet Wall Flashing Mastic	ND
	Roof, South	321524661-0025	009-1	Parapet Wall Flashing Mastic	ND
	Roof, South	321524661-0026	009-2	Parapet Wall Flashing Mastic	ND
	Roof, West	321524661-0027	009-3	Parapet Wall Flashing Mastic	ND
	Roof, North	321524661-0028	010-1	Parapet Wall Cap Mastic	ND
	Roof, South	321524661-0029	010-2	Parapet Wall Cap Mastic	ND
	Roof, West	321524661-0030	010-3	Parapet Wall Cap Mastic	ND
	First Floor, East Wall	321524661-0031	011-1	Beige Drywall	ND
	Control Room, South Wall	321524661-0032	011-2	Beige Drywall	ND
	Control Room, Northwest Corner	321524390-0033	011-3-Composit	Beige Drywall	ND
	First Floor, East Wall	321524661-0034	012-1	Beige Joint Compound	ND
	First Floor, East Wall	321524661-0035	012-2	Beige Joint Compound	ND
	Control Room, East Wall	321524661-0036	012-3	Beige Joint Compound	ND
	Control Room, Northeast, Near Door	321524661-0037	013-1-Basecove	Brown 3" Cove Base/Mastic	ND
	Control Room, Northeast, Near Door	321524661-0037A	013-1-Mastic	Brown 3" Cove Base/Mastic	ND
	Control Room, Northwest, Near Door	321524661-0038	013-2-Basecove	Brown 3" Cove Base/Mastic	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Control Room, Northwest, Near Door	321524661-0038A	013-2-Mastic	Brown 3" Cove Base/Mastic	ND
	Control Room, Southeast	321524661-0039	013-3-Basecove	Brown 3" Cove Base/Mastic	ND
	Control Room, Southeast	321524661-0039A	013-3-Mastic	Brown 3" Cove Base/Mastic	ND
	2nd Floor, North Air Duct	321524661-0040	014-1	Beige Air Duct Vent Tape	ND
	First Floor, Southwest Corner	321524661-0041	014-2	Beige Air Duct Vent Tape	ND
	First Floor, Northwest	321524661-0042	014-3	Beige Air Duct Vent Tape	ND
	Control Room, Southeast Corner	321524661-0043	015-1-Floor Tile	Tan with Grey Streaks 12"X12" VFT and Mastic	ND
	Control Room, Southeast Corner	321524661-0043A	015-1-Mastic	Tan with Grey Streaks 12"X12" VFT and Mastic	ND
	Control Room, Near Middle	321524661-0044	015-2-Floor Tile	Tan with Grey Streaks 12"X12" VFT and Mastic	ND
	Control Room, Near Middle	321524661-0044A	015-2-Mastic	Tan with Grey Streaks 12"X12" VFT and Mastic	ND
	Control Room, Northwest	321524661-0045	015-3-Floor Tile	Tan with Grey Streaks 12"X12" VFT and Mastic	ND
	Control Room, Northwest	321524661-0045A	015-3-Mastic	Tan with Grey Streaks 12"X12" VFT and Mastic	ND
	Exterior South Side	321524661-0046	016-1-Finish Coat	Beige Stucco	ND
	Exterior South Side	321524661-0046A	016-1-Base Coat	Beige Stucco	ND
	Exterior East Side	321524661-0047	016-2-Finish Coat	Beige Stucco	ND
	Exterior East Side	321524661-0047A	016-2-Base Coat	Beige Stucco	ND
	Exterior Near North Entry	321524661-0048	016-3-Finish Coat	Beige Stucco	ND
	Exterior Near North Entry	321524661-0048A	016-3-Base Coat	Beige Stucco	ND
	Near South Side	321524661-0049	017-1	Beige Window Putty	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	North Entry	321524661-0050	017-2-Window Putty	Beige Window Putty	ND
	North Entry	321524661-0050A	017-2-Cemintitious Material	Beige Window Putty	ND
	North Wall	321524661-0051	017-3-Window Putty	Beige Window Putty	ND
	North Wall	321524661-0051A	017-3-Cementitious Material 1	Beige Window Putty	ND
	North Wall	321524661-0051B	017-3-Cementitious Material 2	Beige Window Putty	ND
	North Side of Tank	321524661-0052	018-1	AST White Coating	ND
	Near North	321524661-0053	018-2-Coating	AST White Coating	ND
	Near North	321524661-0053A	018-2-Thick Rust	AST Brown/Red Coating	ND
	Near North	321524661-0053B	018-2-Caulking	AST Gray Coating	ND
	Near Northeast	321524661-0054	018-3	AST White/Beige Coating	ND
	Tank Base	321524661-0055	019-1	AST Base Mastic	ND
	Tank Base	321524661-0056	019-2	AST Base Mastic	ND
	Tank Base	321524661-0057	019-3	AST Base Mastic	ND
South Aeration Secondary Clarifier (SASC)	Pipe Support Bracket	321524705-0001	001-1	Beige Cementitious Material	ND
	Pipe Support Bracket	321524705-0002	001-2	Beige Cementitious Material	ND
	Pipe Support Bracket	321524705-0003	001-3	Beige Cementitious Material	ND
Headworks	Generator Room, Northwest	321524706-0001	001-1-Composit	Beige Drywall	ND
	Generator Room, West Wall	321524706-0002	001-2-Composit	Beige Drywall	ND
	Electrical Panel Room Ceiling	321524706-0003	001-3-Composit	Beige Drywall	ND
	Generator Room North Wall	321524706-0004	002-1	Beige Joint Compound	ND
	Generator Room, North Wall Middle	321524706-0005	002-2	Beige Joint Compound	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Generator Room, West Well Top	321524706-0006	002-3	Beige Joint Compound	ND
	South Wall, Window/Vent	321524706-0007	003-1	Grey Putty/Caulking	ND
	South Wall, Window/Vent	321524706-0008	003-2	Grey Putty/Caulking	ND
	South Wall, Window/Vent	321524706-0009	003-3	Grey Putty/Caulking	ND
	Generator Room, Southeast	321524706-0010	004-1-Composit	Black Air Duct Vent Sealant Tape Composite	ND
	Generator Room, Southeast	321524706-0011	004-2-Composit	Black Air Duct Vent Sealant Tape Composite	ND
	Generator Room, Southeast	321524706-0012	004-3	Black Air Duct Vent Sealant Tape Composite	ND
	Generator Room, Southeast	321524706-0013	005-1	Black Air Duct Damper Cloth	ND
	Generator Room, Southeast	321524706-0014	005-2	Black Air Duct Damper Cloth	ND
	Generator Room, Southeast	321524706-0015	005-3	Black Air Duct Damper Cloth	ND
	Basement Pump Room	321524706-0016	006-1	Green Pump Gasket	ND
	Basement Pump Room	321524706-0017	006-2	Green Pump Gasket	ND
	Basement Pump Room	321524706-0018	006-3	Green Pump Gasket	ND
	Electrical Panel Room Restroom	321524706-0019	007-1-Ceramic Tile	2"X4" Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0019A	007-1-Grout	2"X4" Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0019B	007-1-Mastic	2"X4" Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0020	007-2-Ceramic Tile	2"X4" Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0020	007-2-Grout	2"X4" Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0021	007-3-Ceramic Tile	2"X4" Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0021	007-3-Grout	2"X4" Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0021	007-3-Mastic	2"X4" Ceramic Floor Tile/Grout	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Electrical Panel Room Restroom	321524706-0022	008-1-Ceramic Tile	6"X6" Grey Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0022A	008-1-Grout	6"X6" Grey Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0022B	008-1-Mastic	6"X6" Grey Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0023	008-2-Ceramic Tile	6"X6" Grey Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0023A	008-2-Grout	6"X6" Grey Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0023B	008-2-Mastic	6"X6" Grey Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524390-0024	008-3-Ceramic Tile	6"X6" Grey Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0024A	008-3-Grout	6"X6" Grey Ceramic Floor Tile/Grout	ND
	Electrical Panel Room Restroom	321524706-0024B	008-3-Thinset	6"X6" Grey Ceramic Floor Tile/Grout	ND
	Sludge Treatment System, South Wall	321524706-0025	009-1	Beige Air Duct Cloth Wrapping	ND
	Sludge Treatment System, South Wall	321524706-0026	009-2	Beige Air Duct Cloth Wrapping	ND
	Sludge Treatment System, South Wall	321524706-0027	009-3	Beige Air Duct Cloth Wrapping	ND
	Roof, Near North	321524706-0028	010-1	Black Roof Core	ND
	Roof, Near Middle	321524706-0029	010-2-Composit	Black Roof Core	ND
	Roof, Near South	321524706-0030	010-3-Composit	Black Roof Core	ND
	Roof, Near North	321524706-0031	011-1	Black Penetration Mastic	ND
	Roof, Near Middle	321524706-0032	011-2	Black Penetration Mastic	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
	Roof, Near South	321524706-0033	011-3	Black Penetration Mastic	ND
	Near Northwest Side	321524706-0034	012-1-Finish Coat	Beige/Grey Exterior Stucco	ND
	Near Northwest Side	321524706-0034A	012-1-Base Coat	Beige/Grey Exterior Stucco	ND
	Near Southwest Side	321524706-0035	012-2	Beige/Grey Exterior Stucco	ND
	South Wall West of Rollup Gate	321524706-0036	012-3-Finish Coat	Beige/Grey Exterior Stucco	ND
	South Wall West of Rollup Gate	321524706-0036A	012-3-Base Coat	Beige/Grey Exterior Stucco	ND
	Near Southeast Wall	321524706-0037	012-4-Finish Coat	Beige/Grey Exterior Stucco	ND
	Near Southeast Wall	321524706-0037A	012-4-Base Coat	Beige/Grey Exterior Stucco	ND
	Near East Wall	321524706-0038	012-5-Finish Coat	Beige/Grey Exterior Stucco	ND
	Near East Wall	321524706-0038A	012-5-Base Coat	Beige/Grey Exterior Stucco	ND
	South Side Sump Cover	321524706-0039	013-1	Beige Cementitious Panel	ND
	South Side Sump Cover	321524706-0040	013-2	Beige Cementitious Panel	ND
	South Side Sump Cover	321524706-0041	013-3	Beige Cementitious Panel	ND
	Vent Base, Northwest Side	321524706-0042	014-1	Black/Beige Tape	ND
	Vent Base, Northwest Side	321524706-0043	014-2	Black/Beige Tape	ND
	Vent Base, Northwest Side	321524390-0044	014-3	Black/Beige Tape	ND
	North Roof, Near Middle	321524706-0045	015-1	Black Roof Felt	ND
	North Roof, Near Northeast	321524706-0046	015-2	Black Roof Felt	ND
	North Roof, Near North	321524706-0047	015-3	Black Roof Felt	ND
	South Side Under Cementitious Panel Sump Cover	321524706-0048	016-1	Black Damper Support	ND
	South Side Under Cementitious Panel Sump Cover	321524706-0049	016-2	Black Damper Support	ND
	South Side Under Cementitious Panel Sump Cover	321524706-0050	016-3	Black Damper Support	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
Load Equalization Tank (LET)	**Sump Box, Northeast Corner of LET**	**321524641-0001**	**001-1**	**Grey Sealant/Mastic**	**15**
	Sump Box, Northeast Corner of LET	**321524641-0002**	**001-2**	**Grey Sealant/Mastic**	**NA**
	Sump Box, Northeast Corner of LET	**321524641-0003**	**001-3**	**Grey Sealant/Mastic**	**NA**
	LET Roof/Top, East Area	321524641-0004	002-1	Water Pipe Fitting, Grey Cementitious Gasket	ND
	LET Roof/Top, East Area	321524641-0005	002-2	Water Pipe Fitting, Grey Cementitious Gasket	ND
	LET Roof/Top, East Area	321524641-0006	002-3	Water Pipe Fitting, Grey Cementitious Gasket	ND
	LET Roof/Top, Northeast Corner	**321524641-0007**	**003-1**	**Grey Penetration**	**12**
	LET Roof/Top, Northeast Corner	**321524641-0007**	**003-2**	**Grey Penetration**	**NA**
	LET Roof/Top, Northeast Corner	**321524641-0007**	**003-3**	**Grey Penetration**	**NA**
	South Side of LET, Valve Control	321524641-0008	004-1	Black/Beige Insulation	ND
	South Side of LET, Valve Control	321524641-0008	004-1	Black/Beige Insulation	ND
	South Side of LET, Valve Control	321524641-0008	004-1	Black/Beige Insulation	ND
	South Side of LET, 6" Pipe	321524641-0009	005-1	Green Gasket	ND
	South Side of LET, 6" Pipe	321524641-0009	005-1	Green Gasket	ND
	South Side of LET, 6" Pipe	321524641-0009	005-1	Green Gasket	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
South Pacific Pump Station	Next to Pump Room Station, Concrete Sump Liner	321524638-0001	001-1-Mastic	Beige/Yellow Mastic	ND
	Next to Pump Room Station, Concrete Sump Liner	321524638-0001A	001-1-Cementitious Material	Gray Cementitious Material	ND
	Next to Pump Room Station, Concrete Sump Liner	321524638-0002	001-2-Mastic	Beige/Yellow Mastic	ND
	Next to Pump Room Station, Concrete Sump Liner	321524638-0002A	001-2-Cementitious Material	Gray Cementitious Material	ND
	Next to Pump Room Station, Concrete Sump Liner	321524638-0003	001-3	Beige/Yellow Mastic	ND
	Pump Station Room Roof Skylight	**321524638-0004**	**002-1**	**Black/Grey Mastic**	**15**
	Pump Station Room Roof Skylight	**321524638-0005**	**002-2**	**Black/Grey Mastic**	**NA**
	Pump Station Roof Skylight	**321524638-0006**	**002-3**	**Black/Grey Mastic**	**NA**
	Pump Station Electric Panel Roof	321524638-0007	003-1-Composit	Black/Grey Roof Core	ND
	Pump Station Electric Panel Roof	321524638-0008	003-2-Composit	Black/Grey Roof Core	ND
	Pump Station Electric Panel Roof	321524638-0009	003-3-Composit	Black/Grey Roof Core	ND
	Pump Station Room Door Jamb	321524638-0010	004-1	Beige Putty	ND
	Pump Station Room Door Jamb	321524638-0011	004-2	Beige Putty	ND
	Pump Station Room Door Jamb	321524638-0012	004-3	Beige Putty	ND

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Table 1. PLM Results for ACM Samples					
Building	**Sample Location**	**Laboratory Report No.**	**Sample ID**	**Material Description**	**Analytical Result (% Asbestos)**
Outfall Pump Station	South Pacific Station Top, East Air Vent	321524640-0001	001-1	Grey Penetration Mastic	ND
	South Pacific Station Top, East Air Vent	321524640-0002	001-2	Grey Penetration Mastic	ND
	South Pacific Station Top, East Air Vent	321524640-0003	001-3	Grey Penetration Mastic	ND
	South Pacific Station Basement, Pump Valve	321524640-0004	002-1	Green Gasket	ND
	South Pacific Station Basement, Pump Valve	321524640-0005	002-2	Green Gasket	ND
	South Pacific Station Basement, Pump Valve	321524640-0006	002-3	Green Gasket	ND
South End of Plant	**Debris Pile, South End of Plant**	**321524639-0001**	**001-1**	**Grey Cementitious Material**	**15-Chrysotile 3-Crocidolite**
	Debris Pile, South End of Plant	**321524639-0002**	**001-2**	**Grey Cementitious Material**	**NA**
	Debris Pile, South End of Plant	**321524639-0003**	**001-3**	**Grey Cementitious Material**	**NA**

Notes:

ACM = asbestos-containing material
NA = not analyzed
ND = asbestos not detected
PLM = polarized light microscopy
VFT = vinyl floor tile

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4.2 PRESUMED ACM

During the asbestos survey, Tetra Tech observed approximately 26 fire doors throughout the La Salina WWTP. Typically, it is less costly to presume that fire doors contain asbestos and it is best to dispose of them, rather than open and sample them in an asbestos-regulated enclosure. Tetra Tech recommends that all fire doors slated for replacement be handled and disposed of as potentially friable ACM. If any fire doors are slated to be retained, their insulated cores can be accessed and sampled before renovation.

Tetra Tech reviewed a partial set of drawings (Treatment Plant Yard Piping Removal, prepared by Hirsch & Company for the City of Oceanside, dated October 1982) for the La Salina WWTP. According to the reviewed drawings, waste water transite piping (ranging from 3 inches to 24 inches in diameter) is present below ground at the La Salina WWTP. Due to access limitations, the on-Site transite piping is assumed to contain asbestos and, therefore, should be abated prior to renovation/demolition activities.

5.0 RECOMMENDATIONS

Recommendations for ACM are provided below.

5.1 CURRENT SURVEY CONFIRMED ACM AND PRESUMED ACM

Sixty-eight of the 445 samples of suspected ACM collected from the Site tested positive for asbestos or were assumed positive on the basis of first-stop analysis per sample group. Each of these 68 samples contained more than 1 percent asbestos. Identified ACM included 12"x12" floor tiles, black/gray mastic, black roof felt, black/gray roof penetration mastic, black roof system core, beige window putty, and transite debris. No asbestos was identified in the remaining samples that were analyzed.

Table 2 below provides a summary of the materials confirmed as containing asbestos, as well as presumed ACM.

5.2 CONFIRMED ACM AND PRESUMED ACM

The results of the asbestos survey performed by Tetra Tech (presented in this report) showed 68 confirmed and two presumed ACMs (transite piping and fire doors). Confirmed and presumed ACMs are summarized in Table 2 below, along with estimated quantities for each material.

Table 2. Summary of Confirmed ACMs and Presumed ACMs from Tetra Tech's Asbestos Survey

Suite	Sample ID	Material Description	Material Locations	Analytical Result	Quantity (SF)
Administration/ Control Building	001-1-VFT	Beige Speckled 12"x12" VFT	Office, Breakroom/ Kitchen, and Hallways	6% Chrysotile	500
	001-1-Mastic	Black Mastic under Beige Speckled 12"x12" VFT	Office, Breakroom/ Kitchen, and Hallways	10% Chrysotile	Included Above
	002-1-Mastic	Black Mastic under Gray Speckled 12"x12" VFT	Electrical Room	5% Chrysotile	330
	016-1-Felt 2	Black Roof Core	Roof System	20% Chrysotile	2,500
	018-1	Black Penetration Mastic	Roof System	2% Chrysotile	100
WAS Thickener Building	005-1-Roofing 1	Black Roof Core	Roof System	15% Chrysotile	2,500
	005-1-Felt	Black Roof Core	Roof System	25% Chrysotile	Included Above
	006-1-Felt 1	Black/Gray Parapet Wall Core	Roof System	25% Chrysotile	1,300
	007-2	Black Penetration Mastic	Roof System	10% Chrysotile	25

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Table 2. Summary of Confirmed ACMs and Presumed ACMs from Tetra Tech's Asbestos Survey					
Suite	**Sample ID**	**Material Description**	**Material Locations**	**Analytical Result**	**Quantity (SF)**
North Aeration	003-1	Beige/Gray Pump Valve Gasket	Outside Water Pump Valve	40% Chrysotile	10
	005-1	Black/Gray Penetration Mastic	Pump Room Roof System	10% Chrysotile	10
Blower Building	016-2	Black Penetration Mastic	Roof System	3% Chrysotile	20
Abandoned Primary Digester (APD)	018-1	Window Beige Putty	APD Aboveground Storage Tank	2% Chrysotile	30 LF
	021-1	Black Penetration Mastic	APB Roof System	10% Chrysotile	20
Sludge Dewatering Building (SDB)	002-1-Mastic	Black/Grey Penetration Mastic	Roof System	10% Chrysotile	400
Load Equalization Tank (LET)	001-1	Grey Sealant Mastic	LET Northeast Corner, Sump Box Cover	15% Chrysotile	25 LF
	003-1	Grey Penetration Mastic	LET Northeast Corner, Air Vent Base	12% Chrysotile	16
South Pacific Pump Station	002-1	Black/Grey Mastic	South Pacific Pump Station Room Skylight	15% Chrysotile	10
South End of Plant	001-1	Grey Cementitious Material/ Transite Debris	South End of Plant	15% Chrysotile, 3% Crocidolite	1 LF
La Salina WWTP	--	3" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	150 LF
La Salina WWTP	--	4" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	300 LF
La Salina WWTP	--	6" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	1,800 LF
La Salina WWTP	--	12" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	200 LF
La Salina WWTP	--	14" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	60 LF
La Salina WWTP	--	16" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	50 LF
La Salina WWTP	--	24" ID Transite Pipe	Multiple Locations/ Below Ground	Presumed ACM	600 LF

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Table 2. Summary of Confirmed ACMs and Presumed ACMs from Tetra Tech's Asbestos Survey					
Suite	**Sample ID**	**Material Description**	**Material Locations**	**Analytical Result**	**Quantity (SF)**
La Salina WWTP	--	Fire Doors	Multiple Locations	Presumed ACM	26 Doors

Notes:

-- = Not Sampled
ACM = Asbestos-Containing Material
ID = Inner Diameter
LF = Linear Foot
SF = Square Foot
VFT = Vinyl Floor Tile

Non-friable ACM identified by the Tetra Tech survey should be removed as friable ACM by a licensed asbestos abatement contractor before renovation/demolition work begins. The waste must be transported to a disposal site that is able to accept non-friable ACM.

Only minor demolition of materials (destructive sampling), which limited the inspection for suspect materials, was employed during the asbestos surveys. Thus, additional suspect materials could be present at the Site in walls, voids, attics, crawl spaces, and other concealed areas. If any suspected ACM that are not listed in the ACM summary table (Table 2) are identified during the renovation/demolition processes, the owner or contractor should employ an AHERA-certified building inspector to obtain representative analytical results, or as an alternative, they should handle and dispose of these materials as presumed ACM (PACM) and follow all Federal Occupational Safety and Health Administration (OSHA) and California Occupational Safety and Health Administration (Cal-OSHA) requirements for protecting workers and building occupants.

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6.0 REGULATORY REVIEW FOR ASBESTOS

Regulatory oversight for the management, removal, and disposal of ACM is provided by a variety of federal, state, and local agencies.

The three primary regulations enforced by regulatory agencies that govern various activities (e.g., inspection, assessment, and abatement) relating to ACM are the following: AHERA, NESHAP, and the Asbestos Standard for the Construction Industry (as codified in federal OSHA and Cal-OSHA regulations) (Construction Standard). USEPA regulations concerning the identification, handling, management, and abatement of ACM (as found in AHERA and NESHAP) are implemented locally by the Southern California Air Quality Management District (AQMD). Both Cal-OSHA and OSHA regulate asbestos as a worker health and safety issue. In addition, the transportation and disposal of asbestos-containing wastes are overseen by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). The federal OSHA, USEPA, DTSC, and AQMD define ACM as a material containing greater than 1 percent asbestos.

Following are brief descriptions of the three major regulations relating to ACM.

Asbestos Hazard Emergency Response Act (AHERA)
AHERA (40 CFR Part 763), as implemented by USEPA, primarily pertains to the assessment and management of ACM in non-profit schools, grades Kindergarten through 12; however, many of the

procedures, training requirements, and certifications defined by AHERA have become the industry standard for all other facilities. For this survey, AHERA protocols were generally used in the identification, assessment, and sampling of building materials suspected of containing asbestos.

National Emission Standard for Hazardous Air Pollutants (NESHAP)
NESHAP (40 CFR Part 61) is an asbestos standard that protects the general public from asbestos exposure due to renovation or demolition activities. NESHAP requires surveying for suspect materials (as defined above), notification of intent to renovate or demolish, removal of regulated ACM (RACM) before renovation or demolition, and proper management of asbestos-containing wastes. An RACM is defined by NESHAP as follows:

- Any friable ACM.
- A Category I non-friable ACM (such as floor tiles and asphalt roofing products) that has become friable or will be subject to sanding, grinding, cutting, or abrading during renovation or demolition activities.
- A Category II non-friable ACM (all other non-friable ACM) that has a high probability of becoming friable during demolition or renovation activities.

NESHAP requires that demolition activities be conducted with no visible emissions using wet methods. Note: While NESHAP regulates renovation and demolition activities, it does not protect individual workers conducting asbestos abatement or provide instructions as to how asbestos abatement projects should be conducted.

Asbestos Standard for the Construction Industry
The Asbestos Standard for the Construction Industry (Construction Standard) (federal OSHA, 29 CFR 1926.1101, and California OSHA, Title 8 California Code of Regulations [CCR] 1529) regulates asbestos exposure in the work place. This includes both persons working in a building that contains ACM and asbestos abatement workers/contractors. For abatement workers and contractors, the Construction Standard regulates the following:

- Protection of workers and the public during the removal.
- Medical surveillance requirements for workers.
- Detailed requirements for how asbestos is to be removed.
- Training requirements for abatement personnel.

California OSHA defines Asbestos Containing Construction Material (ACCM) as any building material that contains more than 0.1 percent (one-tenth of one percent) asbestos by weight. In addition, building materials presumed or known to contain at least trace amounts (not greater than 1 percent) of asbestos should be considered as ACCM and should be managed according to California OSHA regulations (as presented in Title 8 CCR 1529).

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7.0 REFERENCE

Hirsch & Company (1982), Treatment Plant Yard Piping Removal, Prepared for the La Salina Waste Water Treatment Plant, City of Oceanside, dated October 1982.

FIGURES

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SOURCE:

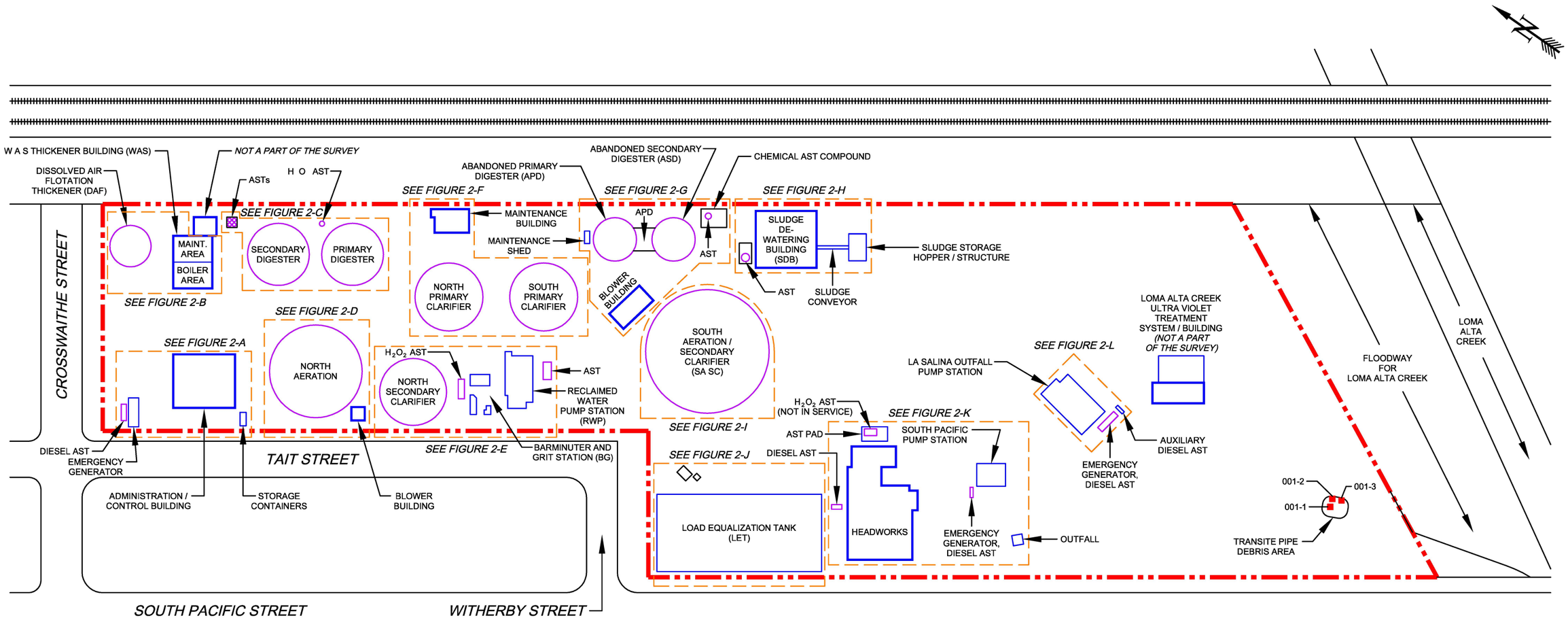
2013 AERIAL PHOTOGRAPH (ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE)

0 200 400

SCALE (FEET)

N

CITY OF OCEANSIDE LA SALINA WASTEWATER TREATMENT PLANT 1330 SOUTH TAIT STREET OCEANSIDE, CALIFORNIA 92054	TETRA TECH DECEMBER 30, 2015 TETRA TECH PROJ. NO. T35149	SITE LOCATION MAP FIGURE 1



LEGEND

SITE BOUNDARY	
AST	ABOVEGROUND STORAGE TANK
H_2O_2	HYDROGEN PEROXIDE
UST	UNDERGROUND STORAGE TANK
RAILROAD TRACK	
001-1 ■	SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
001-1 ■	SAMPLE TESTED POSITIVE FOR ASBESTOS (WITH SAMPLE DESIGNATION)

0 100 200
SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP AND SITE BOUNDARIES DERIVED FROM SAN DIEGO COUNTY ASSESSOR'S MAP; SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010); AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

CITY OF OCEANSIDE
LA SALINA WASTEWATER TREATMENT PLANT
1330 SOUTH TAIT STREET
OCEANSIDE, CALIFORNIA 92054

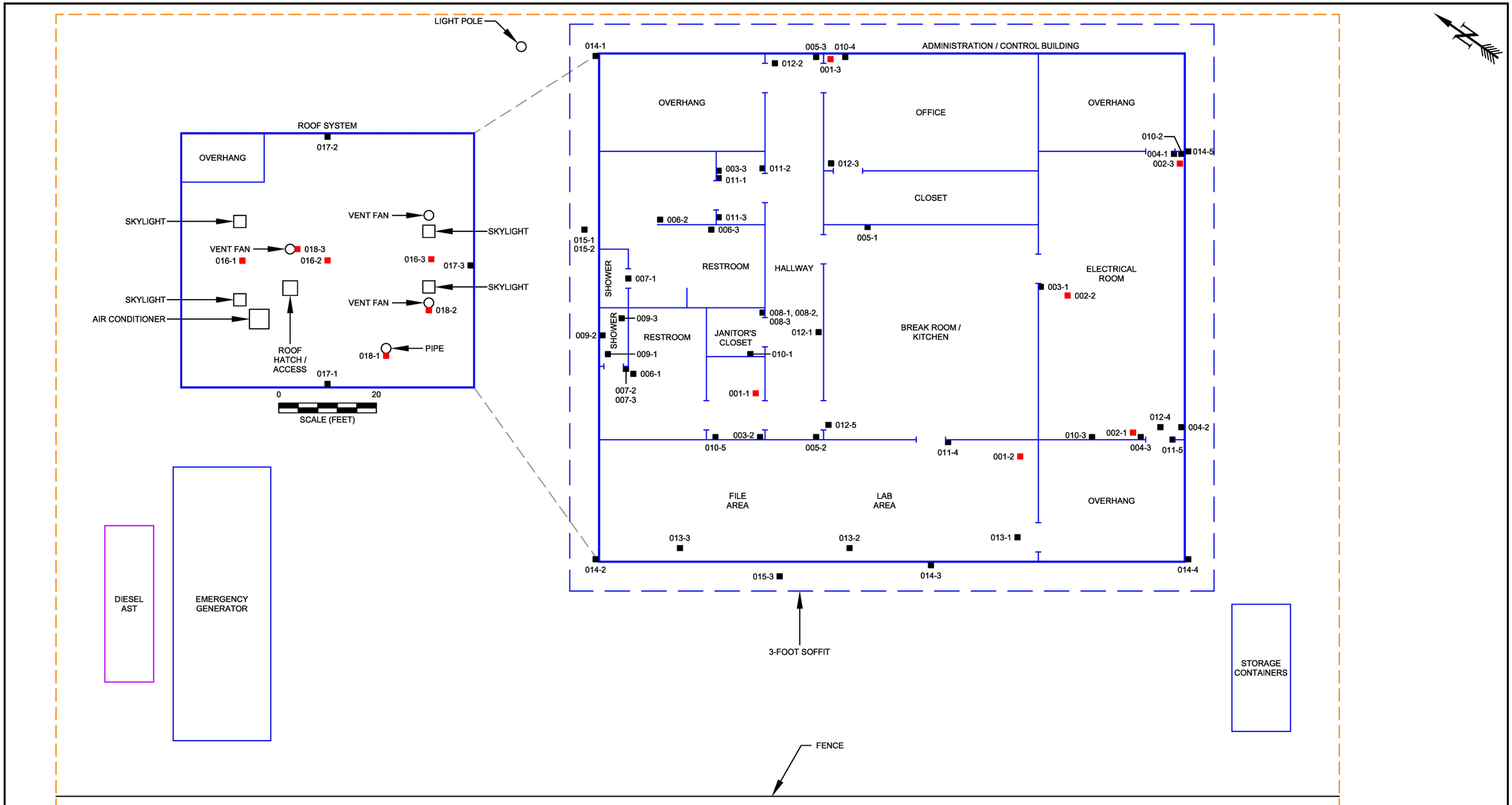
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP

FIGURE 2



LEGEND

AST	ABOVEGROUND STORAGE TANK
001-1 ■	SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
001-1 ■	SAMPLE TESTED POSITIVE FOR ASBESTOS (WITH SAMPLE DESIGNATION)

0 10 20
SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

CITY OF OCEANSIDE
LA SALINA WASTEWATER TREATMENT PLANT
1330 SOUTH TAIT STREET
OCEANSIDE, CALIFORNIA 92054

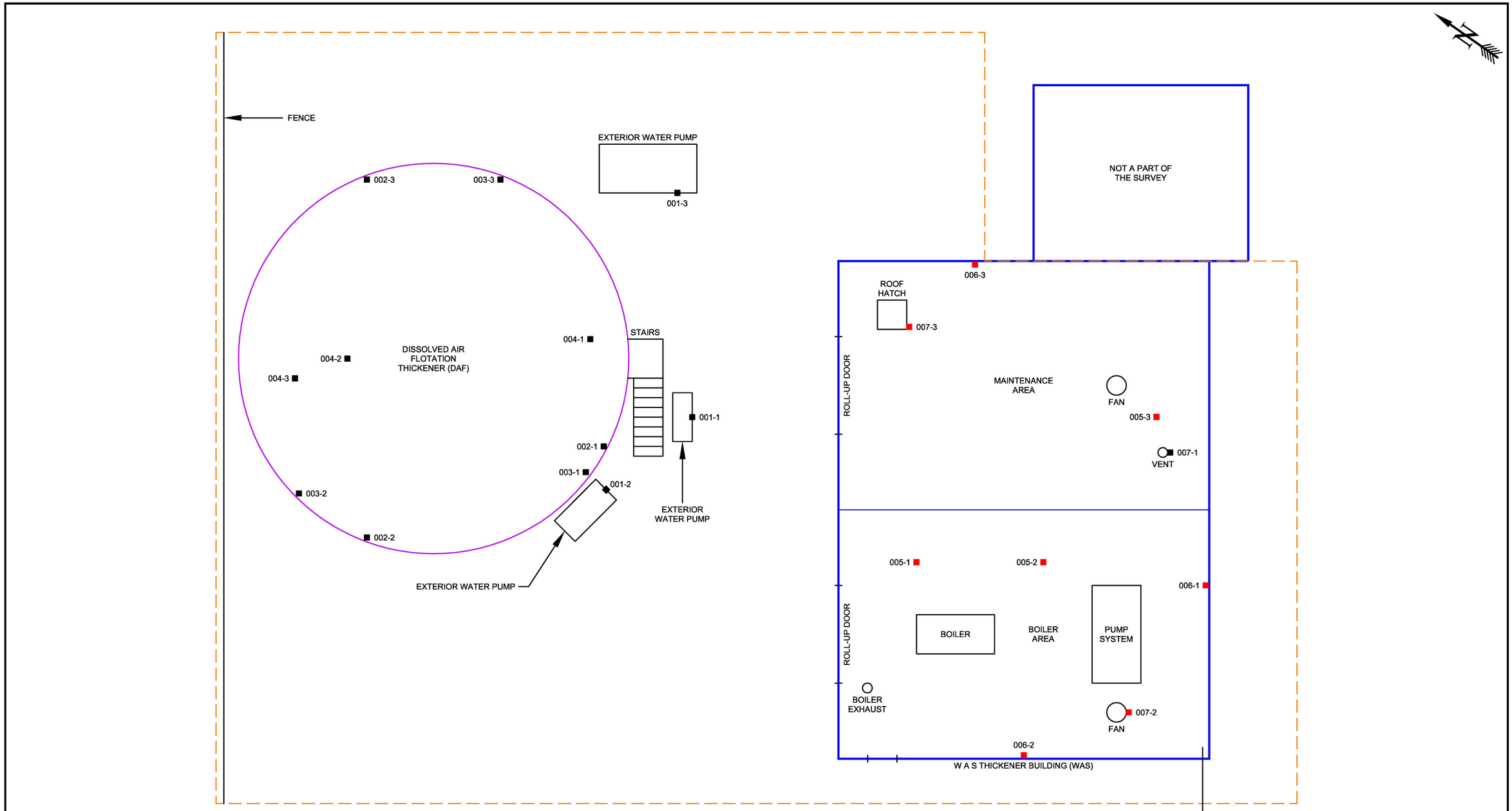
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - ADMINISTRATION BUILDING

FIGURE 2-A



LEGEND

001-1 ■ SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

005-1 ■ SAMPLE TESTED POSITIVE FOR ASBESTOS (WITH SAMPLE DESIGNATION)

0 10 20

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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OCEANSIDE, CALIFORNIA 92054

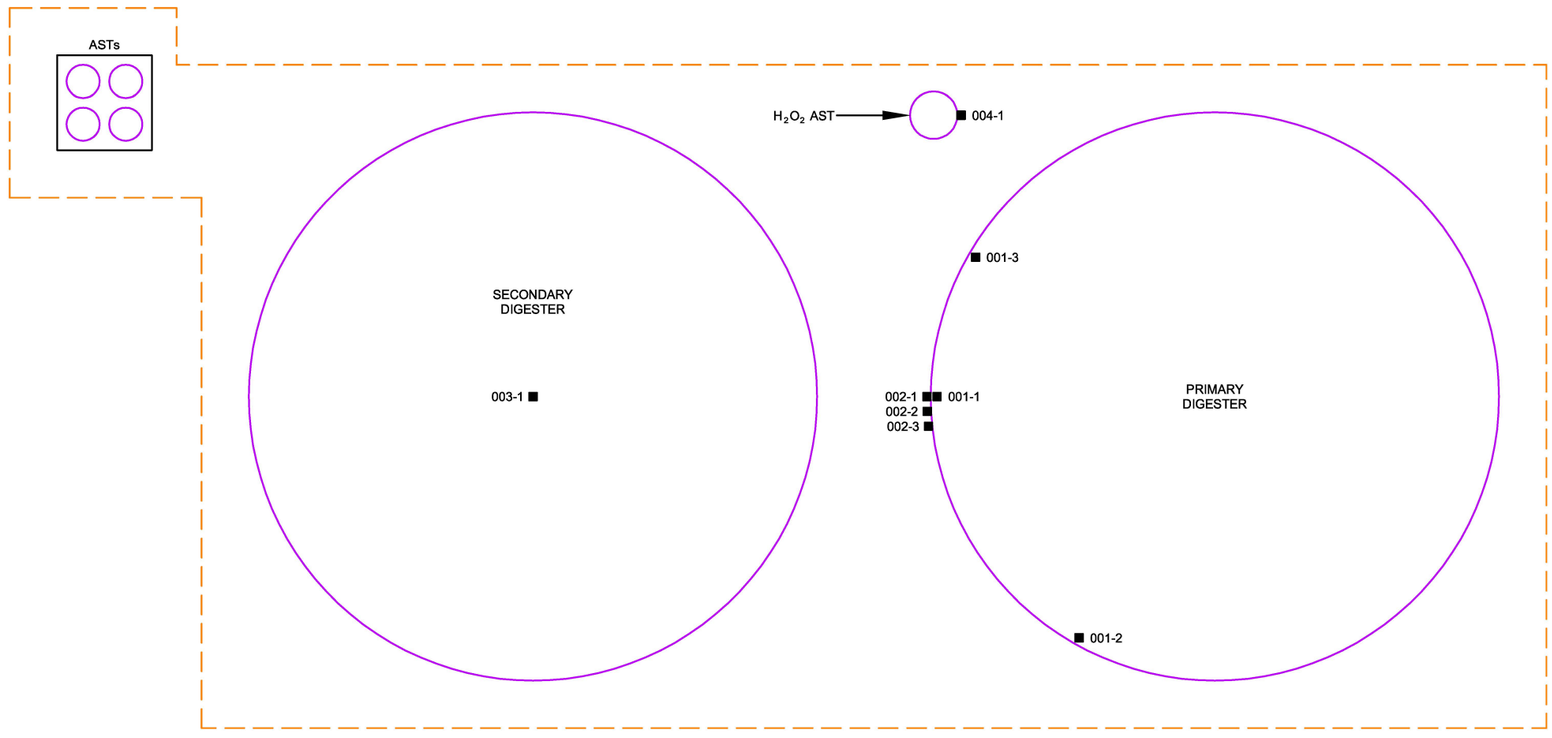
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - DAF SYSTEM AND WAS BUILDING

FIGURE 2-B



LEGEND

AST	ABOVEGROUND STORAGE TANK
H_2O_2	HYDROGEN PEROXIDE
001-1 ■	SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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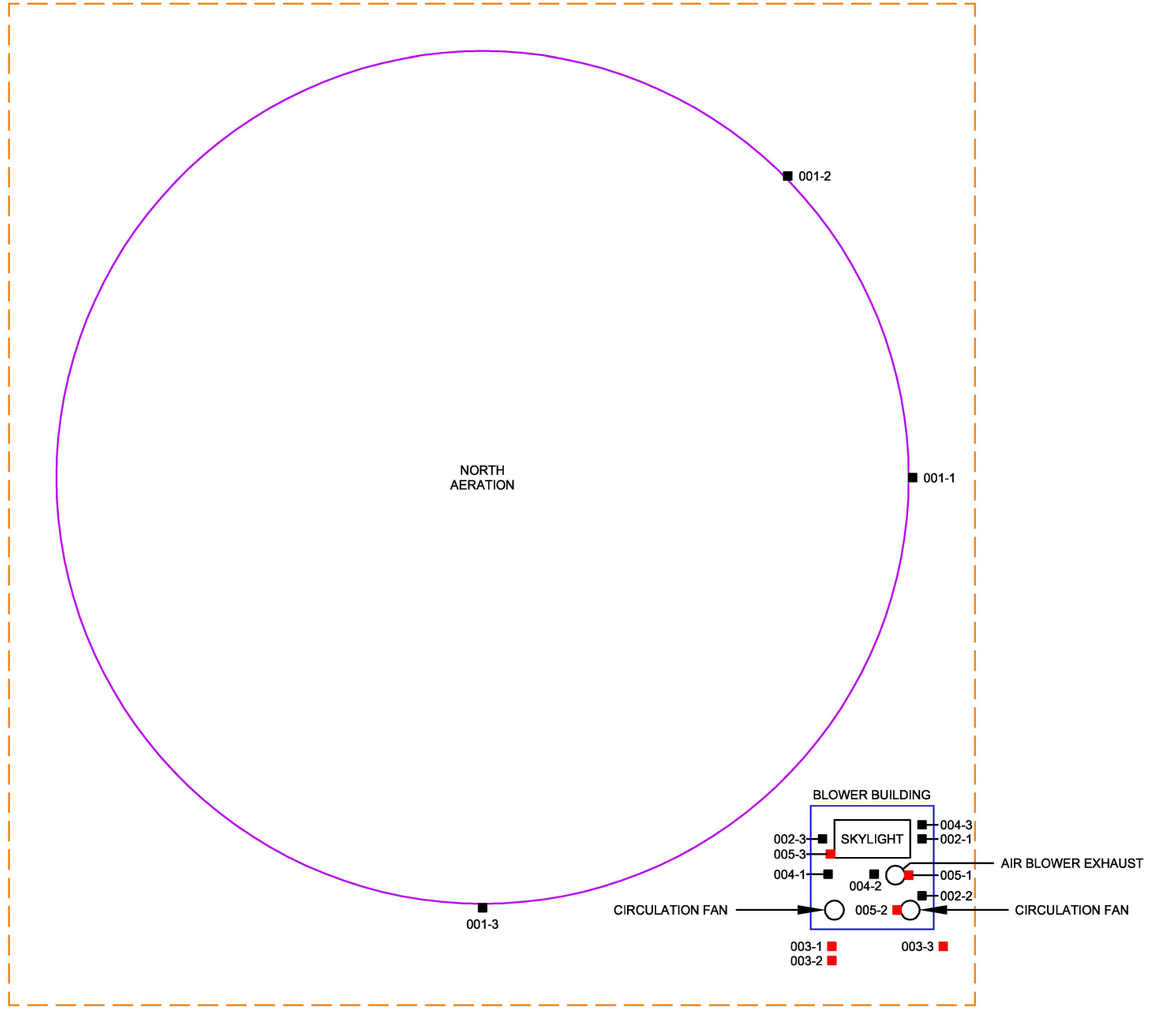
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - PRIMARY AND SECONDARY DIGESTERS

FIGURE 2-C



LEGEND

001-1 ■ SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

003-1 ■ SAMPLE TESTED POSITIVE FOR ASBESTOS (WITH SAMPLE DESIGNATION)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

0 16 32

SCALE (FEET)

CITY OF OCEANSIDE
LA SALINA WASTEWATER TREATMENT PLANT
1330 SOUTH TAIT STREET
OCEANSIDE, CALIFORNIA 92054

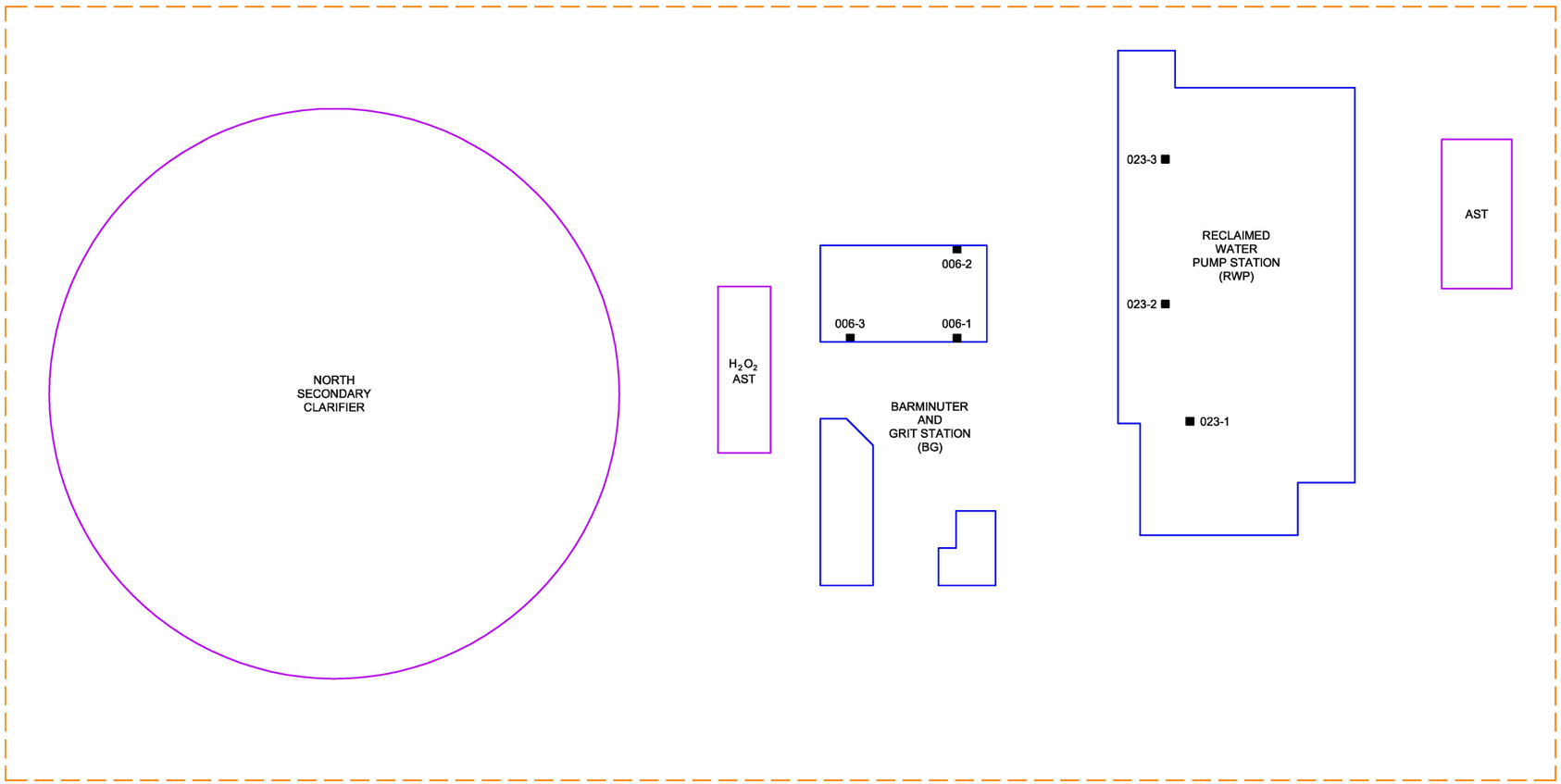
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - NORTH AERATION AREA

FIGURE 2-D



LEGEND

AST	ABOVEGROUND STORAGE TANK
H_2O_2	HYDROGEN PEROXIDE
006-1 ■	SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

0 16 32
SCALE (FEET)

CITY OF OCEANSIDE
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OCEANSIDE, CALIFORNIA 92054

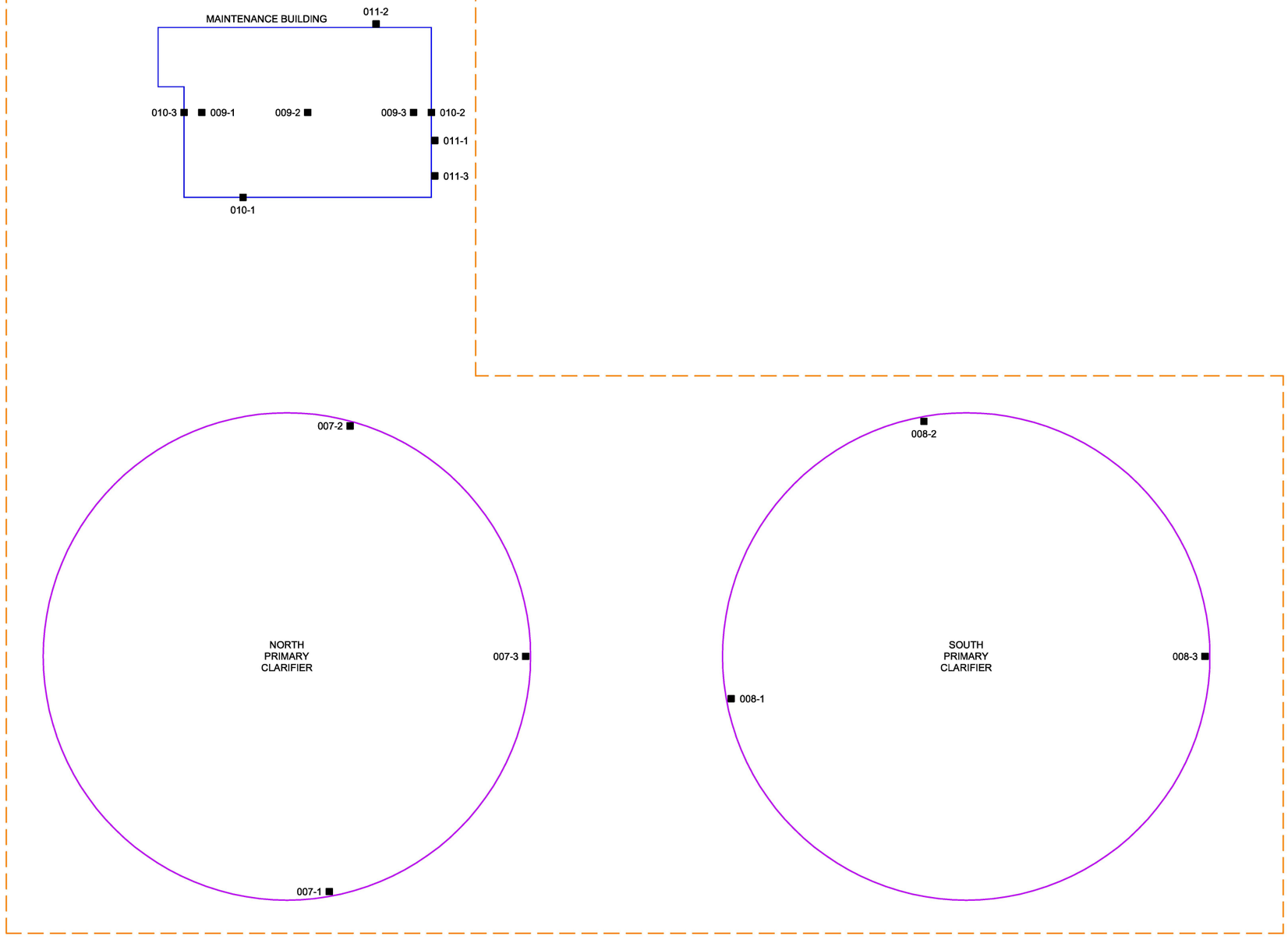
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - NORTH SECONDARY CLARIFIER, BG, AND RWP AREAS

FIGURE 2-E



LEGEND

007-1 ■ SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

0 16 32

SCALE (FEET)

CITY OF OCEANSIDE
LA SALINA WASTEWATER TREATMENT PLANT
1330 SOUTH TAIT STREET
OCEANSIDE, CALIFORNIA 92054

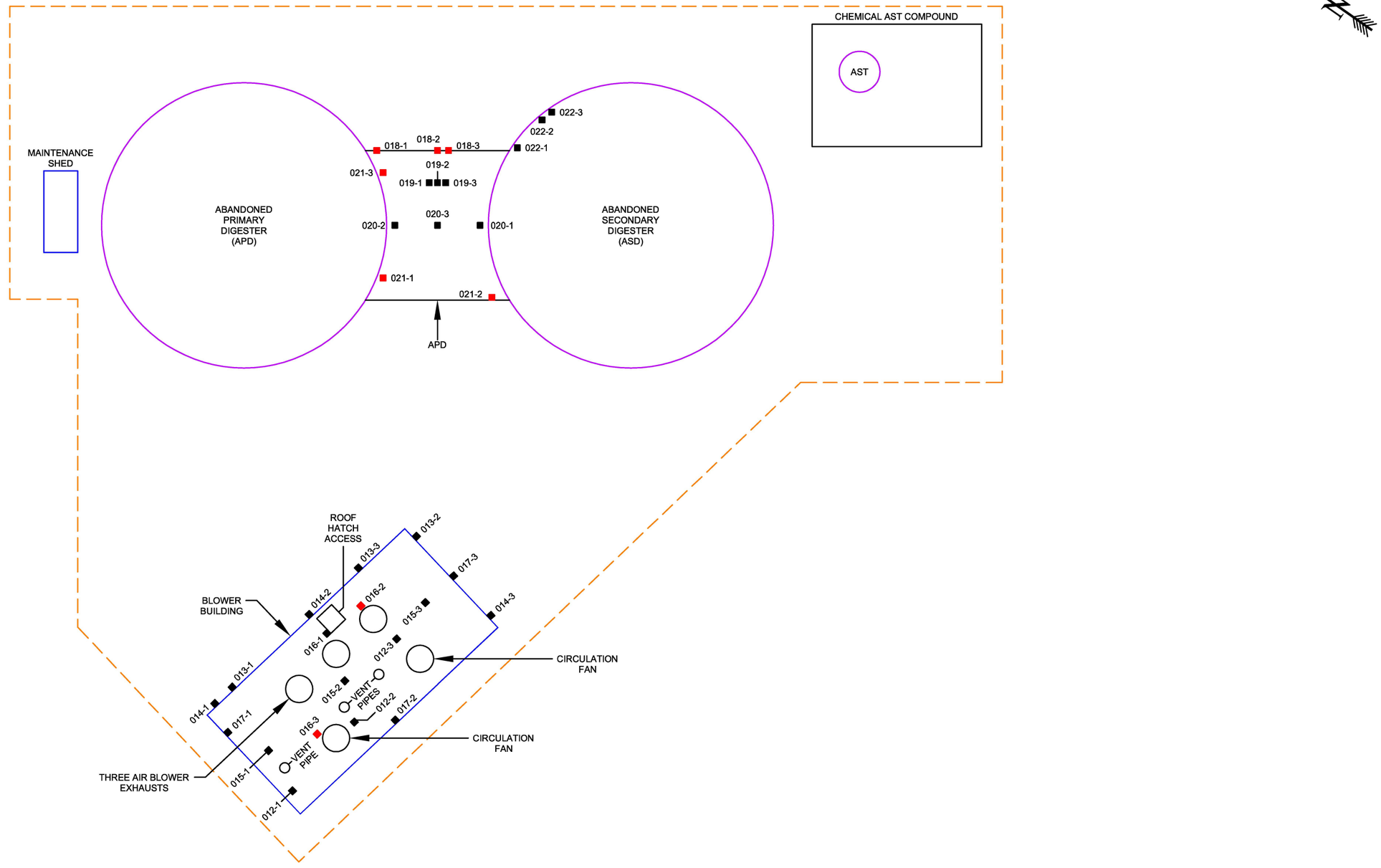
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - MAINTENANCE BUILDING AND NORTH AND SOUTH PRIMARY CLARIFIERS AREAS

FIGURE 2-F



LEGEND

AST	ABOVEGROUND STORAGE TANK
012-1 ■	SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
016-2 ■	SAMPLE TESTED POSITIVE FOR ASBESTOS (WITH SAMPLE DESIGNATION)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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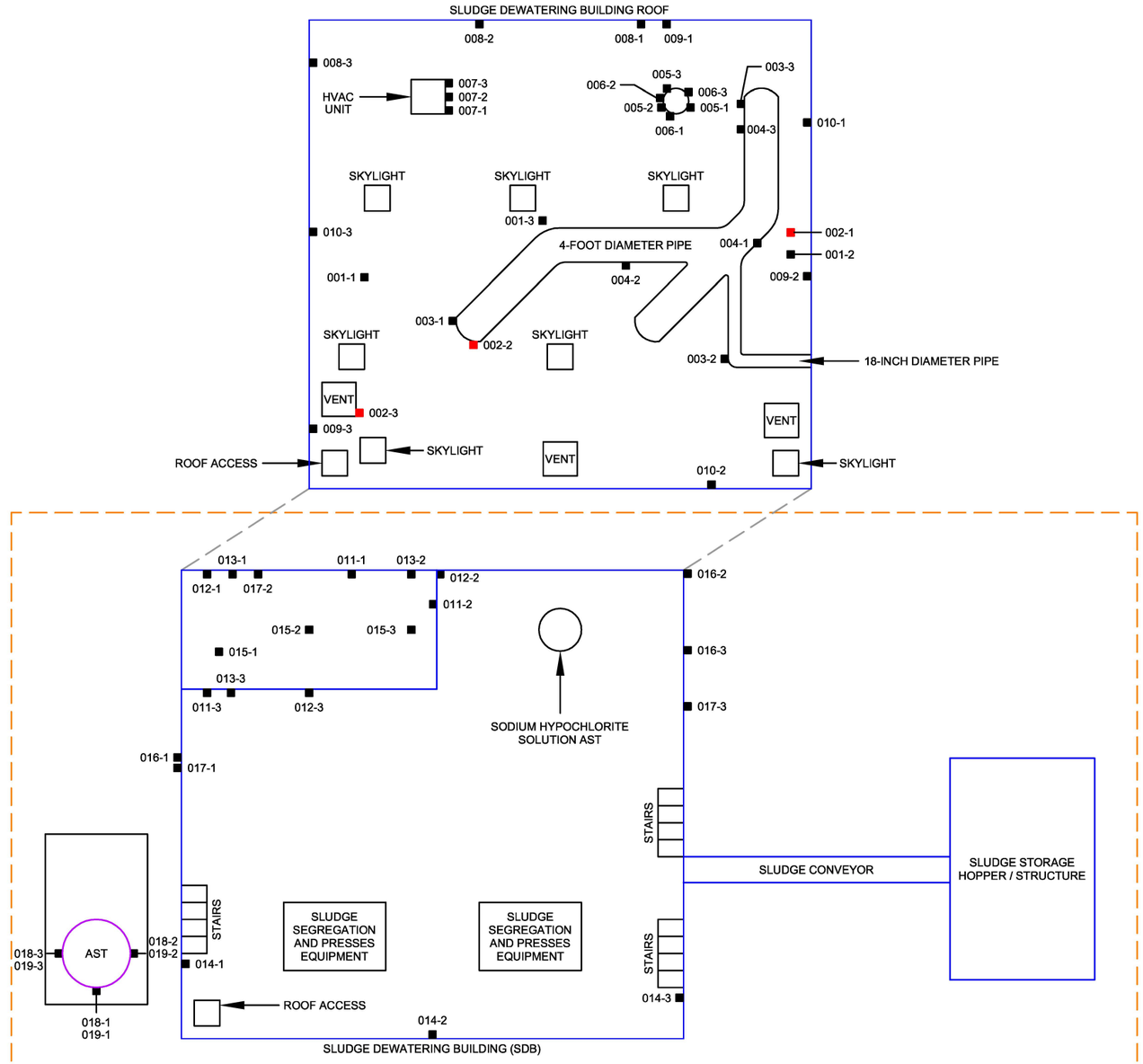
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - BLOWER BUILDING AND APD AND ASD AREAS

FIGURE 2-G



LEGEND

AST	ABOVEGROUND STORAGE TANK
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
001-1 ■	SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
002-1 ■	SAMPLE TESTED POSITIVE FOR ASBESTOS (WITH SAMPLE DESIGNATION)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
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OCEANSIDE, CALIFORNIA 92054

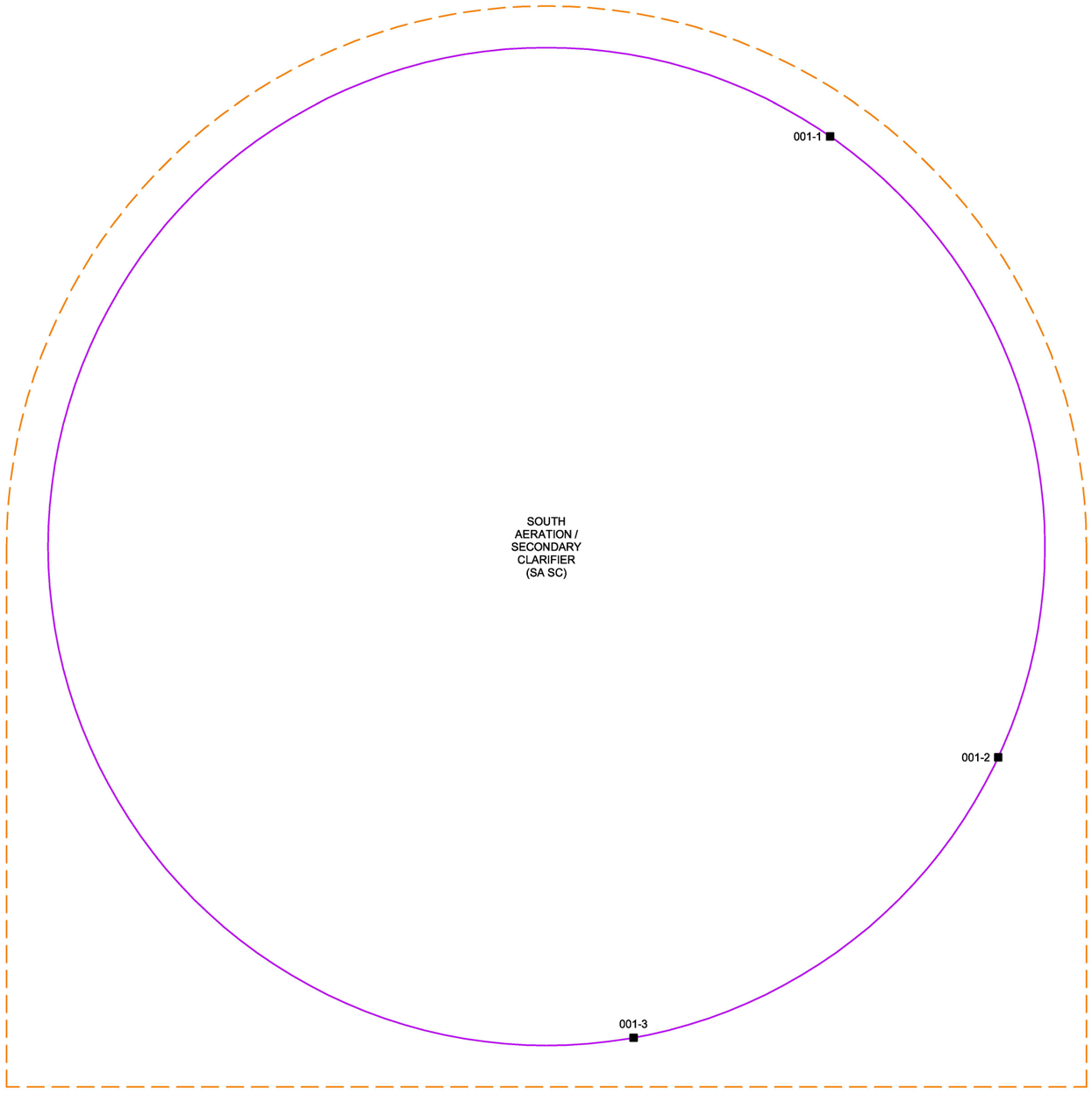
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - SDB BUILDING

FIGURE 2-H



LEGEND

001-1 ■ SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

0 16 32

SCALE (FEET)

NOTES

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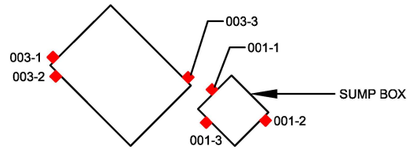
TETRA TECH

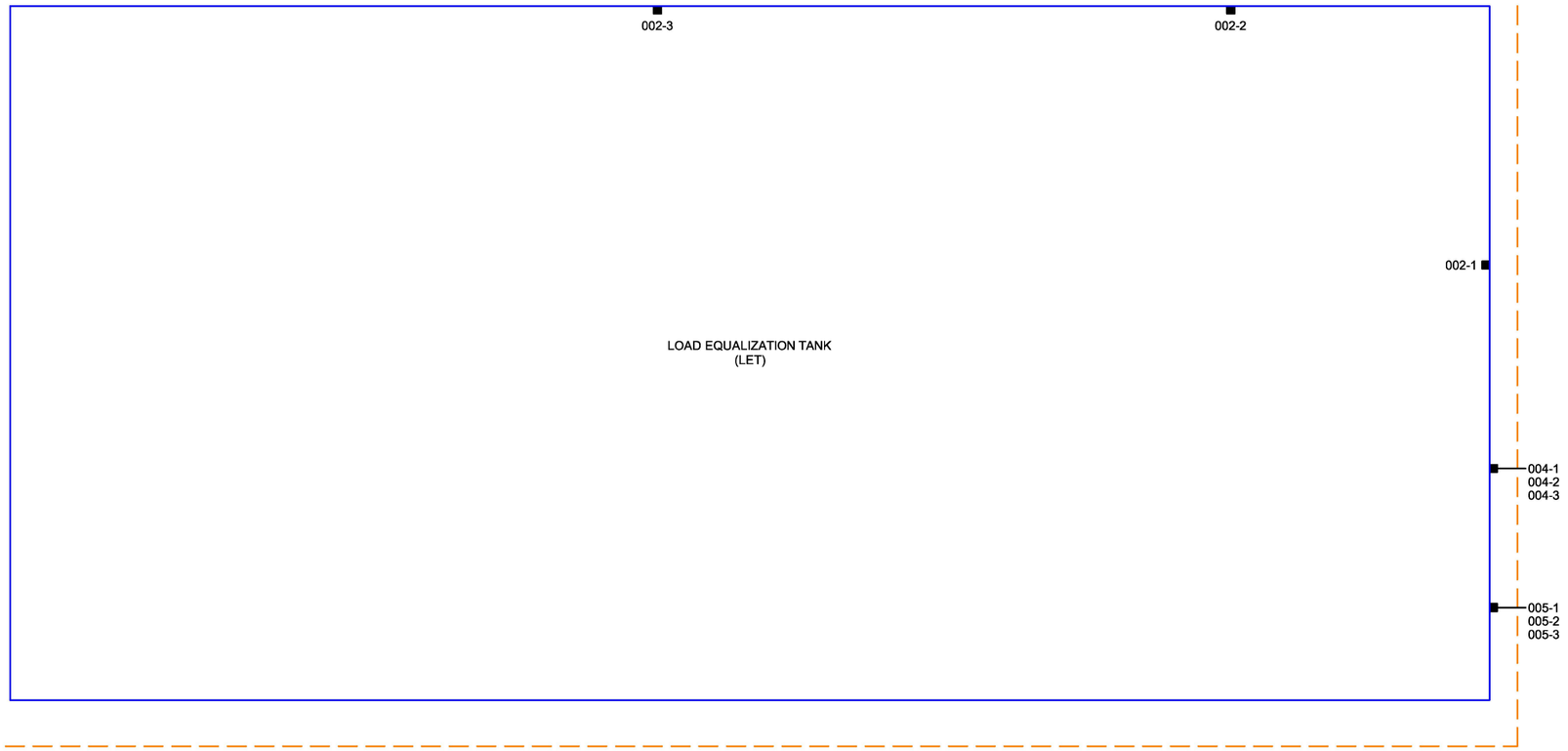
DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - SASC AREA

FIGURE 2-I





LEGEND

001-1 ■ SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

001-1 ■ SAMPLE TESTED POSITIVE FOR ASBESTOS (WITH SAMPLE DESIGNATION)

0 16 32
SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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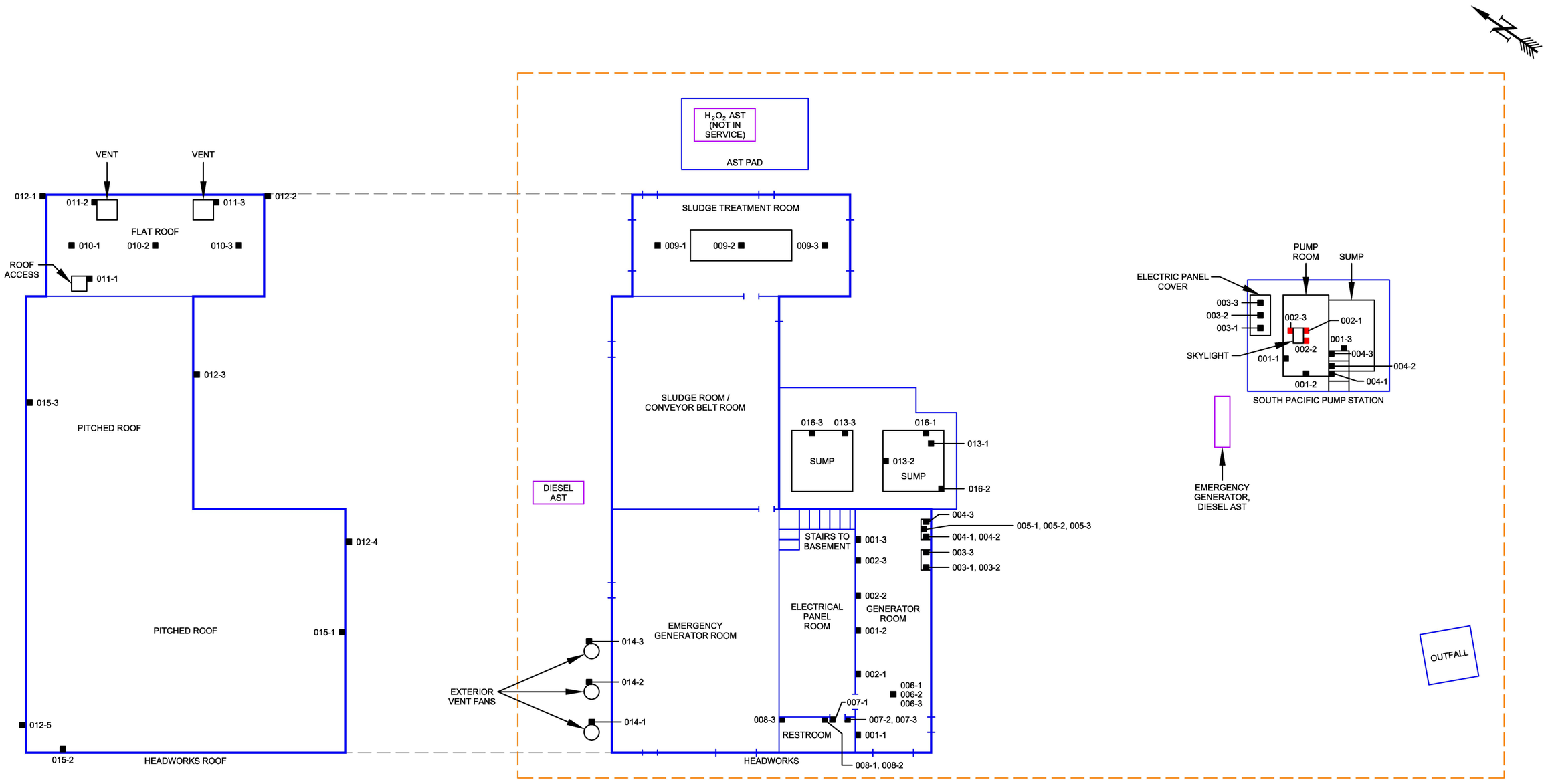
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - LET AREA

FIGURE 2-J



LEGEND

AST	ABOVEGROUND STORAGE TANK
001-1 ■	SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)
002-1 ■	SAMPLE TESTED POSITIVE FOR ASBESTOS (WITH SAMPLE DESIGNATION)

0 20 40

SCALE (FEET)

NOTES

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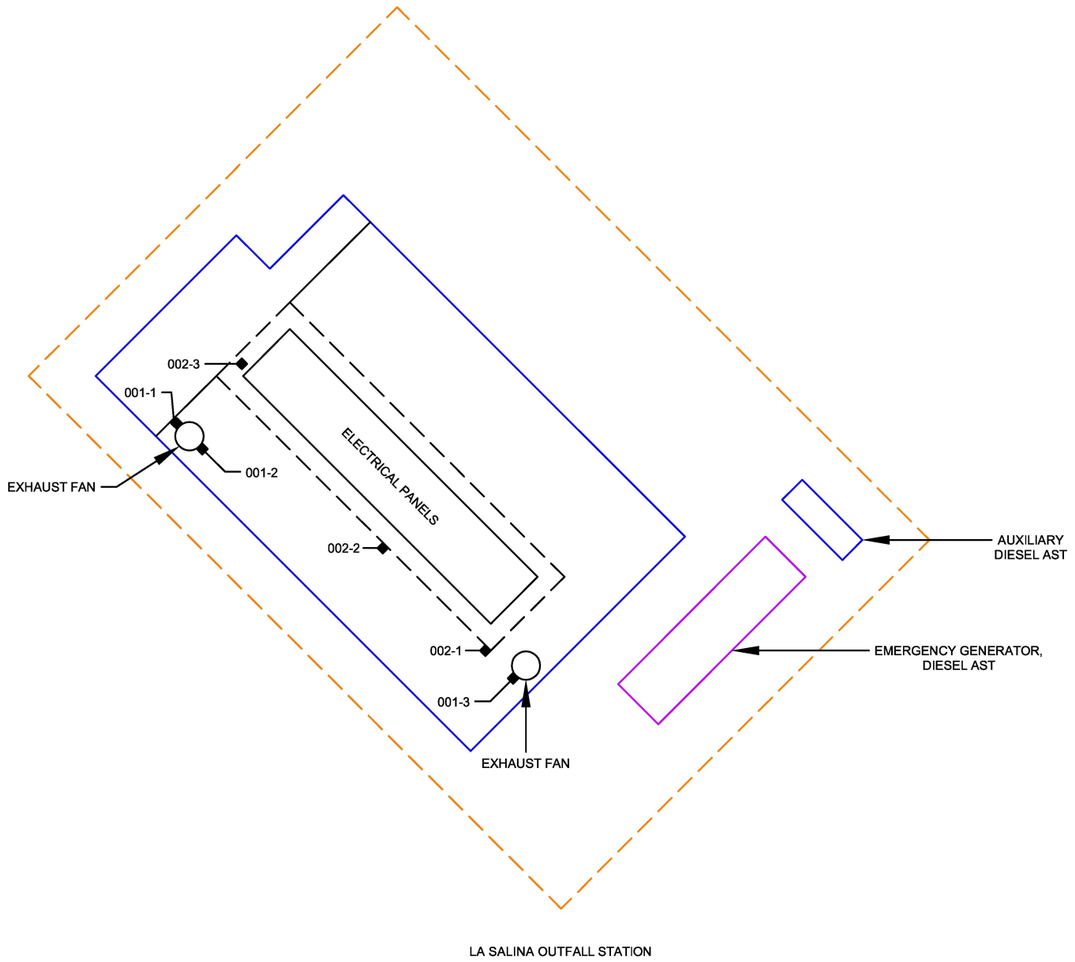
TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - HEADWORKS BUILDING AND SOUTH PACIFIC PUMP STATION AREA

FIGURE 2-K



LEGEND

AST	ABOVEGROUND STORAGE TANK
001-1 ■	SUSPECT ASBESTOS-CONTAINING MATERIAL (ACM) SAMPLE LOCATION AND DESIGNATION (SAMPLES COLLECTED NOVEMBER 16 TO 23, 2015)

0 16 32

SCALE (FEET)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP DERIVED FROM SITE PLANS BY MACDONALD - STEPHENS, ENGINEERS, INC. (1987) AND CAROLLO (2010), AND OBSERVATIONS BY TETRA TECH DURING SITE INSPECTIONS FROM NOVEMBER 16 TO 23, 2015.

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TETRA TECH

DECEMBER 30, 2015

TETRA TECH PROJ. NO. T35149

SITE MAP SHOWING SUSPECT ACM SAMPLE LOCATIONS - LA SALINA OUTFALL STATION

FIGURE 2-L

APPENDIX A

SURVEY TEAM CERTIFICATIONS

DRAFT REPORT - 30 DECEMBER 2015

APPENDIX B

LABORATORY REPORTS, CHAIN-OF-CUSTODY FORMS FOR ACM SAMPLES, AND LABORATORIES' NVLAP CERTIFICATES

DRAFT REPORT - 20 DECEMBER 2015

La Salina Lift Station and Treatment Plant Decommissioning

Appendix L. Pre-Demolition Hazardous Materials Survey Report

Draft

Pre-Demolition Hazardous Materials Survey Report for the La Salina Wastewater Treatment Plant

194-8729
January 2016

PRESENTED TO

City of Oceanside
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Vice President

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Appendix A Regulatory Requirements for Hazardous Wastes
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ACRONYMS/ABBREVIATIONS

AST	aboveground storage tank
CAR	Certified Appliance Recycler
CCR	California Code of Regulations
CFR	Code of Federal Regulations
City	City of Oceanside
DAF	dissolved air flotation
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
H_2O_2	hydrogen peroxide
LED	light emitting diode
LSWWTP	La Salina Wastewater Treatment Plant
MBDF	Mission Basin Desalting Facility
MRSH	Materials that Require Special Handling
PCBs	polychlorinated biphenols
Plant	La Salina Wastewater Treatment Plant
RCRA	Resource Conservation and Recovery Act of 1976
Report	Hazardous Materials Survey Report for the La Salina Wastewater Treatment Plant
SDG&E	San Diego Gas and Electric
SLRWRF	San Luis Rey Water Reclamation Facility
Survey	Hazardous Material Survey

1.0 INTRODUCTION

1.1 LA SALINA WASTEWATER TREATMENT PLANT

The La Salina Wastewater Treatment Plant (LSWWTP or Plant) was originally constructed in the city of Oceanside (City) in 1948. Over the years, the 9.1 acre LSWWTP has been expanded and rehabilitated to its current design and capacity of 5.5 million gallons per day. LSWWTP serves as the connection point for multiple regional discharge pipelines including treated effluent from Fallbrook, Camp Pendleton, and the City's San Luis Rey Water Reclamation Facility (SLRWRF); as well as brine from the Mission Basin Desalting Facility (MBDF) and an industrial discharger. These flows are combined at or near the LSWWTP site before being combined with the treated wastewater from the LSWWTP and discharged to the ocean from the City's Ocean Outfall Pipeline.

1.2 SITE BACKGROUND

In November 2014, the City Council approved a plan to decommission the aging La Salina Wastewater Treatment Plant rather than making the significant repairs required to continue operation of the LSWWTP. This planned project consists of replacing LSWWTP with a new raw wastewater pump station that will convey wastewater from the LSWWTP collection area to San Luis Rey Water Reclamation Facility (SLRWRF) followed by demolishing the LSWWTP. The additional flows to the SLRWRF will also benefit future reclaimed water treatment expansion and indirect or direct potable reuse near the Mission Basin Desalting Facility. The LSWWTP will remain operational until the new pump station is designed, constructed and operational.

1.3 OBJECTIVE OF THE HAZARDOUS MATERIALS SURVEY

The overall objective of the Hazardous Materials Survey (Survey) was to provide a basic understanding of the type, location and amount of different hazardous materials that may be found within the LSWWTP. Separate surveys have been conducted to provide details on the presence of asbestos containing materials and lead-based paint, so those materials are not included in this Survey.

The Survey consisted of a visual examination of the LSWWTP by Tetra Tech staff in November 2015 to document the then-current conditions at the Plant and identify the presence, nature and type of potential wastes throughout the Plant. This Hazardous Materials Survey Report for the La Salina Wastewater Treatment Plant (Report) is intended to document the results of the Survey.

Specifically, the Hazardous Materials Survey focused on:

- Identifying the presence of potentially hazardous materials including mercury, polychlorinated biphenols (PCBs), corrosive compounds (acidic and basic), toxic or radioactive substances,
- Locating equipment and devices that may be classified as Universal Wastes by the U.S. Environmental Protection Agency (EPA) or the California Department of Toxic Substances Control (DTSC).
- Identifying areas within LSWWTP where these materials may be found,
- Assisting the City with the identification of items that might be salvaged for reuse at other City facilities, such as the SLRWRF.

Following the construction and startup of the new raw water pump station, the existing LSWWTP will be decommissioned and demolished. A detailed Scope of Work will be prepared that includes plans and specifications for demolition contractors to use in preparation of their proposal and bid packages for that portion of the planned project.

The results from the Survey will be used to identify the types, locations and approximate quantities of the hazardous materials/wastes that the demolition contractor may encounter. This information will allow the bidding contractors to incorporate the time and costs for addressing the hazardous materials/wastes into their proposals as existing conditions.

1.4 HAZARDOUS MATERIALS IDENTIFICATION

The Survey should be considered a “snapshot” or point in time for the LSWWTP. The exact quantities, locations and conditions of materials observed obviously change continuously when the Plant is operating. Prior to shutting down the LSWWTP, it is anticipated that the City and LSWWTP staff will actively manage the chemicals and materials used, allowing some to be consumed or the quantities allowed to decrease to minimal levels, and other items may be physically removed or transferred to other City facilities.

However, for the purposes of the Survey, the LSWWTP was considered to be “closed” when the Plant was visited for this Survey. The materials that were observed were considered to be no longer in use for their intended purpose, making them “wastes” that the contractor would need to address as part of the decommissioning.

Devices that contain radioactive materials, (such as level monitoring devices for solids, or medical equipment) were not included in the Survey, based on the initial discussions with the City and Operations staff at LSWWTP, which indicated none of these devices are used at the Plant.

For the Survey, the hazardous materials/wastes were broken into different classes for simplified identification. The basic classifications used were hazardous wastes and universal wastes. Examples of the hazardous wastes include oils and greases, solvents, paints, insecticides, soaps and disinfectants, roofing material, sealants, or other items remaining once the Plant is no longer operational. Universal wastes include computer monitors, televisions, fluorescent light bulbs or other similar materials.

The following sections provide additional details on hazardous waste and universal waste definitions and requirements.

1.4.1 Hazardous Wastes

When the products are no longer being used for their intended purpose, are spilled or contaminated with other materials, they become “solid wastes” as defined under the Resource Conservation and Recovery Act (RCRA) as defined under Title 40 of the Code of Federal Regulations (CFR) section 261 (identified as 40 CFR 261). A RCRA “solid waste” may include wastes that are solid, semisolid, liquid or contains gas. Materials that may be recycled or reused in another process or to make a different product, or reused as a substitute for another product are not classified as solid wastes. The state of California has hazardous waste regulations that parallel RCRA, but in some cases are more stringent. These regulations are defined under Title 22 of the California Code of Regulations (CCR) section 66261 (identified as 22 CCR 66261).

The majority of hazardous wastes fall under one of the definitions of “Characteristic Wastes” (40 CFR 261.10 – 261.24 and 22 CCR 66261.20 – 66261.24). These hazardous characteristics are:

- Ignitability (liquid, solid, or gas, including oxidizers, that are capable of ignition or combustion) 40 CFR 261.21 or 22 CCR 66261.21
- Corrosivity (material with pH less than 2.0 or over 12.5, or that corrodes steel) 40 CFR 261.22 or 22 CCR 66261.22
- Reactivity (any material that is unstable or undergoes violent changes without detonating, reacts violently with water or forms potentially explosive mixtures with water, can generate toxic fumes when exposed to

pH between 2 and 12.5, listed as an explosive, or is capable of causing detonation or explosion under specific conditions) 40 CFR 260.23 or 22 CCR 66261.23

- Toxicity (material that contains one or more chemicals at concentrations that are identified as toxic) 40 CFR 261.24 or 22 CCR 66261.24

Wastes may also be classified as hazardous if they are from non-specific sources listed in 40 CFR 261.31 or are on a list of specific sources in 40 CFR 261.32. These hazardous wastes were not considered likely to be present at LSWWTP and were not included in the Survey.

California regulates more wastes as hazardous wastes than those regulated under the federal RCRA rules. These wastes are identified as “non-RCRA hazardous wastes” or “California hazardous wastes.” Used oil is a common California hazardous waste. Appliances that are no longer useful must be disposed in accordance with California regulations. In 2006, DTSC established a certification program for individuals and businesses that process major appliances for scrap. Before they crush or bale an appliance, these individuals and businesses are required remove certain potentially harmful materials. Effective January 1, 2006, only a Certified Appliance Recycler (CAR) may remove these materials, known as Materials that Require Special Handling (MRSH) (California Health and Safety Code 25211.2). Additional details on the disposal of used major appliances are included in Appendix A.

1.4.2 Universal Wastes

The cathode ray tube (CRT) video display components of computers and televisions contain lead and other metals that are sufficient to require managing them as hazardous wastes once they are no longer operational. However, the EPA adopted regulations that conditionally excluded CRTs from the hazardous waste requirements, if they are recycled instead of being sent for landfill disposal (40 CFR 260.4(a)(22)).

California has developed a Universal Waste Rule to allow individuals and businesses to transport, handle and recycle certain common hazardous wastes, identified as Universal Wastes in a manner different than the requirements of most other hazardous wastes. The California hazardous waste regulations identify seven specific categories of hazardous wastes that may be managed as Universal Wastes (22 CCR 66261.9 and California Health and Safety Code section 25201.16).

The Universal Waste categories are:

- Electronic devices (Includes any electronic device that is a hazardous waste, with or without a CRT, including televisions, computer monitors, cell phones, VCRs, computer CPUs and portable DVD players.)
- Batteries (includes most household-type batteries, including rechargeable nickel-cadmium batteries, silver button batteries, mercury batteries, alkaline batteries and other batteries that exhibit a characteristic of a hazardous waste)
- Electric lamps (Fluorescent tubes and bulbs, high intensity discharge lamps, sodium vapor lamps and electric lamps that contain added mercury, as well as any other lamp that exhibits a characteristic of a hazardous waste, such as containing lead)
- Mercury-containing equipment (Thermostats, mercury switches, mercury thermometers, manometers, pressure or vacuum gauges, dilators and weighted tubing, mercury rubber flooring, mercury gas flow regulators, dental amalgams, counterweights, dampers and mercury added novelties such as jewelry, ornaments and footwear)
- CRTs (The glass picture tubes removed from devices such as televisions and computer monitors)
- CRT glass (A CRT that has been accidently broken or processed for recycling)
- Non-empty aerosol cans

According to DTSC, the treatment of aerosol cans as Universal Wastes provides a mechanism for the Generator of the waste (i.e., the City) to legally transport the aerosol cans to a licensed facility for disposal of the waste, but the cans technically remain a hazardous waste and revert to that status when they are received at the disposal facility. This avoids the need for Generator to prepare Hazardous Waste Manifests and pay for a licensed hazardous waste transporter to carry the aerosol cans to the disposal facility.

The waste non-empty aerosol can is a hazardous waste if the waste non-empty aerosol can contains pressurized contents that may be hazardous, if the propellant is ignitable or toxic, or if the product itself is ignitable, corrosive, or toxic. Aerosol cans containing paint, pesticides, and cleaning products are examples of materials that may be hazardous when discarded. Most aerosol cans use hydrocarbons, such as propane, butane, or LPG gas as the propellant. Hence, most waste aerosol cans that are not empty are ignitable hazardous wastes.

Empty aerosol cans may be disposed of as municipal trash or recycled for the metal content. The aerosol cans that are not empty (either still have some contents and/or are still pressurized) and are Universal Waste while the Plant is operational will require treatment as a hazardous waste by the demolition contractor if they are present at the Plant once it is shut down.

1.5 LIMITATIONS AND ASSUMPTIONS FOR THE HAZARDOUS MATERIALS SURVEY

The limitations of the Hazardous Materials Survey include the following:

- This Report has been prepared by Tetra Tech for the exclusive use of the City of Oceanside, as it pertains to the La Salina Wastewater Treatment Plant. Tetra Tech professional services have been performed using the degree of care and skill ordinarily exercised under similar circumstances by other engineers and scientists practicing in this field. No other warranty, express or implied, is made as to the professional advice in this report. Any use of or reliance on this report by a third party shall be at such party's sole risk.
- Tetra Tech offers no assurances and assumes no responsibility for site conditions or activities that were outside the surveillance activities described in this Report. In the preparation of this Report, Tetra Tech has relied on the accuracy of documents, oral information, and materials provided by the City and others. Any subsequent modification, revision, or verification of this report, with the City's authorization, will be provided by Tetra Tech in writing only.
- The Hazardous Materials Survey was a visual survey only. No investigation into the specific contents of products or materials identified was conducted, past observation of hazard warning placards on some containers.
- Unless specifically identified by name, label or a posted safety warning sign as being corrosive, containing mercury, or PCBs, the majority of the wastes were classified under the "potentially hazardous/ toxic" category.
- Separate surveys and reports will address asbestos-containing materials and lead-based paints within the Plant.
- The Survey and resulting materials identified should be considered as a snapshot of the Plant, assuming the Plant was "closed" at the time of the Survey.
- The Survey did not include environmental contamination evaluation at the Plant, nor was any sampling of soils, groundwater, or surface water conducted.
- The designation as a potential type of waste (e.g., hazardous or universal) is based on Tetra Tech's judgement of how the item most likely would be classified and treated by a demolition contractor if the Plant were closed.

- The Survey was not intended to identify each and every individual container, chemical or product and corresponding quantities. Identification is limited to locations and gross types and quantities of materials (e.g., 45 spray cans or two 5-gallon buckets).
- The dump area being used by the City (located in Area G1) is for non-hazardous material only. Additional verification and sampling, including soil sample collection, may be required for this area.
- Specific or individual paints, lubricants, oils, solvents or other chemicals observed were not identified or listed individually during the Survey. Only general descriptions of the types of materials observed were recorded, as the ultimate disposal of such items will be addressed during the decommissioning.

Assumptions used in developing and conducting the Survey include the following:

- It is anticipated that the City will actively manage the chemicals and materials used at LSWWTP prior to shutting operations down. Some chemicals and materials will be consumed or the quantities allowed to decrease to minimal levels, and other items may be physically removed or transferred to other City facilities. This Report is intended to serve as a starting point for planning these reductions.
- Wastewater and sludge generated from Plant operations are not included in this Survey, as these items are expected to be managed directly by the City during the Plant shutdown activities.
- All chemicals found and cataloged during the Survey are chemicals of regular use and quantity found at the Plant. No new storage locations will be established at the Plant before the decommissioning occurs.
- In general, unless identified as a potential salvageable item, the paints, lubricants, oils, solvents or other chemicals observed are considered to be wastes that will require disposal following the Plant shutdown.
- The designation as “Potentially Hazardous/Toxic Waste” shown in the Tables in this Report identifies those hazardous materials that do not fall into the corrosivity, PCB-containing or mercury-containing waste classifications.
- When they are no longer being used (i.e., become a waste), soaps, detergents and other cleaning products are considered to be toxic under RCRA (i.e., hazardous waste), due to the aquatic toxicity test requirements.
- Items identified as potentially salvageable may be reused or transferred to other City facilities, or may be disposed of during decommissioning, depending on the City’s plans (e.g., computers, monitors, fire extinguisher, boxes of cleaners, unused chemicals in original packages, etc.).
- All wastes will require classification by the City (as the generator) and segregation by the demolition contractor for disposal. Materials categorized as Universal Waste may require separate disposal classifications than other RCRA wastes, depending on whether disposal occurs before or after Plant shutdown.
- Aerosol cans identified are classified as a potential Universal Waste as well as a potential Hazardous Waste, since the definition changes when the Plant ceases operations. Non-empty aerosol cans remaining after the Plant is shut down will have to be treated as hazardous waste by the demolition contractor.
- Major appliances will need to be sent to a CAR to remove any MRSH prior to recycling/reclamation of the appliances.
- Fluorescent light and fixture details are based on visual observation of quantities and the Plant Electrician’s feedback on which old fixtures have been replaced with new fixtures. Contractor will be required to verify fluorescent light fixture ballast model for identification of potential PCB-containing ballasts and dispose accordingly.
- Exterior lighting is identified as sodium vapor lamps for most of the Plant, but could not be individually verified. Exterior, High Intensity LED light fixtures identified are considered potentially salvageable and not included in the number of sodium vapor lamps.

2.0 HAZARDOUS MATERIALS SURVEY

2.1 PRELIMINARY PLANT SCREENING

A preliminary Plant visit and screening was conducted by Tetra Tech staff on November 10, 2015. This Plant visit allowed the Tetra Tech team to physically walk through the entire Plant and to meet with the LSWWTP staff to discuss the planned Survey work and schedule. The Plant visit also provided an opportunity to identify an order for conducting the Survey and establish the plans for the Survey. The Plant visit was coordinated with the LSWWTP staff to verify the timing was acceptable for the Plant, as well as to expedite access to normally locked cabinets or rooms. Discussions with the Plant staff during the visit provided additional information and details about different areas of the Plant and when certain components, such as fluorescent light fixtures were installed.

A grid pattern was developed to break the Plant into smaller areas for the Survey, based on the preliminary screening. The north-south grid designations start with “A” in the northeast corner of the Plant and extend to “G” in the south. The east-west grid designations run from “1” on the east side and extend to “3” on the western side of the Plant as shown in the Site Plan (Figure 1). The Survey areas within the Plant are identified by an alpha-numeric combination (e.g., Area A1, B2, etc.).

2.2 SURVEY FOR HAZARDOUS MATERIALS

The Survey was conducted from November 16 to 20, 2015. The Survey consisted of a visual observation of the buildings, rooms, and storage areas located on the Plant. Discussions were conducted with Plant staff to help identify operations in different areas as well as to distinguish equipment that is not owned by the City. The Survey of the Plant was performed in a sequential manner based on the grid pattern shown in Figure 1.The following sections document details observed in each grid area during the Survey.

2.2.1 Area A1

Area A1 consisted of the dissolved air flotation (DAF) thickener aboveground tank and flocculant tank, a Plant parking area and the former WAS thickener area. The eastern half of the former WAS thickener building now is used as a Maintenance Building and the western half as a Heat Exchange Building. Also located in this area are several aboveground blowers, a 1,100 gallon aboveground storage tank for sodium hypochlorite, a chemical storage cabinet holding oil containers, an air compressor, and outside Plant lighting. There are two natural gas area heaters (with a thermostat that may contain a mercury switch), a small portable generator, various battery chargers, computers and monitors and a refrigerator inside the Maintenance Building (Photographs 1 to 3 in Appendix B). The Maintenance Building contained various chemicals, aerosol cans, solvents, lubricants, and electrical equipment that were used by the Plant operators in day to day activities. These items were located throughout the entirety of the building, with the exception of flammable items being located within a yellow flammable materials storage cabinet (Photographs 4 and 5). Specific or individual items located inside of the fire cabinet were not identified or listed during the Survey. Only general descriptions of the types of materials were recorded, as the ultimate disposal of such items will be addressed during the decommissioning.

There is a small area within the Heat Exchange Building that is used to store materials for disposal, such as used fluorescent light bulbs and other materials (Photograph 6) and an area outside of the building for additional disposal materials (Photograph 7).

Between the Heat Exchange Building and the Secondary Digester, there is a storage area for safety equipment, a shed containing an air compressor and a 5-gallon bucket of oil, and a cogeneration system. The cogeneration system (Photograph 8) is owned by others and the Plant staff notify the owners regarding operational and maintenance issues.

2.2.2 Area A2

Area A2 consisted the Administration and Control Building, back up diesel generator with an aboveground storage tank (AST) for diesel fuel (Photographs 9 and 10), electrical control cabinets for the Plant, and outside Plant lighting. The Administration and Control Building contained various chemicals, aerosol cans, solvents, lubricants (Photograph 11), and electrical equipment that were used by the Plant operators in day to day activities. These items were primarily found in the storage closest, janitorial closet, and the laboratory located in the back of the building. . Several refrigerators are located in the building. One is used for food for Plant operators and the other for laboratory samples.

The fluorescent light fixtures in the laboratory room were identified as not being replaced with the newer fixtures. The laboratory room contained an eye wash station, compressed propane gas cylinders, various radio and electronic and computer components and storage areas for various chemicals used in the laboratory. An outside closet holds a water heater for the Administration and Control Building.

Dry (i.e., non-oil containing) electrical transformers and switchgear were located in the Control Building electrical room. A heating and ventilation system is located on the roof of the building, with thermostatic control in the office/control room.

West of the Administration/Control Building are electrical motor control centers and a transformer (Photograph 12). A number of storage containers are located west of the building and used to store bicycles used in the Plant.

2.2.3 Area B1

Area B1 consisted of the primary and secondary digesters, two aboveground hydrogen peroxide (H_2O_2) tanks, a 200 gallon Praestol K 133 L Flocculant tote, and outside Plant lighting. Communication equipment, including a microwave tower, is located adjacent to the Secondary Digester.

2.2.4 Area B2

Area B2 consisted of the north aeration tank, part of the north secondary clarifier, an air blower building for the aeration pond, associated above and below ground piping, and outside Plant lighting. A thermal switch was observed inside the blower building and might contain mercury. An electrical transformer, owned by San Diego Gas and Electric (SDG&E), is located northwest of the aeration tank and along the western perimeter fence along Tait Street.

2.2.5 Area C1

Area C1 consisted of a maintenance building and/or machine shop, the majority of the north and south primary clarifiers, hazardous materials storage in secondary containment, and outside Plant lighting. The maintenance building and/or machine shop contained cabinets with various solvents, lubricants, and cleaners, along with various tools and battery packs for battery driven tools. Various welding equipment a portable air compressor and compressed gas tanks are located in the building. A parts cleaner is located along the southern wall of the building. An air compressor is located in a small shed outside of the north wall of the building.

Just south of the maintenance building along the Plant access road is a short wall constructed from a row of tar-coated utility poles (Photograph 12), adjacent to a number of storage containers with secondary containment used for hazardous materials (Photograph 13). Materials in this area ranged from industrial cleaners, solvents, and deodorants to compressed gases (propane and oxygen), sodium thiosulfate, calcium and sodium hypochlorite, and muriatic acid. This area also contains 200 gallon Praestol K 133 L Flocculant totes, and outside Plant lighting.

2.2.6 Area C2

Area C2 consists of the underground reclaimed water pump station, barminuter and grit chamber, the western edges of the north and south primary clarifiers, and the south of the north secondary clarifier. The barminuter and grit chamber is no longer in use and has been emptied out of any wastewater. There is also an empty metal AST that was used to store H_2O_2 that is currently marked as “empty tank, not in use” located just north of the barminuter and grit chamber. Located above the barminuter and grit chamber is a 3,000 gallon poly tank, which is used to store 50-percent H_2O_2 (Photograph 14). There are also two 275 gallon poly tanks (totes) in the area that are used to hold ferric chloride solution, one of these tanks is empty while the other was approximately half full of ferric chloride.

An air compressor is located next the aboveground control panels for the pump station, and 200 gallon Praestol K 133 L Flocculant totes are located along the western edge of the primary clarifiers. The area also contains outside Plant lighting.

2.2.7 Area D1

Area D1 consists of the waste gas burner (with two small propane tanks supplying the burner pilot fuel) small maintenance shed, used oil storage, the abandoned primary and secondary digesters, part of the hypochlorite and chemical storage area, and the blower building for the south aeration/secondary clarifier. The waste gas burner is located north of the abandoned primary digester and two 10-gallon propane tanks are located adjacent to the burner for the pilot gas. To the west of the waste gas burner is a secondary containment pallet which holds used oil from the Plant. Located alongside the abandoned primary digester is a small maintenance shed which is used to house spare parts and fittings for equipment around the Plant. The hypochlorite and chemical storage area is staged just south of the abandoned secondary digester. This area contains an aboveground poly tank containing hypochlorite and 55 gallon poly drums that contain chemicals used at the Plant (flocculants, polymer, Zetag 8816, etc.) (Photograph 15). The blower building for the south aeration/secondary clarifier contained interior and exterior lighting, this area also contains outside Plant lighting.

2.2.8 Area D2

Are D2 consists of the western edge of the blower building for the south aeration/secondary clarifier and the majority of the south aeration/secondary clarifier itself. No chemical storage or use was observed in this area. The area does contain building lighting due to the western edge of the blower building and outside Plant lighting.

2.2.9 Area D3

Are D3 consists of another access point into the Plant, the Fallbrook effluent line sample location, and the northern portion of the load equalization tank. The load equalization tank is a large tank used to help equalize flow for the Plant and is housed in a concrete structure. No chemical storage or use was observed in this area, the area does contain outside Plant lighting.

2.2.10 Area E1

Area E1 consists of the sludge dewatering building, a sludge conveyor and storage structure, part of the chemical storage area, and a portion of the south aeration/secondary clarifier. The chemical storage area for this portion is used to store 200 gallon Praestol K 133 L Flocculant totes, approximately 8 were on site in this area at the time of the Survey. The sludge dewatering building is used to reduce the amount of water in the sludge during the treatment process. Located within the building are several shelfs containing spare parts, equipment, chemicals, and solvents used during this process. The electrical control room contains computers and control panels for the process. There is a flammable storage locker that could not be accessed due to obstructions. Interior and exterior building lighting is present. The sludge dewatering building control room has emergency lighting units installed.

Sodium hypochlorite is used in this building. It is pumped from a poly drum, with a metering pump, into a large interior scrubber that is part of the dewatering process for the sludge. The sludge conveyor takes the dewatered sludge from the interior of the building outside to the south of the dewatering building where it is stored in a storage structure. From here the sludge is loaded into trucks and taken off site for processing. This area also contains outside Plant lighting.

2.2.11 Area E2

Area E2 consists of the southern part of the aeration/secondary clarifier. No chemical storage or use was observed in this area. This area contains outside Plant lighting.

2.2.12 Area E3

Area E3 consists of the majority of the load equalization tank, the northern part of the headworks, and a 1,000 gallon diesel AST and electrical generator for the headworks. As mentioned previously in section 2.2.9 Area D3, no chemical storage was observed for the load equalization tank. The diesel AST is located south of the load equalization tank and north of the headworks building, and is used as a fuel source for the backup generator for the headworks (Photograph 16). This area contains outside Plant lighting. The headworks building will be discussed in Section 2.2.15 Area F3.

2.2.13 Area F1

Area F1 consists of a steel intermodal storage container (“Seatainer”) used for storage located south of the sludge storage structure, a rack used to store old Plant hoses and piping, a maintenance storage area consisting of three Seatainers, and three additional Seatainers that are being used by the Oceanside Ironman competition group to store equipment for the event. The Seatainer used for storage near the sludge structure contains parts and supplies for the Plant, and has indoor fluorescent lighting. The three Seatainers being used as part of the maintenance storage contained numerous chemicals, paints, solvents, aerosols, and fuels (Photograph 17). All three Seatainers also contained indoor fluorescent lighting. This area also contains outside Plant lighting.

2.2.14 Area F2

Area F2 consists of landscaping and access roads on the Plant. No chemical storage or use was observed in this area, outside Plant lighting is located in this area.

2.2.15 Area F3

Area F3 consists of the headworks building, a metal AST, a sodium hypochlorite poly tank, two emergency generators and diesel ASTs, and the South Pacific pump station. A large metal AST is located directly east of the head works building. This tank is currently marked as “Empty Tank, Not in Use” and shows signs of outdoor wear. Hand cleaner stations are located in various places around the building.

The headworks building contains several levels, electric control panels for the equipment, a room for supplies and a bath room, multiple blowers and pumps, and a conveyor belt to help separate solids. Fluorescent lights are located within the building and outside building lighting is located along the exterior of the building. Cleaners, solvents, spare exterior light bulbs containing mercury (Photograph 18), oil and oil drips, and two air compressors are located within the building interior. Various cleaners are located in the bathroom in the headworks building.

An HVAC unit which supplies climate control to the headworks building is located along the north side of the building exterior on the ground floor. There is an emergency generator and for the headworks and the 1,000 gallon AST supplying the generator is detailed in Area E3.

A 2,400 gallon sodium hypochlorite poly tank is located south of the headworks building. Located south of the Headworks building, directly north of the South Pacific pump station building is an emergency generator with a 200 gallon AST with diesel fuel for the South Pacific pump station (Photograph 19). The south pacific pump station itself contains fluorescent lights. Outside Plant lighting is located in this area.

2.2.16 Area G1

Area G1 consists of a dump station for use by the City, with two 40-cubic yard roll-off bins. No chemical storage or use was observed in this area, but due to the nature of the Plant, City work, and use of the area as a dump station, additional sampling may be required for this area. Outside Plant lighting is located in this area.

2.2.17 Area G2

Area G2 consists of the Loma Alta Creek UV Treatment System building and the La Salina Outfall Pump Station. The UV treatment building has been identified as being left in place during the LSWWTP demolition. The La Salina Outfall Pump Station consisted of electrical control panels to control the pumps and blowers, fluorescent lighting, and an emergency generator and two Diesel fuel ASTs (300 and 500 gallon capacities) (Photograph 20). Outside Plant lighting is located in this area.

2.2.18 Area G3

Area G3 consists of an empty lot area and paved Plant road, no chemical storage or use was observed in this area. Outside Plant lighting is located in this area.

3.0 RESULTS OF HAZARDOUS MATERIALS SURVEY

3.1 LOCATIONS OF POTENTIALLY HAZARDOUS MATERIALS/WASTES

The Survey identified that the majority of the hazardous materials/wastes are concentrated in a few areas. Other hazardous materials/wastes, such as the fluorescent lights and Plant exterior lighting, are located throughout the Plant. Areas where concentrations of hazardous materials/wastes were observed are the:

- Administration and Control Building (Area A2), Maintenance buildings (Areas A1, C1 and E1),
- Storage containers adjacent to the south primary clarifier (Area C1) and the
- Steel Seatainers located south of the sludge dewatering building in Area F1.

The complete listing of the Survey details is included in Appendix C. This listing is organized by the Area identification and a second “Vicinity” designation. The Vicinity designation refers to the building or structure the materials were found in or adjacent to or a reference area if the items are not closely associated with a structure.

3.2 DETAILS OF THE SURVEY

Details of the Survey, describing what was found, where it was identified, what waste category each item may potentially fall into, and where each item was located during the Survey were tabulated for reference. The details are broken into four groups, based on the nature of the item and waste classification. The four groups include:

- Potentially Hazardous Wastes (Table 1)
- Potential PCB-Containing Wastes (Table 2)
- Potential Universal Wastes (Table 3)
- Potential Salvageable Items and Materials (Table 4)

Many of the identified items may fall into multiple categories, so they appear on more than one table. For example, a non-empty aerosol can may be considered as either a hazardous waste or a Universal Waste depending on the conditions. This results from the classification of the particular item at the time of decommissioning. The non-empty waste aerosol can will be considered a Universal Waste if the can is addressed prior to the Plant shutdown or it will be a hazardous waste once the Plant is shut down.

The following subsections provide more details about the different items and classifications used in the Survey.

3.2.1 Potentially Hazardous Wastes

The items and materials identified that could be classified as potentially hazardous wastes are shown in Table 1. The hazardous waste classifications includes those items that are corrosive, toxic, ignitable, or contain mercury, PCBs or other specific chemicals. California regulations include used oils, fuels and wastes associated with these materials as hazardous wastes. Table 1 provides a simplified classification for the different materials identified as potential hazardous wastes.

Many items or devices that are still useable may become a hazardous waste based on their contents at the time of actual classification and disposal. For example, a cleaner or hand soap, when no longer being used and being processed for disposal, becomes hazardous due to the toxicity to aquatic species.

Major appliances (defined as: stoves, microwave ovens, washers, dryers, refrigerators, furnaces, water heaters, space heaters, air conditioners, boilers, and trash compactors) must be sent to a Scrap Recycling Facility for

management/removal of MRSH inside the appliances. Following the removal of the MRSH, the appliances may be scrapped. (Appendix A contains details on this process).

Unused chemicals, unless they are reusable at another City facility, will require disposal at appropriate waste disposal facilities based on the nature of the hazardous waste (e.g., liquid, solid, oxidizer/acidic/basic, toxicity, etc.). Fire extinguishers are located throughout the Plant. Depending on the condition and age, these may not be suitable for salvage and reuse at other City facilities. This will require that they be disposed of based on the chemicals used in the dry chemical powder in each extinguisher, and likely will be considered hazardous.

Thermostats, which frequently contain mercury, were identified as potentially “mercury-containing” items in the Survey. The presence or (absence) of mercury will require verification prior to disposal/classification. Mercury-containing devices will have special disposal requirements. Fluorescent light bulbs and fixtures were identified as Universal Wastes or potentially “PCB-containing” depending on whether the fixtures appeared to have been replaced recently or not, or were identified as possible issues by the Plant Electrician.

The classification of hazardous wastes under RCRA is the responsibility of the generator (the City). City personnel will need to provide direction on the waste classifications, in conjunction with the disposal contractor handling the wastes, at the time of decommissioning of the Plant.

3.2.2 Potential PCB-Containing Wastes

PCB-containing materials are a special case of hazardous wastes and as such, must be handled accordingly. Some PCB-containing materials may be present in the appliances identified in Section 3.2.1, but those are handled as part of the appliance scrapping process. Table 2 contains a listing of the Potential PCB-containing waste materials.

No City-owned electrical transformers that contain PCBs were identified visually or in conversations with the Plant Electrician during the Survey. The transformers identified by SDG&E equipment numbering are not included in the Survey as they are the property of SDG&E, and are anticipated to be removed by the utility during decommissioning of the Plant.

Prior to decommissioning, the fluorescent light fixtures will need to be opened to allow the ballast in each fixture to be observed and the manufacturer and model number to be verified and compared with listed models that contain PCBs. At that time, any fixtures with PCB-containing ballasts may be flagged for proper disposal.

3.2.3 Potential Universal Wastes

The Universal Wastes consist of a variety of materials, including electronic wastes, such as computers, monitors, printers, televisions, videorecorders, aerosol cans (paints, solvents, lubricants, etc.), and fluorescent or sodium vapor light bulbs. The fluorescent light bulbs and fixtures are identified as both Universal Wastes and “PCB-containing” if the fixtures did not appear to have been replaced recently, or were identified as possible issues by the Plant Electrician.

Table 3 contains a listing of the Potential Universal Waste materials identified during the Survey.

3.2.4 Potential Salvageable Materials

Many items, devices or materials were identified that may be salvaged for reuse, if desired by the City. If the City decides that it is practical to salvage these items, they would not be considered wastes. Alternately, any of these items identified as salvageable that are not reused, would need to be addressed as the appropriate waste classifications. In this case, the contents may need to be drained for disposal (i.e., fuel or chemicals in tanks or drums) or consolidated into over-pack drums or containers (i.e., aerosol cans, bottles or cans) for shipping to a

licensed waste disposal facility. Table 4 contains a listing of the Potential Salvageable Materials identified during the Survey.

Possible salvageable items include office equipment, such as computers as well as small equipment and tools (2-way radios, drills, power strips, emergency lights, stereos, televisions, batteries and chargers, etc.) and large items such as air compressors, LED floodlights, unused chemicals, and oils and lubricants. Fire extinguishers are located throughout the Plant. Depending on the condition and age, these salvageable items may be considered for salvage and reuse at other City facilities, or possibly donated to charitable organizations.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 SURVEY CONCLUSIONS

During the Survey of the LSWWTP, a large number of items were identified that will require handling prior to or during the decommissioning of the Plant. These items are typical of any operating facility and do not indicate any unusual conditions or issues. As identified in Section 3, some items may have multiple classifications, depending on circumstances and the final disposition of those items.

4.1.1 Potentially Hazardous Wastes

Hazardous or potentially hazardous wastes were identified throughout the Plant during the Hazardous Materials Survey. The items consisted primarily of:

- Water treatment chemicals (flocculants, H_2O_2, hypochlorite, deodorizers)
- Aerosol cans (pressurized) containing paints, solvents, lubricants, cleansers and degreasers, pesticides,
- Containers holding oils, lubricants and greases, and flammable fuels (gasoline, diesel and propane)
- Outdoor and indoor lights and bulbs containing mercury or other hazardous materials
- Waste oils
- Mercury-containing switches or thermostats
- Soap, cleaners, detergents
- Paints and stains, solvents, tar, sealants
- Acids or other corrosive materials
- Fire extinguishers
- Various large appliances (refrigerators, microwaves, washer, dryer, space heaters, etc.)

Descriptions and details on the locations where these items were identified are presented in Table 1.

Possible PCB-containing electrical devices, including fluorescent light ballasts may be hazardous or not, (depending on the verification of the manufacturer and ballast content) and are shown in Table 2.

4.1.2 Potential Universal Wastes

Universal wastes are ubiquitous throughout work environments and LSWWTP is no exception. Universal Wastes were identified throughout the Plant during the Survey. Many of the items identified as hazardous wastes were in aerosol cans which might be classified as Universal Wastes if they were not pressurized. The items identified consisted of: aerosol cans, florescent lights, paint cans, solvents, grease, sealers, cleaners, and computer/electrical equipment. Details on these items and the locations where they were identified are included in Table 3.

4.1.3 Potential Salvageable Materials

Potential salvageable materials were identified during the Survey. The materials and items identified varies but in general consist of items that have the potential for being reused. The reuse may be at another wastewater treatment facility (such as SLRWRF) or at other City facilities altogether.

For some items, the decision about reuse may be based on the age or remaining lifespan of the potentially reusable item (such as an air compressor or appliance) or the ease in moving/relocating the potentially reusable item (such as drums or containers of unopened chemicals). During the Survey, items such as mechanic tools (wrenches, saws, hoists, etc.) and golf-cart style and bicycle transportation were not included.

The potentially salvageable items consisted primarily of:

- Electronic equipment (including computers, printers, monitors, television and video devices, microwave communication system, etc.),
- 2-way radios with charging stations and extra batteries,
- Safety and medical equipment such as the defibrillator and first aid boxes, emergency lights and protective equipment,
- Fire extinguishers,
- Excess unopened chemicals, solvents, sealers, paint, aerosol cans (such as solid chlorination tablets, containers of deodorants and sanitizers, totes, 5-gallon oil buckets, 55-gal drums of various materials, cleaners, etc.),
- Appliances used by the Plant operators (microwave, stove, refrigerators [excluding the lab sample refrigerator]),
- Diesel Generators and associated diesel fuel tanks,
- Welding equipment including torches, equipment, and compressed gas tanks in good repair,
- Portable generators and air compressors, tools,
- Battery operated equipment (drills, saws, etc.),
- Tubes of silicone caulking, and
- Small, portable Propane tanks.

The descriptions and locations of these items are presented in Table 4.

4.2 RECOMMENDATIONS

The Survey identified areas throughout the LSWWTP where various hazardous materials are located. These materials will require classification by waste type for subsequent removal prior to the start of the decommissioning and demolition of the Plant. The quantities of materials identified during this Survey are considered to be normal levels for the Plant, but obviously will vary over time and operating conditions.

The Survey's overall intent is to provide a baseline of the materials within the Plant that will require removal and disposal by the demolition/decommissioning contractor at the start of their field work. The locations and potential quantities identified during the Survey will be included in the plans and specifications for the demolition and decommissioning of the LSWWTP.

In anticipation of the decommissioning and demolition of the LSWWTP, there are a number of actions that the City can begin work on now to simplify and reduce the ultimate costs for the planned project. These actions are briefly described in the following sections. While some actions do not eliminate the hazardous materials, the identification and classification of the materials, and relocation of the reusable or salvageable materials to another City facility or direct removal of the wastes by the City (for Universal Wastes) is likely to be a lower cost alternative than the disposal by the demolition contractor during the decommissioning.

4.2.1 Potentially Hazardous Wastes

The generation of hazardous wastes is a normal part of the Plant operations. However, some of the hazardous wastes, and the associated disposal costs, may be minimized through planning and coordination of the procurement and use of the materials. Other materials that would require offsite disposal might be suitable for reuse at another City facility, such as the SLRWRF. Potential actions that might be used to minimize the remaining hazardous wastes when the Plant shuts down include:

- Reduce the level of supplies maintained at the Plant as the shutdown approaches

- Identify chemicals and other materials that are used at other City facilities and have the responsible City staff for those facilities and the Plant staff coordinate on supplies
- Label the materials that will be sent to other facilities so that they can be transferred following the Plant shutdown, and before the decommissioning begins
- Identify materials and items that will not be reused and verify that the containers are labeled with the contents for the ultimate disposal by the demolition contractor.

4.2.2 Potential Universal Wastes

The regulatory requirements for Universal Wastes provide an incentive to reduce the amount of these wastes at the Plant prior to the shutdown. Closure costs associated with the Plant may be reduced by removal and disposal of the largest percentage of the Universal Wastes in the period before shutdown. Identical wastes that must be handled by the demolition contractor (or a subcontractor to the demolition contractor) following shutdown will be classified as hazardous wastes and the cost and liability for their disposal will be significantly higher.

Many of the items identified as Universal Waste are also potential Salvageable items. Identification of Salvageable items and where they may be reused prior to the Plant closure will minimize the level of effort required following the Plant shut down.

One of the largest categories of Universal Wastes is aerosol cans containing various materials. Since Universal Wastes may be packaged and transported to the disposal facility by City staff and Plant operators, the quantities of aerosol cans remaining following the Plant closure can be reduced by disposal of unneeded aerosol products prior to shut down. This will reduce the demolition project costs proportionally.

4.2.3 Potential Salvageable Materials

A significant number of materials and items were identified that might still be useful or useable following the Plant closure. Those items that are not suitable for salvage and reuse, will require handling as either Universal Wastes, or following the Plant closure, likely as hazardous wastes.

Chemicals are not considered to be a waste if they can still be used for their original purpose by another facility. Items such as propane cylinders, calibration gases, and unopened containers of caulking, oil, paint and chemicals are all potentially salvageable for other facilities.

Many of the electronic devices (computers, monitors, radios, battery chargers, etc.) may be reusable elsewhere. Equipment like air compressors and tools have multiple opportunities for continuing use. Some equipment, such as the diesel generators may be reused or possibly sold if they are in good condition and are not needed elsewhere within the City.

Appliances may be reused if they are within their normal service life. Some of them may be donated to charitable organizations if the City does not have another facility that could use them.

The reduction of the amount of salvageable materials that become wastes (and ultimately hazardous wastes) through reuse will have a large impact on the costs required for segregation, packaging, transportation and disposal of wastes following the closure of the LSWWTP.

5.0 REFERENCES

40 CFR 261 – Identification and Listing of Hazardous Waste

22 CCR 66261 - Identification and Listing of Hazardous Waste

California Health and Safety Code, Division 20, Chapter 6.5, Article 10.1 Management of Hazardous Wastes Removed from Discarded Appliances 25211 - 25214

TABLES

Table 1. Potentially Hazardous Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
A1	Boiler Room	Tubes of Silicon caulking			X			Yes	
A1	DAF	Sodium hypochlorite			X				1,100 gal. poly tank
A1	DAF	Aerosol cans			X (Note 4)		X (Note 4)		Loose spray cans
A1	DAF	buckets of oil - #2@ 5 gal ea.			X				Exterior of DAF by pumps east of bldg
A1	DAF	Praestol R133H Flocculant 2,300 lb poly tank			X			Yes	
A1	DAF/ Flammable Cabinet	5-gal containers of oil (some 22.7 liter) approx. #30			X			Yes	Flammable Cabinet
A1	DAF/ Flammable Cabinet	Quarts of oil, gear oil			X			Yes	Flammable Cabinet
A1	Maintenance Building	Soap & disinfectants			X				Safety locker
A1	Maintenance Building	Honeywell thermostat- For heater, gas heater				X?	X		On wall, by man door; 2 natural gas space heaters
A1	Maintenance Building	Space heaters, natural gas heaters			X (MRSH)	X?			Appliance, from ceiling 2 natural gas space heaters
A1	Maintenance Building	Flammables Cabinet - solvents, cleaners - spray can			X (Note 4)		X (Note 4)		also some PVC solvent/glue
A1	Maintenance Building	Insecticide - ant killer			X				
A1	Maintenance Building	Hand soap, cleaners			X				
A1	Maintenance Building	Electric space heater			X (MRSH)			Yes	portable
A1	Maintenance Building	Oxy-acetylene torch w/ gas cylinders			X (if pressurized)			Yes	
A1	Maintenance Building	Wax, cleaners; car wash cleaner			X				Outside building, By air compressor and sink on east side
A1	Maintenance Building	Grease cartridges, oil and lubricants			X				Interior cabinets

Table 1. Potentially Hazardous Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
A1	Maintenance Building	Paints			X (Note 4)		X (Note 4)		Spray cans, interior cabinet
A1	Maintenance Building	Aerosol cans of Solvents and cleaners			X (Note 4)		X (Note 4)		Spray cans, containers, interior cabinet
A1	Maintenance Building	Refrigerator (mini)			X (MRSH)			Yes	Freon must be removed prior to disposal of refrigerator as waste
A1	Maintenance Building	Roof adhesive and cement, in gallon cans and 5 gal. buckets			X				
A1	Maintenance Building	Honda Generator EU 6500 LS			X (ignitable)			Yes	gasoline fuel, oil must be drained before disposal
A1	Maintenance Building	Epoxy, Loctite, lubricants, degreasers			X				On workbench
A2	Admin Building	Refrigerator - lab samples			X (MRSH)				
A2	Admin Building	Floor wax 5 quart and 5 gal			X				Water Heater room
A2	Admin Building	HVAC unit on roof - R410 refrigerant gas			X (MRSH)				Freon gas removal required for waste disposal
A2	Admin Building	Aerosol cans, paint, air freshener, solvents, degreasers, cleaners			X (Note 4)		X (Note 4)		Back storage room
A2	Admin Building	Cleaners, bleach, soap, (liquid) hand sanitizer			X				Back storage room
A2	Admin Building	Air spray, lubricants, cleaners (aerosols)/liquid cleaners			X (Note 4)		X (Note 4)		Janitorial closet
A2	Admin Building	Fluorescent lights/fixtures (#29) inside		X			X		
A2	Admin Building	Small calibration gas cylinders, oxygen, nitrogen -Compressed gas			X (if pressurized)			Yes	
A2	Admin Building	Washer and dryer			X (MRSH)			Yes	appliances
A2	Admin Building	Eye wash station			X				In Laboratory area
A2	Admin Building	Propane cylinders - #4 x 1 lb			X (if pressurized)				In Laboratory area; non-hazardous if propane used or cylinders empty

Table 1. Potentially Hazardous Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
A2	Admin Building	Chemicals - various for testing water quality, etc.			X				In Laboratory area
A2	Admin Building	Fluorescent lights & fixtures - #7 x 4' fixtures, 2 and 4 light fixtures		X			X		Possible PCB - In Laboratory area not replaced
A2	Admin Building	Pump solvent for airless sprayer - #3, quarts			X				In Laboratory area
A2	Admin Building	Pesticides, cleaners			X				Janitor closet
A2	Admin Building	Microwave			X (MRSH)			Yes	Control/Lunch room
A2	Admin Building	Refrigerator			X (MRSH)			Yes	Control/Lunch room
A2	Admin Building	Thermostat - wall mounted				X?	X		Control/Lunch room
B1	Secondary Digester	Hydrogen peroxide tanks (#2)			X				Peroxide must be removed and tanks washed,1,000 gal metal tank
B1	Secondary Digester	Praestol R133h Flocculant			X			Yes	250 gal poly tote
B2	Blower Bldg	Thermal control for blower				X			may contain mercury
C1	Containers South of Maint Bldg	Used aerosol cans (10-20)			X (Note 4)		X (Note 4)		in Deodorant container
C1	Containers South of Maint Bldg	Accu-TAB calcium hypochlorite tabs, 55 lb bucket	Oxidizer/ Corrosive Acid		X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Compressed Gas Cylinders: oxygen (1 full), helium & Argon (1 full)			X (if pressurized)			Yes	In Compressed Gas Cylinder locker
C1	Containers South of Maint Bldg	Sodium hypochlorite 55-gal poly drum (#1)	Corrosive		X			Yes	in Sodium hypochlorite container
C1	Containers South of Maint Bldg	ACCU-TAB calcium hypochlorite tabs; 55 lb bucket	Oxidizer/ Corrosive		X			Yes	in Sodium hypochlorite container
C1	Containers South of Maint Bldg	sodium hypochlorite poly drums 4 x 55-gal	Oxidizer/ Corrosive		X			Yes	in Sodium hypochlorite container

Table 1. Potentially Hazardous Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
C1	Containers South of Maint Bldg	Muriatic acid (#12) boxes of #4 1-gal bottles + #2 5-gal poly	Acid		X			Yes	in Muriatic acid container
C1	Containers South of Maint Bldg	Eucalyptus concentrate - (#7) gal			X (ignitable)			Yes	Flammable - alcohol
C1	Containers South of Maint Bldg	Elimin-odor/ lemon - (#11) gal			X (ignitable)			Yes	Flammable - Ethanol
C1	Containers South of Maint Bldg	Chem search 777 - corrosion preventer #2 x 2-1/2 gal			X			Yes	
C1	Containers South of Maint Bldg	CIP cleaner - 5 gal. Sodium thiosulfate crystals - #10 x 50 lb			X			Yes	
C1	Containers South of Maint Bldg	Green sweeping compound (#2) (100 lb)			X			Yes	Spill equipment container
C1	Containers South of Maint Bldg	Sodium thiosulfate (#10) (50 lb)			X			Yes	in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Tornado Acid CIP cleaner (5 gal bucket)	Acid		X			Yes	in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Frazes traffic paint (1 can) (1 gal)			X				in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Neutralizer absorbant	Base		X			Yes	in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Eucalyptus odorant concentrate (#2) gallon bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Elim-odor (#11) gallon bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Zep cleaner, cherry odor (#8) gallon bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	State cleaner, apple odor, (#12) morning fresh odor (#1) gallons			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Zep cleaner, DEO-1 Or DEO-3 (#3) gallons, bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Unifresh, cherry odor (#1) gallon, plastic bottles			X			Yes	in Deodorant container
C1	Maintenance Building	Brake cleaner, Loctite adhesive cement			X				

Table 1. Potentially Hazardous Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
C1	Maintenance Building	Patch & bond for metals, concrete, other			X				
C1	Maintenance Building	Parts washer - Armakleen cleaner solution			X			Yes	Parts cleaner and drum of cleaner solution
C1	Maintenance Building	Propane tank - 10 gal			X (if pressurized)			Yes	
C1	Maintenance Building	Cleaners (liquid soap)			X				
C1	Maintenance Building	PVC glue cans			X				
C1	Maintenance Building	Compressed gas cylinders (oxy-acetylene/heliarc welding)			X (if pressurized)			Yes	Deposit on cylinders, 100CF oxygen, helium/argon
C1	Maintenance Building	Solvents (Derma Kleen 4JN Cleaning solution)			X				
C1	North of Abandoned Primary digester	55 gal oil drums partially full #2			X				Waste Storage along Access Road, Inside secondary containment
C1	North of Abandoned Primary digester	Used oil storage - #1 - 55 gal. #4 - 25-30 gal			X				Waste Storage along Access Road, Inside secondary containment
C1	South of Maint Building	Coated pieces of utility poles for landscape/retaining wall			X				Approx. 15 short poles coated with tar/creosote
C1	South of Maint Building	Propane tank ~10 gallon			X (if pressurized)			Yes	Non-hazardous if empty/depressurized
C2	Grit Chamber	Hydrogen peroxide solution 50% w/w 3,000 gal poly tank	Oxidizer/ Corrosive (acid)		X				~1,750 Gal in Tank
C2	Grit Chamber	Ferric chloride 275 gal poly (one full one empty)	Oxidizer/ Corrosive (acid)		X				Poly tote over secondary containment, 2/3 full; Salvage Deposit on tote
C2	South of N. Sec. Clarifier	Hydrogen peroxide tanks "Empty, Not in use" label on tank			X				May need to be cleaned and documented
D1	La Salina WWTP air blower bld.	Oil drips, absorbent pads (used) oil			X				Under blowers to catch leaks

Table 1. Potentially Hazardous Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
D1	Sodium Hypochlorite Storage Area	4,100 gal poly tank sodium hypochlorite			X				Large poly in containment area
D1	Sodium Hypochlorite Storage Area	Lubricant aerosol can			X (Note 4)		X (Note 4)		Lubricant spray can
D1	South of secondary digester	Praestol 186k polymer			X				55 gal poly, Mat #656870
D1	South of secondary digester	ZETAG 8816 (US) (BASF)			X (ignitable)				55 gal poly, Mat #56462479
D1	South of secondary digester	Polydyne (written on drum) C-6288			X				55 gal poly, acrylamide emulsion, slight health hazard Mat Lot # RC19/3069
D1	South of secondary digester	Praestol A 3050 L Flocculant			X				55 gal poly, Mat #656753
D1	Waste gas burner	(2) 10 gal propane tank			X (if pressurized)			Yes	Connected to burner - pilot gas
E1	North of Sludge Bldg	Praestol A 3050 L Flocculant			X				250 gal poly tote, Mat #674985
E1	Sludge Drying Building	empty poly drums (#4)			X (if not washed)				55 gal, unlabeled; May need to be cleaned and documented
E1	Sludge Drying Building	Aerosol cans of Lubricants and oils and cleaners			X (Note 4)		X (Note 4)		
E1	Sludge Drying Building	LA chemchlor, Sodium hypochlorite 12.5% solution	X		X				for scrubber
E1	Sludge Drying Building	Empty deodorant poly			X (if not washed)				May need to be cleaned and documented
E1	Sludge Drying Building	Plastic aerator packing material			X (if not washed)				In sodium hypochlorite solution
E1	Sludge Drying Building	Yellow flammable cabinet			X				Blocked, unknown inside

Table 1. Potentially Hazardous Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
E1	Sludge Drying Building	outside lights (#7)				X			Sodium vapor lights
E1	Sodium Hypochlorite Storage Room	Praestol A 3050 L Flocculant			X				55 gal poly, Mat #657337
E1	Sodium Hypochlorite Storage Room	Praestol A 3050 L Flocculant			X				(4) 250 gal poly totes, Mat #674985
E3	Headworks	outside building lights (#6)				X			Yellow/sodium vapor building lights
E3	Headworks	Diesel fuel pump			X (if not drained, washed)				Upstairs
E3	Headworks	Spray cans and cleaners			X (Note 4)		X (Note 4)		Upstairs
E3	Headworks bathroom	Aerosol cans, Cleaners & air fresheners			X (Note 4)		X (Note 4)		
E3	Headworks bathroom	Cleaners and soap (Cleaners & air fresheners)			X				Hand soap and sanitizer, bleach
E3	Headworks control room	Outside light bulbs spare bulbs (approx. #12)				X		Yes	sodium vapor lights
E3	Headworks control room	Box of 40 watt tubes				X?	X	Yes	Box of 40 watt tubes
E3	Headworks control room	Pint can of PVC glue (#1)			X				
E3	North of headworks	Diesel Fuel in 1,000 gal AST			X				AST - double contained
F1	Inside Storage seatainer	Paint cans (1 gal)			X				Approx. 47 cans
F1	Inside Storage seatainer	Paint bucket (4 gal)			X				Approx. 3
F1	Inside Storage seatainer	Spray cans (aerosol)			X (Note 4)		X (Note 4)		Approx. 20 aerosol cans

Table 1. Potentially Hazardous Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
F1	Inside Storage seatainer	Bug Stop (1.33 gal) (#2)			X				
F1	Inside Storage seatainer	Paint buckets (~4 gal)			X				Approx. 4
F1	Inside Storage seatainer	Plant food, Miracle Gro			X				
F1	Inside Storage seatainer	Wood stain			X				
F1	Inside Storage seatainer	Spray cans, paint thinner & lubricants			X (Note 4)		X (Note 4)		Approx. 45 cans
F1	Inside Storage seatainer	Paint cans (1 gal)			X				Approx. 30 cans
F1	Inside Storage seatainer	1 gal container acid	X		X				Unmarked, only corrosive label
F1	Inside Storage seatainer	1 container 2.2 gal, solvents			X				Mineral spirits solvent
F1	Inside Storage seatainer	5-gal Bucket all weather roof cement			X				
F1	Inside Storage seatainer	Gas cans, approx. #15			X (if not drained, washed)				1-5 gal sizes, if contain gasoline it must be disposed separately
F1	Inside Storage seatainer	Aerosol cans			X (Note 4)		X (Note 4)		Approx. 25
F3	Headworks	outside lights (sodium vapor) (#8)				X			
F3	Headworks	Oil leaks and Absorbent Pads			X				Around equipment
F3	So Pacific Pump Station	200 Gal diesel fuel AST for generator			X (if not drained, washed)			Yes	Diesel fuel must be removed from AST
F3	South of Headworks	Deodorant drum			X				55 gal. poly May need to be cleaned and documented
F3	South of Headworks	2,800 gal sodium hypochlorite poly	Oxidizer/ corrosive		X				May need to be cleaned and documented

Table 1. Potentially Hazardous Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
G2	Outfall Pump Station	Aerosol can Lubricant/solvent			X (Note 4)		X (Note 4)		
G2/3	Outfall Pump Station	Diesel Fuel ASTs 300 gal and 500 gal for generator			X			Yes	Diesel fuel must be removed from AST
Site wide	Site wide	Fire Extinguishers			X			Yes	Dry chemical Fire extinguishers need to be classified based on type of dry chemical used in each extinguisher. May be hazardous
Site wide	Site wide	outdoor lights on posts (approx. #76)				X	X		Single, double, and triple light posts sodium vapor lamps

Notes:

1. Area Designations (i.e., A1 to G2) are shown on Figure 1
2. Classifications are based on the observed material(s) and likely designation of the materials if they required disposal. Actual classifications may vary from potential classifications based on detailed reviews of the chemical properties and Safety Data Sheet classifications at the time of disposal.
3. Items identified as being "potentially salvageable" are based on the nature of the item, and anticipated suitability for reuse at another City Facility and/or other agency.
4. Aerosol cans are identified as Universal Wastes for manifesting, transportation and disposal by the Generator. Subsequent to Plant closure, they must be manifested, transported, and disposed as Hazardous Wastes.
5. (#3) – Estimated quantity of the item, based on observations
6. X (if pressurized) – Waste designation if the canister is pressurized
7. X (MRSH) – Appliance subject to disposal regulation of "Materials that Require Special Handling" (MRSH)
8. X? – Category may apply if PCBs/mercury is present

AST: Aboveground storage tank
DAF: Dissolved Air Flotation
"Freon": designates any refrigerant
gal: gallon(s)
LCD: liquid crystal display
LED: Light emitting diode
Ni-cad: nickel-cadmium
PCBs: polychlorinated biphenyls
WWTP: wastewater treatment plant

Table 2. Potential PCB-Containing Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				OTHER CLASSIFICATIONS		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Salvage Items? (Note 3	
A2	Admin Building	Fluorescent lights & fixtures - #7 x 4' fixtures, 2 and 4 light fixtures		X			X		Possible PCB - In Laboratory area not replaced
C2	Old pump station	Fluorescent lights/fixtures, 6 double fixtures		X?			X		Possible PCB - Unknown if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (3)		X?			X		Interior lights Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (#3)		X?			X		Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (#4)		X?			X		Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (#4)		X?			X		Possible PCB – unclear if replaced
F3	Headworks	Fluorescent lights/fixtures (#2)		X?			X		Stairwell - Possible PCB – unclear if replaced
F3	Headworks	Fluorescent lights/fixtures (#14)		X?			X		Downstairs - Possible PCB – unclear if replaced
G2	Outfall Pump Station	Fluorescent lights/fixtures (#17)		X?			X		Stairwell & downstairs - Possible PCB – unclear if replaced

Notes:

1. Area Designations (i.e., A1 to G2) are shown on Figure 1
2. Classifications are based on the observed material(s) and likely designation of the materials if they required disposal. Actual classifications may vary from potential classifications based on detailed reviews of the chemical properties and Safety Data Sheet classifications at the time of disposal.
3. Items identified as being "potentially salvageable" are based on the nature of the item, and anticipated suitability for reuse at another City Facility and/or other agency.
4. (#3) – Estimated quantity of the item, based on observations
5. X? – Category may apply if PCB is present

PCBs: polychlorinated biphenyls

Table 3. Potential Universal Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Salvage Items? (Note 3)	
A1	Boiler Room	Universal waste pending disposal					X		Must be disposed offsite prior to shutdown
A1	DAF	High intensity lights					X		Combination of LED and sodium vapor; 1 located inside, 2 outside
A1	DAF	Aerosol cans			X (Note X)		X (Note X)		Loose spray cans
A1	Maintenance Building	Honeywell thermostat- For heater, gas heater				X?	X		On wall by man door; 2 natural gas space heaters
A1	Maintenance Building	Battery chargers					X	Yes	tools and radios
A1	Maintenance Building	Battery charger - 12 volt					X	Yes	automotive
A1	Maintenance Building	Misc. - power outlets - power strips					X	Yes	
A1	Maintenance Building	Fluorescent lights/fixtures (#14) (8 are extended)					X		
A1	Maintenance Building	Computer equipment (LCD monitor, general computer equipment, printers)					X	Yes	
A1	Maintenance Building	Flammables Cabinet - solvents, cleaners - spray can			X (Note 4)		X (Note 4)		also some PVC solvent/glue
A1	Maintenance Building	Paints			X (Note 4)		X (Note 4)		Spray cans, interior cabinet
A1	Maintenance Building	Aerosol cans of Solvents and cleaners			X (Note 4)		X (Note 4)		Spray cans, containers, interior cabinet
A2	Admin Building	Fluorescent lights/fixtures(29) inside		X			X		
A2	Admin Building	Fluorescent lights & fixtures - #7 x 4' fixtures, 2 and 4 light fixtures		X			X		Possible PCB - In Laboratory area not replaced
A2	Admin Building	Thermostat - wall mounted				X?	X		Control/Lunch room
A2	Admin Building	General electronic waste, Computers, printers, monitors, etc.					X	Yes	
A2	Admin Building	Computer server system					X	Yes	In Laboratory area

Table 3. Potential Universal Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Salvage Items? (Note 3)	
A2	Admin Building	Area lights					X		Seven outside, sodium vapor lamps
A2	Admin Building	Printer, DVR, TV, clock					X	Yes	In Laboratory area
A2	Admin Building	2-way Radios - w/chargers					X	Yes	In Laboratory area
A2	Admin Building	Recharging station - Ni-cad batteries					X		In Laboratory area
A2	Admin Building	Weather station					X	Yes	In Laboratory area/outside
A2	Admin Building	computers, printers, monitors (#3)					X	Yes	Front office
A2	Admin Building	Emergency lights, Hand held					X	Yes	Front office
A2	Admin Building	Defibrillator					X	Yes	Hallway
A2	Admin Building	Computers w/ monitors - (#2) monitor - (#1)					X	Yes	Control/Lunch room
A2	Admin Building	Emergency hand held lights					X		Control/Lunch room
A2	Admin Building	Aerosol cans, paint, air freshener, solvents, degreasers, cleaners			X (Note 4)		X (Note 4)		Back storage room
A2	Admin Building	Air spray, lubricants, cleaners (aerosols)/liquid cleaners			X (Note 4)		X (Note 4)		Janitorial closet
B1	Secondary Digester	Microwave tower & electronics					X	Yes	might salvage electronics
C1	Containers South of Maint Bldg	Used aerosol cans (#10-20)			X (Note 4)		X (Note 4)		in Deodorant container
C1	Maintenance Building	Rechargeable radios/charger					X	Yes	
C1	Maintenance Building	Batteries - rechargeable					X	Yes	
C1	Maintenance Building	Fluorescent lights/fixtures (double) (#6)					X		

Table 3. Potential Universal Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Salvage Items? (Note 3)	
C1	Maintenance Building	Radio/stereo & speakers					X	Yes	
C1	Maintenance Building	Battery charger (power tool batteries)					X	Yes	
C2	Old pump station	Fluorescent lights/fixtures, 6 double fixtures					X		
C2	Old pump station	Outdoor light (yellow)					X		sodium vapor lights
D1	In between digesters	Outdoor light					X		Sodium vapor lamp
D1	La Salina WWTP air blower bld.	Outdoor light (3) (yellow)					X		Sodium vapor lamp
D1	La Salina WWTP air blower bld.	Fluorescent lights/fixtures, 4 double fixtures					X		
D1	Sodium Hypochlorite Storage Area	Lubricant aerosol can			X (Note 4)		X (Note 4)		Lubricant spray can
E1	Sludge Drying Building	Fluorescent lights/fixtures (#6)					X		Inside power control room
E1	Sludge Drying Building	Fluorescent lights/fixtures lights (#22)					X		Upstairs
E1	Sludge Drying Building	emergency lights (#2)					X		1 in power control, 1 upstairs
E1	Sludge Drying Building	Fluorescent lights/fixtures (#13)					X		Downstairs
E1	Sludge Drying Building	Aerosol cans of Lubricants and oils and cleaners			X (Note 4)		X (Note 4)		
E3	Headworks	Fluorescent lights/fixtures (#23)					X		Upstairs
E3	Headworks	Fluorescent lights/fixtures (#16)					X		Upstairs
E3	Headworks	Fluorescent lights/fixtures, double (#8)					X		Upstairs
E3	Headworks	Spray cans and cleaners			X (Note 4)		X (Note 4)		Upstairs

Table 3. Potential Universal Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Salvage Items? (Note 3)	
E3	Headworks bathroom	Fluorescent lights/fixtures (#1)					X		Installed
E3	Headworks bathroom	Aerosol cans, Cleaners & air fresheners			X (Note 4)		X (Note 4)		
E3	Headworks control room	Box of 40 watt tubes				X?	X	Yes	Box of 40 watt tubes
E3	Headworks control room	Fluorescent lights/fixtures (#7)					X		Installed
E3	Headworks control room	Fluorescent lights/fixtures (#2)					X		Not installed
E3	Headworks control room	boxes spare Fluorescent lights (#2)					X		Spare bulbs
E3	Inside Storage seatainer	Fluorescent lights/fixtures (#27)		X			X		Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (3)		X			X		Interior lights Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (#3)		X			X		Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (#4)		X			X		Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (#4)		X			X		Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Spray cans (aerosol)			X (Note X)		X (Note X)		Approx. 20 aerosol cans
F1	Inside Storage seatainer	Spray cans, paint thinner & lubricants			X (Note X)		X (Note X)		Approx. 45 cans
F1	Inside Storage seatainer	Aerosol cans			X (Note X)		X (Note X)		Approx. 25
F3	Headworks	Fluorescent lights/fixtures (#2)		X			X		Stairwell Possible PCB – unclear if replaced
F3	Headworks	Fluorescent lights/fixtures (#14)		X			X		Downstairs Possible PCB – unclear if replaced
F3	So Pacific Pump Station	Fluorescent lights/fixtures (#2)					X		Hatch interior

Table 3. Potential Universal Wastes

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)				Other Classifications		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Salvage Items? (Note 3)	
G2	Outfall Pump Station	Fluorescent lights/fixtures (#17)		X			X		Stairwell & downstairs Possible PCB – unclear if replaced
G2	Outfall Pump Station	Aerosol can Lubricant/solvent			X (Note X)		X (Note X)		
Site wide	Site wide	outdoor lights on posts (approx. #76)				X	X		Single, double, and triple light posts sodium vapor lamps

Notes:

1. Area Designations (i.e., A1 to G2) are shown on Figure 1
2. Classifications are based on the observed material(s) and likely designation of the materials if they required disposal. Actual classifications may vary from potential classifications based on detailed reviews of the chemical properties and Safety Data Sheet classifications at the time of disposal.
3. Items identified as being "potentially salvageable" are based on the nature of the item, and anticipated suitability for reuse at another City Facility and/or other agency.
4. (#3) – Estimated quantity of the item, based on observations
5. X? – Category may apply if PCBs/mercury is present
6. X (if pressurized) – Waste designation if the canister is pressurized

AST: aboveground storage tank
DAF: Dissolved Air Flotation
"Freon": designates any refrigerant
gal: gallon
lb: pound(s)
LED: Light emitting diode
Ni-cad: nickel-cadmium
PCBs: polychlorinated biphenyls
WWTP: wastewater treatment plant

Table 4. Potential Salvageable Items and Materials

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				OTHER CLASSIFICATIONS		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
A1	Boiler Room	Tubes of Silicon caulking			X			Yes	
A1	DAF	Praestol R133H Flocculant 2,300 lb poly tank			X			Yes	
A1	DAF/ Flammable Cabinet	5-gal containers of oil (some 22.7 liter) approx #30			X			Yes	Flammable Cabinet
A1	DAF/ Flammable Cabinet	Quarts of oil, gear oil			X			Yes	Flammable Cabinet
A1	Maintenance Building	Electric space heater			X (MRSH)			Yes	portable
A1	Maintenance Building	Oxy-acetylene torch w/ gas cylinders			X (if pressurized)			Yes	
A1	Maintenance Building	Refrigerator (mini)			X (MRSH)			Yes	Freon must be removed prior to disposal of refrigerator as waste
A1	Maintenance Building	Honda Generator EU 6500 LS			X (ignitable)			Yes	gasoline fuel, oil must be drained before disposal
A1	Maintenance Building	Battery chargers					X	Yes	tools and radios
A1	Maintenance Building	Battery charger - 12 volt					X	Yes	automotive
A1	Maintenance Building	Misc - power outlets - power strips					X	Yes	
A1	Maintenance Building	Computer equipment (LCD monitor, general computer equipment, printers)					X	Yes	
A1	Maintenance Building	Silicon tubes, grease guns						Yes	
A1	Maintenance Building	Air compressor (white) (machine shelf)						Yes	State serial No. A011292-08 N.B. #/SER, #60592 (Oil must be drained prior to disposal)
A1	Maintenance Building	Air compressor (green)						Yes	No permit visible, Oil must be drained prior to disposal
A2	Admin Building	Small calibration gas cylinders, oxygen, nitrogen -Compressed gas			X (if pressurized)			Yes	

Table 4. Potential Salvageable Items and Materials

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				OTHER CLASSIFICATIONS		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
A2	Admin Building	Washer and dryer			X (MRSH)			Yes	appliances
A2	Admin Building	Microwave			X (MRSH)			Yes	Control/Lunch room
A2	Admin Building	Refrigerator			X (MRSH)			Yes	Control/Lunch room
A2	Admin Building	General electronic waste, Computers, printers, monitors, etc.					X	Yes	
A2	Admin Building	Computer server system					X	Yes	In Laboratory area
A2	Admin Building	Printer, DVR, TV, clock					X	Yes	In Laboratory area
A2	Admin Building	2-way Radios - w/chargers					X	Yes	In Laboratory area
A2	Admin Building	Weather station					X	Yes	In Laboratory area/outside
A2	Admin Building	computers, printers, monitors (#3)					X	Yes	Front office
A2	Admin Building	Emergency lights, Hand held					X	Yes	Front office
A2	Admin Building	Defibrillator					X	Yes	Hallway
A2	Admin Building	Computers w/ monitors - (#2) monitor - (#1)					X	Yes	Control/Lunch room
A2	West of Admin	GE Transformer dry, 9T23B3876						Yes	Dry transformer, not hazardous, no PCB
A2	West of Admin	Transformer D3718965729 1676						Yes	not applicable - SDG&E Property
B1	Secondary Digester	Praestol R133h Flocculant			X			Yes	250 gal poly tote
B1	Secondary Digester	Microwave tower & electronics					X	Yes	might salvage electronics
B1	Secondary Digester	CHP Cogeneration unit						Yes	Cogen unit - by others - assume salvage or removed

Table 4. Potential Salvageable Items and Materials

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				OTHER CLASSIFICATIONS		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
C1	Containers South of Maint Bldg	Accu-TAB calcium hypochlorite tabs, 55 lb bucket	Oxidizer/ Corrosive Acid		X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Compressed Gas Cylinders: oxygen (1 full), helium & Argon (1 full)			X (if pressurized)			Yes	In Compressed Gas Cylinder locker
C1	Containers South of Maint Bldg	Sodium hypochlorite 55-gal poly drum (#1)	Corrosive		X			Yes	in Sodium hypochlorite container
C1	Containers South of Maint Bldg	ACCU-TAB calcium hypochlorite tabs; 55 lb bucket	Oxidizer/ Corrosive		X			Yes	in Sodium hypochlorite container
C1	Containers South of Maint Bldg	sodium hypochlorite poly drums 4 x 55-gal	Oxidizer/ Corrosive		X			Yes	in Sodium hypochlorite container
C1	Containers South of Maint Bldg	Muriatic acid (#12) boxes of #4 1-gal bottles + #2 5-gal poly	Acid		X			Yes	in Muriatic acid container
C1	Containers South of Maint Bldg	Eucalyptus concentrate - (#7) gal			X (ignitable)			Yes	Flammable - alcohol
C1	Containers South of Maint Bldg	Elimin-odor/ lemon - (#11) gal			X (ignitable)			Yes	Flammable - Ethanol
C1	Containers South of Maint Bldg	Chem search 777 - corrosion preventer #2 x 2-1/2 gal			X			Yes	
C1	Containers South of Maint Bldg	CIP cleaner - 5 gal. Sodium thiosulfate crystals - #10 x 50 lb			X			Yes	
C1	Containers South of Maint Bldg	Green sweeping compound (#2) (100 lb)			X			Yes	Spill equipment container
C1	Containers South of Maint Bldg	Sodium thiosulfate (#10) (50 lb)			X			Yes	in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Tornado Acid CIP cleaner (5 gal bucket)	Acid		X			Yes	in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Neutralizer absorbant	Base		X			Yes	in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Eucalyptus odorant concentrate (#2) gallon bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Elim-odor (#11) gallon bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Zep cleaner, cherry odor (#8) gallon bottles			X			Yes	in Deodorant container

Table 4. Potential Salvageable Items and Materials

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				OTHER CLASSIFICATIONS		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
C1	Containers South of Maint Bldg	State cleaner, apple odor, (#12) morning fresh odor (#1) gallons			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Zep cleaner, DEO-1 Or DEO-3 (#3) gallons, bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Unifresh, cherry odor (#1) gallon, plastic bottles			X			Yes	in Deodorant container
C1	Maintenance Building	Parts washer - Armakleen cleaner solution			X			Yes	Parts cleaner and drum of cleaner solution
C1	Maintenance Building	Propane tank - 10 gal			X (if pressurized)			Yes	
C1	Maintenance Building	Compressed gas cylinders (oxy-acetylene/Heli arc welding)			X (if pressurized)			Yes	Deposit on cylinders, 100CF oxygen, helium/argon
C1	Maintenance Building	Rechargeable radios/charger					X	Yes	
C1	Maintenance Building	Batteries - rechargeable					X	Yes	
C1	Maintenance Building	Radio/stereo & speakers					X	Yes	
C1	Maintenance Building	Battery charger (power tool batteries)					X	Yes	
C1	Maintenance Building	Small portable air compressor						Yes	6 gal, 150 psi
C1	North of Maint. Bldg.	Air compressor, Serial # A010956-13						Yes	
C1	South of Maint Building	Propane tank ~10 gallon			X (if pressurized)			Yes	Non-hazardous if empty/depressurized
C2	Reclaimed water pump station	Air compressor, green, upright tank						Yes	No permit, Oil must be drained prior to disposal
D1	Waste gas burner	(2) 10 gal propane tank			X (if pressurized)			Yes	Connected to burner - pilot gas
E3	Headworks control room	Outside light bulb spare bulb (approx. #12)				X		Yes	sodium vapor lights
E3	Headworks control room	Box of 40 watt tubes				X?	X	Yes	Box of 40 watt tubes

Table 4. Potential Salvageable Items and Materials

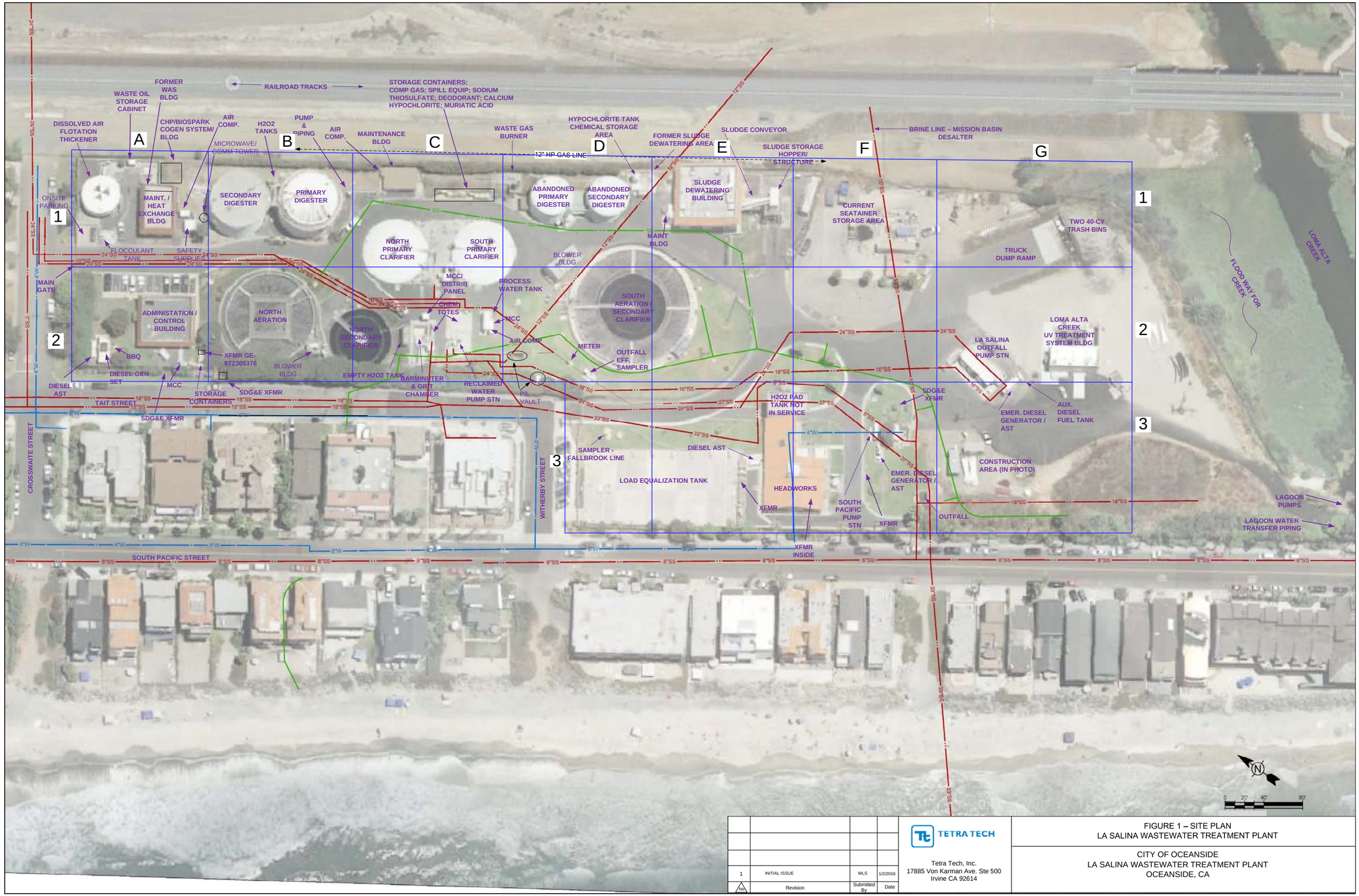
AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL HAZARDOUS CLASSIFICATIONS (Note 2)				OTHER CLASSIFICATIONS		NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	
F3	Headworks	Green air compressor						Yes	State serial #A010955-13 (Oil must be drained prior to disposal) NIB#/SER#l979124 On wheels
F3	Headworks	Green air compressor						Yes	State serial #A055606-08 (Oil must be drained prior to disposal) NIB#/SER#L1206004 Upright
F3	So Pacific Pump Station	200 Gal diesel fuel AST for generator			X (if not drained, washed)			Yes	Diesel fuel must be removed from AST
G2/3	Outfall Pump Station	Diesel Fuel ASTs 300 gal and 500 gal for generator			X			Yes	Diesel fuel must be removed from AST
Site wide	Site wide	Fire Extinguishers			X			Yes	Dry chemical Fire extinguishers need to be classified based on type of dry chemical used in each extinguisher. May be hazardous

Notes:

1. Area Designations (i.e., A1 to G2) are shown on Figure 1
2. Classifications are based on the observed material(s) and likely designation of the materials if they required disposal. Actual classifications may vary from potential classifications based on detailed reviews of the chemical properties and Safety Data Sheet classifications at the time of disposal.
3. Items identified as being "potentially salvageable" are based on the nature of the item, and anticipated suitability for reuse at another City Facility and/or other agency.
4. (#3) – Estimated quantity of the item, based on observations
5. X (MRSH) – Appliance subject to disposal regulation of "Materials that Require Special Handling" (MRSH)
6. X (if pressurized) – Waste designation if the canister is pressurized
7. X? – Category may apply if PCBs/mercury is present

AST: Aboveground storage tank
DAF: Dissolved Air Flotation
gal: gallon(s)
"Freon": designates any refrigerant
LCD: liquid crystal display
LED: Light emitting diode
Ni-cad: nickel-cadmium
PCBs: polychlorinated biphenyls
WWTP: wastewater treatment plant

FIGURES



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TETRA TECH

Tetra Tech, Inc.
17885 Von Karman Ave. Ste 500
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FIGURE 1 – SITE PLAN
LA SALINA WASTEWATER TREATMENT PLANT

CITY OF OCEANSIDE
LA SALINA WASTEWATER TREATMENT PLANT
OCEANSIDE, CA

APPENDIX A REGULATORY REQUIREMENTS FOR HAZARDOUS WASTES

Defining Hazardous Waste

This section contains information on:

What is a Hazardous Waste?
- I. Listed Waste
- II. Characteristic Hazardous Waste
- III. Used Oil
- IV. Mixture & Derived-From Rules
- V. Contained-In Policy

Links to Additional Resources for Hazardous Waste Identification

What is a Hazardous Waste?

Hazardous waste is a waste with properties that make it potentially dangerous or harmful to human health or the environment. The universe of hazardous wastes is large and diverse. Hazardous wastes can be liquids, solids, or contained gases. They can be the by-products of manufacturing processes, discarded used materials, or discarded unused commercial products, such as cleaning fluids (solvents) or pesticides. In regulatory terms, a hazardous waste is a waste that appears on one of the four RCRA[1] hazardous wastes lists (the F-list, K-list, P-list, or U-list) or that exhibits one of the four characteristics of a hazardous waste - ignitability, corrosivity, reactivity, or toxicity. However, materials can be hazardous wastes even if they are not specifically listed or don't exhibit any characteristic of a hazardous waste. For example, "used oil," products which contain materials on California's M-list, materials regulated pursuant to the mixture or derived-from rules, and contaminated soil generated from a "clean up" can also be hazardous wastes. To view the hazardous waste regulations and statutes, go to: http://www.dtsc.ca.gov/LawsRegsPolicies/index.cfm

Click below to take a self-paced internet course on hazardous waste identification
http://ccelearn.csus.edu/wasteclass/intro/intro_01.html

The following paragraphs provide an overview of the various ways that a waste may be identified as hazardous waste.

I. Listed Wastes

By regulation, some specific wastes are hazardous wastes. These wastes are incorporated into five lists.

These five lists are organized into four categories:

• **The F-list (non-specific source wastes):** This list identifies wastes from many common manufacturing and industrial processes, such as solvents that have been used for cleaning or degreasing. Since the processes producing these wastes occur in many different industry sectors, the F-listed wastes are known as wastes from non-specific sources. (Non-specific meaning they don't come from one specific industry or one specific industrial or manufacturing process.) The F-list appears in the hazardous waste regulations in 22CCR Section 66261.31.

• **The K-list (source-specific wastes):** This list includes certain wastes from specific

industries, such as petroleum refining or pesticide manufacturing. Also, certain sludges and wastewaters from treatment and production processes in these specific industries are examples of source-specific wastes. The K-list appears in the hazardous waste regulations in 22CCR Section 66261.32.

• **The P-list and the U-list (discarded commercial chemical products):** These lists include specific commercial chemical products that have not been used, but that will be (or have been) discarded. Industrial chemicals, pesticides, and pharmaceuticals are example of commercial chemical products that appear on these lists and become hazardous waste when discarded. The P- and U-lists appear in the hazardous waste regulations in 22CCR Subsections 66261.33(e) and (f).

• **M-listed Wastes (discarded mercury-containing products):** This list includes certain wastes known to contain mercury, such as fluorescent lamps, mercury switches and the products that house these switches, and mercury-containing novelties. For additional information see DTSC's mercury web page.

II. Characteristic Hazardous Wastes

Wastes may be hazardous wastes if they exhibit any of the four characteristics of a hazardous waste (ignitability, corrosivity, reactivity, and toxicity) as defined in Article 3 of Chapter 11 of the hazardous waste regulations (Sections 66261.21 to 66261.24).

These four characteristics are:

Ignitability – Ignitable wastes can create fires under certain conditions, undergo spontaneous combustion, or have a flash point less than 60°C (140°F). Examples include waste oil and used solvents. The characteristic of ignitability is defined in section 66261.21 of the hazardous waste regulations. Test methods that may be used to determine if a waste exhibits the characteristic of ignitability include the Pensky-Martens Closed-Cup Method for Determining Ignitability, the Setaflash Closed-Cup Method for Determining Ignitability, and the Ignitability of Solids (U.S. EPA Test Methods, SW-846 Methods: 1010, 1020, and 1030, respectively.). 22CCR 66261.21.

Corrosivity – Corrosive wastes are materials, including solids, that are acids or bases, or that produce acidic or alkaline solutions. Aqueous wastes with a pH less than or equal to 2.0 or greater than or equal to 12.5 are corrosive. A liquid waste may also be corrosive if it is able to corrode metal containers, such as storage tanks, drums, and barrels. Spent battery acid is an example. The characteristic of corrosivity is defined in section 66261.22 of the hazardous waste regulations. Test methods that may be used to determine if a waste exhibits the characteristic of corrosivity are pH Electronic Measurement and Corrosivity Towards Steel (U.S. EPA Test Methods, SW-846 Methods: 9040 and 1110 respectively.). 22CCR 66261.22.

Reactivity – Reactive wastes are unstable under normal conditions. They can cause explosions or release toxic fumes, gases, or vapors when heated, compressed, or mixed with water. Examples include lithium-sulfur batteries and unused explosives. The characteristic of reactivity is defined in section 66261.23 of the hazardous waste regulations. There are currently no test methods available for reactivity. Instead wastes are evaluated for reactivity using the narrative criteria set forth in the hazardous waste regulations. 22CCR 66261.23.

Toxicity – Toxic wastes are harmful or fatal when ingested or absorbed (e.g., wastes

containing mercury, lead, DDT, PCBs, etc.). When toxic wastes are disposed, the toxic constituents may leach from the waste and pollute ground water. The characteristic of toxicity is defined in section 66261.24 of the hazardous waste regulations. It contains eight subsections, as described below. A waste is a toxic hazardous waste if it is identified as being toxic by any one (or more) of the eight subsections of this characteristic.
22CCR 66261.24.

1. TCLP: Toxic as defined through application of a laboratory test procedure called the Toxicity Characteristic Leaching Procedure (TCLP - U.S. EPA Test Method 1311). The TCLP identifies wastes (as hazardous) that may leach hazardous concentrations of toxic substances into the environment. The result of the TCLP test is compared to the Regulatory Level (RL) in the table in subsection 66261.24(a)(1) of the hazardous waste regulations. This criterion does not apply to wastes that are excluded from regulation under the Resource Conservation and Recovery Act.

2. Totals and WET: Toxic as defined through application of laboratory test procedures called the "total digestion" and the "Waste Extraction Test" (commonly called the "WET"). The results of each of these laboratory tests are compared to their respective regulatory limits, the Total Threshold Limit Concentrations (TTLCs) and the Soluble Threshold Limit Concentrations (STLCs), which appear in subsection 66261.24(a)(2) of the hazardous waste regulations.

3. Acute Oral Toxicity: Toxic because the waste either is an acutely toxic substance or contains an acutely toxic substance, if ingested. As stated in subsection 66261.24(a)(3), a waste is identified as being toxic if it has an acute oral LD_{50} less than 2,500 mg/kg. A calculated oral LD_{50} may be used.

4. Acute Dermal Toxicity: Toxic because the waste either is an acutely toxic substance or contains an acutely toxic substance, if dermal exposure occurs. As stated in subsection 66261.24(a)(4), a waste is identified as being toxic if it has an dermal LC_{50} less than 4,300 mg/kg. A calculated dermal LD_{50} may be used.

5. Acute Inhalation Toxicity: Toxic because the waste either is an acutely toxic substance or contains an acutely toxic substance, if inhaled. As stated in subsection 66261.24(a)(5), a waste is identified as being toxic if it has an dermal LC_{50} less than 10,000 mg/kg. U.S. EPA Test Method, SW-846 Methods: 3810, Headspace (formerly Method 5020) may be used to "test out" (for volatile organic substances).

6. Acute Aquatic Toxicity: Toxic because the waste is toxic to fish. A waste is aquatically toxic if it produces an LC_{50} less than 500 mg/L when tested using the "Static Acute Bioassay Procedures for Hazardous Waste Samples". This test procedure is available at:
http://www.dtsc.ca.gov/HazardousWaste/upload/HWMP_bioassay_report.pdf

7. Carcinogenicity: Toxic because it contains one or more carcinogenic substances. As stated in subsection 66261.24(a)(7), a waste is identified as being toxic if it contains any of the specified carcinogens at a concentration of greater than or equal to 0.001 percent by weight.

8. Experience or Testing: Pursuant to subsection 66262.24(a)(8), a waste may be toxic (and therefore, a hazardous waste) even if it is not identified as toxic by any of the seven criteria above. At the present time, only wastes containing ethylene glycol (e.g.,

spent antifreeze solutions) have been identified as toxic by this subsection.

III. Used Oil: In California, waste oil and materials that contain or are contaminated with waste oil are usually regulated as hazardous wastes if they meet the definition of "Used Oil" even if they do not exhibit any of the characteristics of hazardous waste. The term "used oil" is a legal term which means any oil that has been refined from crude oil, or any synthetic oil that has been used and, as a result of use, is contaminated with physical or chemical impurities. Other materials that contain or are contaminated with used oil may also be subject to regulation as "used oil" under Part 279 of Title 40 of the Code of Federal Regulations. http://www.epa.gov/epahome/cfr40.htm

IV. Mixture & Derived-From Rules: When evaluating materials that are mixtures or that are residuals resulting from processing other materials, you should check to see if the hazardous waste mixture-rule or derived-from rule applies. The hazardous waste mixture and derived-from rules are located in 22CCR Section 66261.3. There are also additional mixture rules specifically for mining wastes and for used oil. These rules are intended to ensure that mixtures and residuals containing hazardous wastes are regulated in a manner that is protective of human health and the environment.

V. Contained-In Policy: Environmental media (soil, groundwater and surface water) are not normally considered wastes. However, when environmental media are excavated (and stored or transported) for disposal at another location, the environmental media may be regulated as hazardous waste if it contains hazardous waste, including both listed and characteristic hazardous wastes. For example, soil contaminated with lead is often a hazardous waste because the lead "contained-in" the soil is a hazardous waste.

Additional Information and Resources:

Hazardous Waste Determination: As described above, the hazardous waste regulations set forth criteria that identify wastes as hazardous wastes. Although they may meet the definition of hazardous waste, some wastes are specifically excluded or exempted from regulation as hazardous waste (e.g., chlorofluorocarbon refrigerants that are reclaimed for reuse). The process of determining if a waste is a hazardous waste is called the "hazardous waste determination". To ensure an exclusion or exemption is not overlooked, generators should always follow the Hazardous Waste Determination procedure provided in 22CCR Section 66262.11 of the hazardous waste regulations when evaluating their wastes.

Click below to take a self-paced, internet course on hazardous waste identification
http://ccelearn.csus.edu/wasteclass/intro/intro_01.html

Hazardous Waste Recycling: A material must be a "waste" in order to be a hazardous waste. Generally, a waste is any material that someone possesses, but does not have a use for. In regulatory terms, a waste is any discarded material that is not otherwise excluded. The process of determining if something is a waste is called "waste Identification." Materials may not be wastes if they are recycled in certain ways, i.e., they may be excluded from the definition of waste in 22CCR Section 66261.2 of the hazardous waste regulations. Besides 22CCR Section 66261.2, you will have to refer to Health and Safety Code Sections 25120.5, 25120.55, 25121.5, and 25143.2 (and perhaps others) when making a waste determination.

Click below to review the DTSC Hazardous Waste and Recycling Letters
http://www.dtsc.ca.gov/HazardousWaste/CSERFS/index.cfm

Test Methods: Sampling and analysis of materials and wastes for hazardous waste identification purposes shall be in accordance with U.S. EPA's publication: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, commonly referred to just as "SW-846." SW-846 is available online at:
http://www.epa.gov/epawaste/hazard/testmethods/sw846/index.htm

Additional Links:
DTSC Hazardous Waste and Recycling Letters
http://www.dtsc.ca.gov/HazardousWaste/CSERFS/index.cfm

Q&A for Specific Hazardous Waste and Hazardous Substances
http://www.dtsc.ca.gov/InformationResources/

Information for universal waste
http://www.dtsc.ca.gov/InformationResources/Regulatory_Assistance_Frequently_Asked_Questions.cfm#Is_it_a_Hazardous_Waste_or_Isn%27t_It

US EPA training module – Introduction to Hazardous Waste Identification
http://www.epa.gov/osw/inforesources/pubs/training/hwid05.pdf

RCRA online
http://www.epa.gov/epawaste/inforesources/online/index.htm

Click below to take a self-paced, internet course on hazardous waste identification
http://ccelearn.csus.edu/wasteclass/intro/intro_01.html

Comments or Questions:
If you still have questions about hazardous waste identification, or if you have suggestions to improve this document, call (916) 324-2428 or send email to rao@dtsc.ca.gov

[1] The Resource Conservation and Recovery Act. As used on this web page, "hazardous waste regulations" refers to Chapters 10 through 32 of Division 4.5 of Title 22 of the California Code of Regulations

Last updated on 09/15/14

Fact Sheet
October 2015

Aerosol Can Waste Management

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

HAZARDOUS WASTE MANAGEMENT

DTSC is one of six Boards and Departments within the California Environmental Protection Agency. DTSC's mission is to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California

California Environmental Protection Agency

California Health and Safety Code, Division 20, Article 9 Section 25201.16 reduces the regulatory and financial burden of managing hazardous waste aerosol cans by designating them as "universal waste." Universal waste handlers may process the cans onsite without a permit under certain conditions.

When Are Aerosol Cans Hazardous Wastes?

Aerosol cans may be hazardous wastes when they are non-empty and will no longer be used. Aerosol cans are not hazardous wastes when they have been emptied of contents. Non-empty Aerosol cans are commonly discarded for a number of reasons, such as: the spray mechanism is damaged or clogged and no longer works, the propellant has been exhausted, or the owner decides that he or she no longer wants or needs the product.



If the waste non-empty aerosol can contains pressurized contents that may be hazardous, if the propellant is ignitable or toxic, or the product itself is ignitable, corrosive, or toxic then the waste non-empty aerosol can is a hazardous waste. Aerosol cans containing paint, pesticides, and cleaning products are several examples of materials that may be hazardous when discarded. Most aerosol cans use hydrocarbons, such as propane, butane, or LPG gas as the propellant. Hence, most waste aerosol cans that are not empty are ignitable hazardous wastes.

Waste aerosol cans may be managed in accordance universal waste management standards found in California Code of Regulations, title 22, chapter 23, in addition to the requirements in Health and Safety Code section 25201.16. However, the universal waste exemption for households and "conditionally exempt small quantity universal waste generators" does not apply to waste non-empty aerosol cans (see Health and Safety Code (Health & Saf. Code, § 25201.16(d)). For more information or a listing of universal wastes, see the Department of Toxic Substances Control (DTSC) fact sheet entitled "Managing Universal Waste in California" (available at http://www.dtsc.ca.gov/PublicationsForms/HWM_FS_UWR.pdf), and California Code of Regulations (Cal Code Regs.), title 22, chapter 23.

Do Waste Aerosol Can Management Standards Apply to Me?

Waste aerosol can management standards apply to you if you generate or accumulate hazardous waste aerosol cans in accordance with Health and Safety Code, section 25201.16.

California Code of Regulations, title 22, section 66273.8 exempts households and certain very small quantity generators of universal wastes from requirements that apply to larger universal waste handlers. These exemptions do not apply to waste aerosol cans (Health & Saf. Code, § 25201.16(d)(2)). Homeowners and small quantity generators of waste non-empty aerosol cans are not allowed to dispose of the cans as solid waste (i.e., put them in the trash). However, anyone may dispose of empty aerosol cans as solid waste, or recycle empty cans as scrap metal (Cal. Code Regs., tit. 22, § 66261.6(a)(3)(B)). For more information about disposal of empty aerosol cans, see the DTSC fact sheet entitled "Managing Empty Containers" (available at https:// www.dtsc.ca.gov/ HazardousWaste/upload/Managing-Empty-Containers.pdf).

Note: Offsite commercial processors of waste aerosol cans are not universal waste handlers and may not process waste aerosol cans as universal waste (Health & Saf. Code, § 25201.16(h)(1)).

Requirements for Handling Universal Waste Aerosol Cans

All handlers of universal waste aerosol cans must comply with the requirements of Health and Safety Code section 25201.16 (e), (f), (g), and (k). If you are a handler who processes universal waste aerosol cans, you are subject to additional requirements in section 25201.16 (h), (i), and (j). You must:

- Train employees on the proper procedure for sorting and processing waste aerosol cans and handling emergencies;
- Process the universal waste aerosol cans in a well-ventilated area;
- Manage the universal waste aerosol cans in a manner and in equipment designed to prevent fire, explosion, and unauthorized releases to the environment;
- Universal waste aerosol cans may be accumulated for up to one year at each site.
- Keep containers closed that are used to accumulate or transport processed aerosol cans or waste drained from the cans, except when waste is being added or removed;
- Cover containers at the end of each workday that are used to accumulate universal waste aerosol cans for processing or shipping;
- Place accumulation containers in a location with sufficient ventilation to prevent formation of an explosive atmosphere;
- Place containers of processed cans, drained can contents or cans generated offsite on a surface that is free of cracks and gaps, and is sufficiently impervious and bermed to contain leaks;
- Accumulate and transport universal waste aerosol cans in containers that are structurally sound, and compatible with the contents of the can, and show no evidence of leaks, spills, or damage that could cause leaks;
- Place universal waste aerosol cans in containers that are designed, built, and maintained to withstand pressures reasonably expected during storage and transportation;
- During accumulation, sort cans by type and compatibility of contents;
- Keep containers of flammable wastes a safe distance from heat and open flames;
- Segregate incompatible materials in separate containers;
- Label containers of universal waste aerosol cans with one of the following phrases: "Universal Waste Aerosol Cans," "Waste Aerosol Cans," or "Used Aerosol Cans;"
- Transport clearly marked containers in a way that prevents, fire, explosion, or release of container contents.

Additional Requirements for Processing Aerosol Cans as Universal Waste

These requirements are in addtion to the previously listed requirements for handling universal waste aerosol cans. Universal waste handlers may process aerosol cans through puncturing, draining, and crushing the universal waste aerosol cans (Health & Saf. Code), section 25201.16. When accumulating, or processing universal waste aerosol cans, you must comply with the requirements of (Health & Saf. Code, § 25201.16(h), (i), and (j)):

- Place the unit used to process aerosol cans above a non-earthen floor that is free of cracks or gaps and is sufficiently impervious and bermed to contain leaks and spills;
- Develop and implement a written operating procedure for safely processing universal waste aerosol cans and handling emergencies;
- Provide a spill clean-up kit and promptly clean-up any spills or leaks of the contents of universal waste aerosol cans;
- Promptly transfer the contents of the drained aerosol cans from the processing device to appropriate containers that meet specified requirements;
- Waste generated from processing waste aerosol cans, including residues removed from those cans, may be hazardous waste. This includes potentially acutely and extremely hazardous wastes. Any waste deemed generated during processing must be properly characterized and should be managed accordingly (Health & Saf. Code, § 25201.16(i)).

Commercial Processing of Waste Aerosol Cans

The aerosol can puncturing and draining provisions do not apply to commercial entities such as offsite hazardous waste facilities, hazardous waste transporters, or transfer facilities. Offsite commercial processors remain subject to all DTSC permitting, reporting, record keeping, and facility requirements for the management of hazardous waste under Health and Safety Code and California Code of Regualtions, including obtaining proper authorization for the type of treatment they conduct (Health & Saf. Code, § 25201.16(a)(7) and 25201.16(h)(1)); Cal. Code Regs., tit. 22, § 66273.9).

Note: If the contents drained from the cans are hazardous, you must continue to manage the drained waste residues as hazardous wastes (Health & Saf. Code, § 25201.16(i)).

Notification Requirements

Health and Safety Code section 25201.16(j) requires you to notify your local CUPA if you process universal waste aerosol cans. Univeral Waste handlers are able to process the cans onsite without a permit or other authorization from DTSC or the local Certified Unified Program Agency (CUPA).

Also, it is the handler's responsibility to ensure that equipment used for processing the cans meets the requirements of Health and Safety Code, section 25201.16(e). However, as previously mentioned, if you process universal waste aerosol cans you must notify your local CUPA. The notification can be given in person or by letter, via certified mail, with return receipt requested. Some CUPAs may have a notification form that can be completed. In the absence of a CUPA, send the notification to the agency authorized to implement and enforce the hazardous waste generator program in your jurisdiction. Also, notify the CUPA or authorized agency within 30 days of any change in operation that changes the information you originally provided.

Who is able to process Aerosol Cans as Universal Waste?

Only a "universal waste handler," as legally defined, may process universal waste hazardous waste aerosol cans. [See California Code of Regulations, title 22, section 66273.9 Health and Safety Code subsections 25201.16 (a)(7) and (h)(1)] Offsite commercial processors of hazardous waste aerosol cans are prohibited from processing aerosol cans under the universal waste aerosol can statute (Health & Saf. Code, § 25201.16(h)(1)). DTSC construes the statutorily undefined word, commercial, to apply to any person, as that word is defined in California Code of Regulations, title 22, section 66260.10, that processes aerosol cans in exchange for compensation. Some examples of entities that are offsite commercial processors include, but are not limited to: individuals from another generator's site, registered hazardous waste transporters, operators of hazardous waste treatment, storage and/or disposal facilities, and operators of transportable treatment units. Such entities are not universal waste aerosol can handlers, as defined, and hence, are prohibited from processing aerosol cans as authorized treatment of universal wastes. These offsite commercial processing entities must manage hazardous waste aerosol cans as fully regulated offsite generated hazardous wastes, including obtaining appropriate authorizations or hazardous waste facility permits for conducting hazardous waste treatment of aerosol cans. (Health & Saf. Code, § 25201.16(h)(1) and 25201). There is however one exception to this rule which applies to permitted household hazardous waste collection facilities. (The permit-by-rule authorizations for these facilities makes them responsible for compliance with both the standards for offsite hazardous waste facilities and also the standards for generators for the hazardous wastes collected by these facilities. See the Final Statement of Reasons for the Permit-By-Rule Regulations for Permanent Household Hazardous Waste Collection Facilities, R-95-03).

Disclaimer

This fact sheet provides general information about managing universal waste aerosol cans. Consult the actual statutes and regulations before making any decisions that may impact regulatory compliance.

For more information, contact the DTSC office nearest you, or call the Regulatory Assistance Office at (800)72TOXIC (1-800-728-6942). From outside California, call (916)255-3545.

DTSC Headquarters
1001 I Street
Sacramento, CA 95814-2828

Berkeley Office
700 Heinz Avenue
Suite 200
Berkeley, CA 94710-2721

Chatsworth Office
9211 Oakdale Avenue
Chatsworth, CA 91311-6505

Clovis Office
1515 Tollhouse Road
Clovis, CA 93611-0522

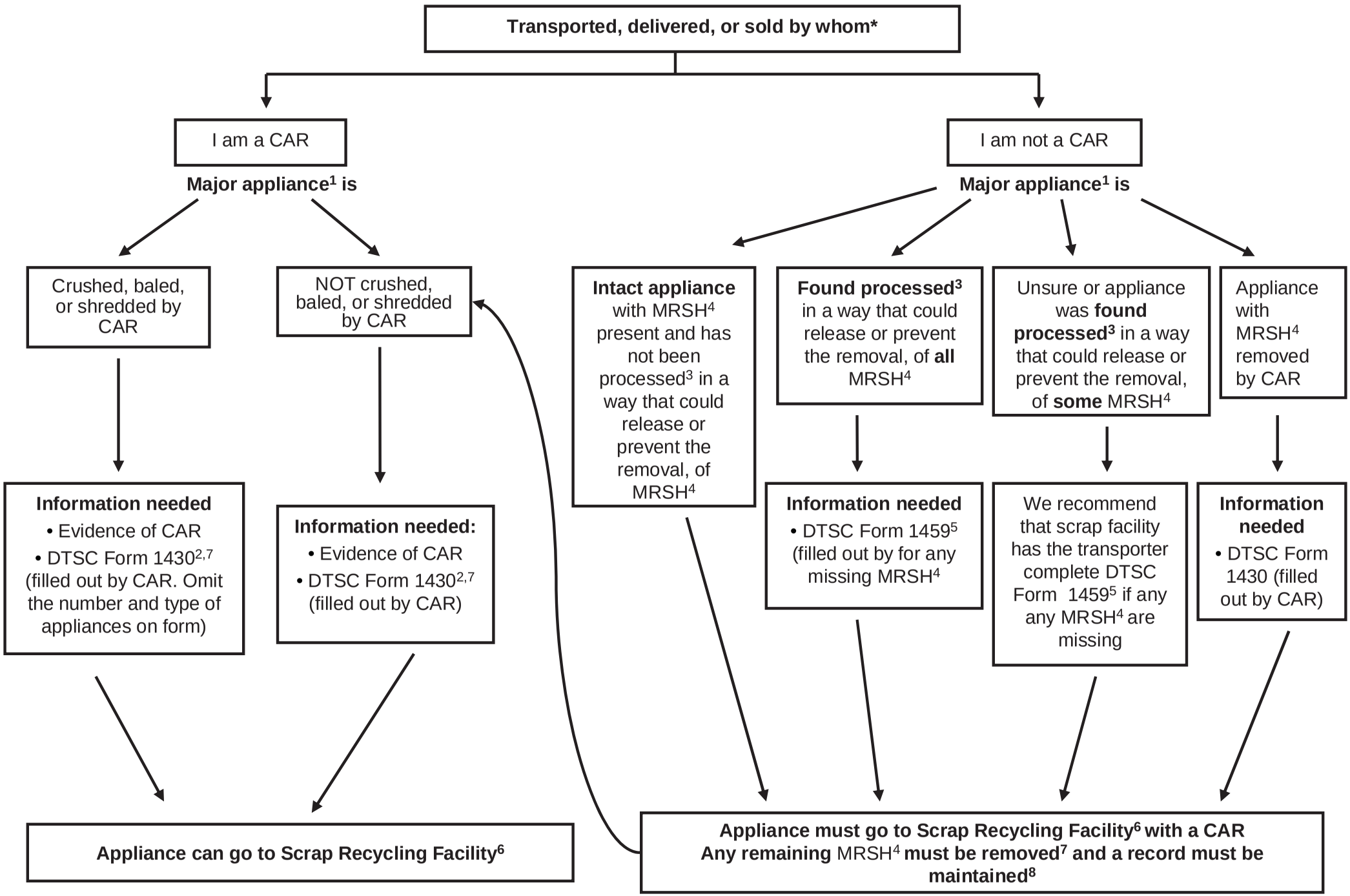
Cypress Office
5796 Corporate Avenue
Cypress, CA 90630-4732

Sacramento Office
8800 Cal Center Drive
Sacramento, CA 95826-3200

San Diego Office
2375 Northside Drive, Suite
100 San Diego, CA 92123-4340

or visit www.dtsc.ca.gov

What do I need to do to dispose of my appliance?



**** Except local governments delivering major appliances to scrap recycling facilities***

[1] Major Appliances are include but are not limited to washers, dryers, refrigerators, freezers, space heaters, microwaves, ovens, stoves, boilers, furnaces, water heaters, air conditioners, and trash compactors (Public Resource Code 42166)

[2] As of January 1, 2006, any major appliance must be accompanied by DTSC Form 1430 upon delivery to a scrap recycling facility. Form 1430 is a written certification that a CAR properly removed and managed Materials that Require Special Handling. A record of these forms must be kept by the CAR for 3 years and be made available for inspection by DTSC or a local CUPA officer (Health and Safety Code 25211.2(a)

[3] "Processed" includes crushed, baled, shredded, sawed or sheared apart

[4] MRSH: Materials that Require Special Handling. A list of MRSH can be found at: http://www.dtsc.ca.gov/HazardousWaste/Mercury/Certified_Appliance_Recycler.cfm

[5] As of January 1, 2008 DTSC Form 1459 must be filled out by the person who transports, delivers, or sells the appliance to the scrap facility (Health and Safety Code 25211.2 (b)2(B)). This form must be kept by the CAR and the person disposing of the appliance for 3 years, and be made available for inspection by DTSC or a local CUPA officer (Health and Safety Code 25211.2(d)). The scrap recycling facility must also submit a monthly report (see http://www.dtsc.ca.gov/HazardousWaste/Mercury/Certified_Appliance_Recycler.cfm for form) to DTSC and the local CUPA containing the following information (Health and Safety Code 25211.3):

- The name and address of the person who transported, delivered, or sold the appliance to the scrap recycling facility
- The total number of "orphan" appliances received.

[6] Scrap recycling facilities include but are not limited to a feeder yard, a metal shredding facility, a metal crusher, and a metal bailer (Health and Safety Code 25211)

[7] MRSH from major appliances must be removed and properly managed prior to being crushed, baled, shredded, sawed or sheared apart (Health and Safety Code 25212)

[8] This record must include the following (Health and Safety Code 25211.3(a)):

- The amount, by volume or weight or both of each material that requires special handling
- The method used by the appliance recycler to recycle, dispose of, or otherwise manage each material that requires special handling, including the name and address of the facility to which each material was sent
- The number and types of appliances from which materials that require special handling are removed each year
- The reports required pursuant to Health and Safety Code 25211.2(c)

APPENDIX B SURVEY PHOTOGRAPHS

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 1: Area A1 - Maintenance Building Heater (Possible Mercury-containing Thermostat)

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 2: A1 Maintenance Building



Photo 3: A1 Electrical Devices in Maintenance Building

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 4: A1 – Flammable Storage Cabinet in Maintenance Building



Photo 5: Area A1 – Contents Inside Flammable Storage Cabinet in Maintenance Building

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 6: A1 – Heat Exchange Building Universal Waste/Recycling Area



Photo 7: A1 - Recycling Area outside Maintenance Building (Drum Contains Universal Waste)

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 8: A1 – Cogeneration System



Photo 9: A2 – Diesel Generator

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 10: A2 – Diesel Fuel AST for Generator

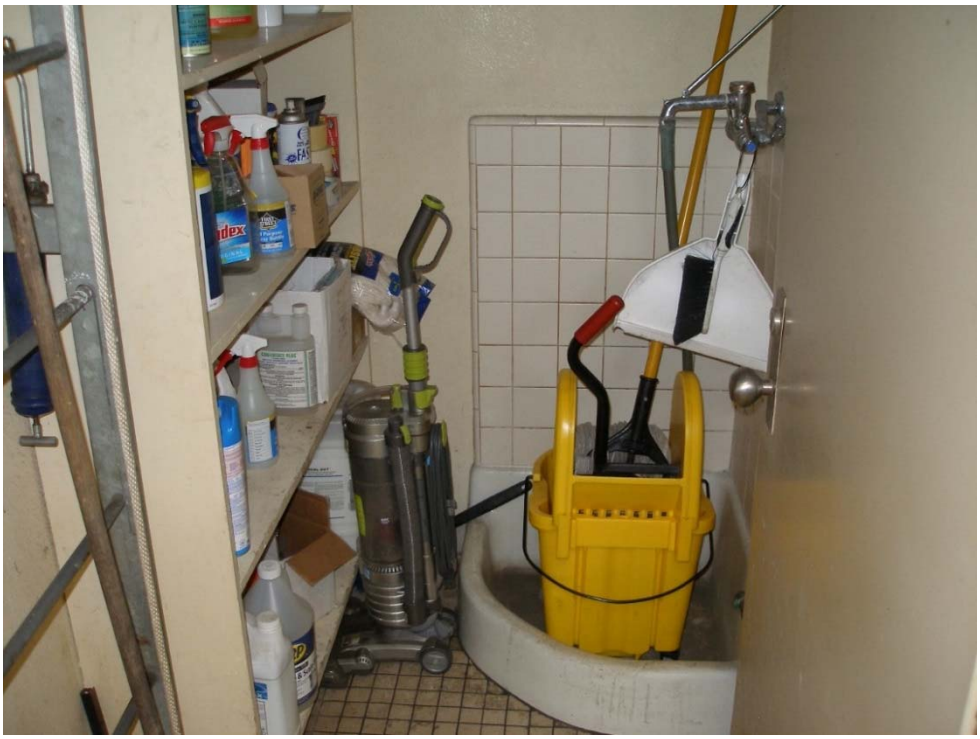


Photo 11: A2 – Janitor Closet in Administration Building

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 12: A2 – Electrical Transformer and Storage Outside of Administration/Control Building



Photo 11: B2 – SDG&E Electrical Transformer

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 12: C1 – Coated Utility Pole Wall



Photo 13: C1 – Storage Containers

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PHOTOGRAPHIC DOCUMENTATION



Photo 14: C2 – H_2O_2 Storage Tank



Photo 15: D1 – Hypochlorite Storage Tank

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 16: E3 – Headworks Emergency Generator Diesel Fuel AST



Photo 17: F1 – Seatainer Contents

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PHOTOGRAPHIC DOCUMENTATION



Photo 18: F3 – Headworks - Spare Bulbs Containing Mercury



Photo 19: F3 – South Pacific Pump Station Backup Generator and Diesel AST

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photo 20: G2 – LSWWTP Outfall Pump Station Backup Generator and Diesel ASTs

APPENDIX C FIELD SURVEY DETAILS

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

Date: 11/16 - 20/2015 By: Eric Peirce & Bill Sedlak

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
A1	Boiler Room	Tubes of Silicon caulking			X			Yes	
A1	Boiler Room	Universal waste pending disposal					X		Must be disposed offsite prior to shutdown
A1	DAF	Sodium hypochlorite			X				1,100 gal. poly tank
A1	DAF	Aerosol cans			X (Note 4)		X (Note 4)		Loose spray cans
A1	DAF	buckets of oil - #2@ 5 gal ea			X				Exterior of DAF by pumps east of bldg
A1	DAF	Praestol R133H Flocculant 2,300 lb poly tank			X			Yes	
A1	DAF	High intensity lights					X		Combination of LED and sodium vapor; 1 located inside, 2 outside
A1	DAF/ Flammable Cabinet	5-gal containers of oil (some 22.7 liter) approx #30			X			Yes	Flammable Cabinet
A1	DAF/ Flammable Cabinet	Quarts of oil, gear oil			X			Yes	Flammable Cabinet
A1	Maintenance Building	Soap & disinfectants			X				Safety locker
A1	Maintenance Building	Honeywell thermostat- For heater, gas heater				X?	X		On wall by man door; 2 natural gas space heaters
A1	Maintenance Building	Space heaters, natural gas heaters			X (MRSH)	X?			Appliance, from ceiling 2 natural gas space heaters

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

Date: 11/16 - 20/2015 By: Eric Peirce & Bill Sedlak

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
A1	Maintenance Building	Flammables Cabinet - solvents, cleaners - spray can			X (Note 4)		X (Note 4)		also some PVC solvent/glue
A1	Maintenance Building	Insecticide - ant killer			X				
A1	Maintenance Building	Hand soap, cleaners			X				
A1	Maintenance Building	Electric space heater			X (MRSH)			Yes	portable
A1	Maintenance Building	Oxy-acetylene torch w/ gas cylinders			X (if pressurized)			Yes	
A1	Maintenance Building	Wax, cleaners; car wash cleaner			X				Outside building, By air compressor and sink on east side
A1	Maintenance Building	Grease cartridges, oil and lubricants			X				Interior cabinets
A1	Maintenance Building	Paints			X (Note 4)		X (Note 4)		Spray cans, interior cabinet
A1	Maintenance Building	Aerosol cans of Solvents and cleaners			X (Note 4)		X (Note 4)		Spray cans, containers, interior cabinet
A1	Maintenance Building	Refrigerator (mini)			X (MRSH)			Yes	Freon must be removed prior to disposal of refrigerator as waste
A1	Maintenance Building	Roof adhesive and cement, in gallon cans and 5 gal. buckets			X				
A1	Maintenance Building	Honda Generator EU 6500 LS			X (ignitable)			Yes	gasoline fuel, oil must be drained before disposal
A1	Maintenance Building	Epoxy, Loctite, lubricants, degreasers			X				On workbench

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

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AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
A1	Maintenance Building	Battery chargers					X	Yes	tools and radios
A1	Maintenance Building	Battery charger - 12 volt					X	Yes	automotive
A1	Maintenance Building	Misc - power outlets - power strips					X	Yes	
A1	Maintenance Building	Fluorescent lights/fixtures (#14) (8 are extended)					X		
A1	Maintenance Building	Computer equipment (LCD monitor, general computer equipment, printers)					X	Yes	
A1	Maintenance Building	Silicon tubes, grease guns						Yes	
A1	Maintenance Building	Air compressor (white) (machine shelf)						Yes	State serial No. A011292-08 N.B. #/SER, #60592 (Oil must be drained prior to disposal)
A1	Maintenance Building	Air compressor (green)						Yes	No permit visible, Oil must be drained prior to disposal
A2	Admin Building	Fluorescent lights & fixtures - #7 x 4' fixtures, 2 and 4 light fixtures		X			X		Possible PCB - In Laboratory area not replaced
A2	Admin Building	Fluorescent lights/fixtures (#29) inside					X		Replaced per Electrician, except Laboratory area
A2	Admin Building	Refrigerator - lab samples			X (MRSH)				
A2	Admin Building	Floor wax 5 quart and 5 gal			X				Water Heater room
A2	Admin Building	HVAC unit on roof - R410 refrigerant gas			X (MRSH)				Freon gas removal required for waste disposal

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

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AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
A2	Admin Building	Aerosol cans, paint, air freshener, solvents, degreasers, cleaners			X (Note 4)		X (Note 4)		Back storage room
A2	Admin Building	Cleaners, bleach, soap, (liquid) hand sanitizer			X				Back storage room
A2	Admin Building	Air spray, lubricants, cleaners (aerosols)/liquid cleaners			X (Note 4)		X (Note 4)		Janitorial closet
A2	Admin Building	Small calibration gas cylinders, oxygen, nitrogen - Compressed gas			X (if pressurized)			Yes	
A2	Admin Building	Washer and dryer			X (MRSH)			Yes	appliances
A2	Admin Building	Eye wash station			X				In Laboratory area
A2	Admin Building	Propane cylinders - #4 x 1 lb			X (if pressurized)				In Laboratory area; non-hazardous if propane used or cylinders empty
A2	Admin Building	Chemicals - various for testing water quality, etc.			X				In Laboratory area
A2	Admin Building	Pump solvent for airless sprayer - #3, quarts			X				In Laboratory area
A2	Admin Building	Pesticides, cleaners			X				Janitor closet
A2	Admin Building	Microwave			X (MRSH)			Yes	Control/Lunch room
A2	Admin Building	Refrigerator			X (MRSH)			Yes	Control/Lunch room
A2	Admin Building	Thermostat - wall mounted				X?	X		Control/Lunch room

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

Date: 11/16 - 20/2015 By: Eric Peirce & Bill Sedlak

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
A2	Admin Building	General electronic waste, Computers, printers, monitors, etc.					X	Yes	
A2	Admin Building	Computer server system					X	Yes	In Laboratory area
A2	Admin Building	Area lights					X		Seven outside, sodium vapor lamps
A2	Admin Building	Printer, DVR, TV, clock					X	Yes	In Laboratory area
A2	Admin Building	2-way Radios - w/chargers					X	Yes	In Laboratory area
A2	Admin Building	Recharging station - Ni-cad batteries					X		In Laboratory area
A2	Admin Building	Weather station					X	Yes	In Laboratory area/outside
A2	Admin Building	computers, printers, monitors (#3)					X	Yes	Front office
A2	Admin Building	Emergency lights, Hand held					X	Yes	Front office
A2	Admin Building	Defibrillator					X	Yes	Hallway
A2	Admin Building	Computers w/ monitors - (#2) monitor - (#1)					X	Yes	Control/Lunch room
A2	Admin Building	Emergency hand held lights					X		Control/Lunch room
A2	West of Admin	GE Transformer dry, 9T23B3876						Yes	Dry transformer, not hazardous, no PCB

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS Date: 11/16 - 20/2015 By: Eric Peirce & Bill Sedlak

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
A2	West of Admin	Transformer D3718965729 1676						Yes	not applicable - SDG&E Property
B1	Secondary Digester	Hydrogen peroxide tanks (2)			X				Peroxide must be removed and tanks washed,1,000 gal metal tank (2)
B1	Secondary Digester	Praestol R133h Flocculant			X			Yes	250 gal poly tote
B1	Secondary Digester	Microwave tower & electronics					X	Yes	might salvage electronics
B1	Secondary Digester	CHP Cogeneration unit						Yes	Cogen unit - by others - assume salvage or removed
B2	Blower Bldg	Thermal control for blower				X			may contain mercury
C1	Containers South of Maint Bldg	Used aerosol cans (10-20)			X (Note 4)		X (Note 4)		in Deodorant container
C1	Containers South of Maint Bldg	Accu-TAB calcium hypochlorite tabs, 55 lb bucket	Oxidizer/ Corrosive Acid		X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Compressed Gas Cylinders: oxygen (1 full), helium & Argon (1 full)			X (if pressurized)			Yes	In Compressed Gas Cylinder locker
C1	Containers South of Maint Bldg	Sodium hypochlorite 55-gal poly drum (#1)	Corrosive		X			Yes	in Sodium hypochlorite container
C1	Containers South of Maint Bldg	ACCU-TAB calcium hypochlorite tabs; 55 lb bucket	Oxidizer/ Corrosive		X			Yes	in Sodium hypochlorite container
C1	Containers South of Maint Bldg	sodium hypochlorite poly drums 4 x 55-gal	Oxidizer/ Corrosive		X			Yes	in Sodium hypochlorite container

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

Date: 11/16 - 20/2015 By: Eric Peirce & Bill Sedlak

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
C1	Containers South of Maint Bldg	Muriatic acid (#12) boxes of #4 1-gal bottles + #2 5-gal poly	Acid		X			Yes	in Muriatic acid container
C1	Containers South of Maint Bldg	Eucalyptus concentrate - (#7) gal			X (ignitable)			Yes	Flammable - alcohol
C1	Containers South of Maint Bldg	Elimin-odor/ lemon - (#11) gal			X (ignitable)			Yes	Flammable - Ethanol
C1	Containers South of Maint Bldg	Chem search 777 - corrosion preventer #2 x 2-1/2 gal			X			Yes	
C1	Containers South of Maint Bldg	CIP cleaner - 5 gal. Sodium thiosulfate crystals - #10 x 50 lb			X			Yes	
C1	Containers South of Maint Bldg	Green sweeping compound (#2) (100 lb)			X			Yes	Spill equipment container
C1	Containers South of Maint Bldg	Sodium thiosulfate (#10) (50 lb)			X			Yes	in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Tornado Acid CIP cleaner (5 gal bucket)	Acid		X			Yes	in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Frazes traffic paint (1 can) (1 gal)			X				in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Neutralizer absorbant	Base		X			Yes	in Sodium thiosulfate container
C1	Containers South of Maint Bldg	Eucalyptus odorant concentrate (#2) gallon bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Elim-odor (#11) gallon bottles			X			Yes	in Deodorant container

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

Date: 11/16 - 20/2015 By: Eric Peirce & Bill Sedlak

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
C1	Containers South of Maint Bldg	Zep cleaner, cherry odor (#8) gallon bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	State cleaner, apple odor, (#12) morning fresh odor (#1) gallons			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Zep cleaner, DEO-1 Or DEO-3 (#3) gallons, bottles			X			Yes	in Deodorant container
C1	Containers South of Maint Bldg	Unifresh, cherry odor (#1) gallon, plastic bottles			X			Yes	in Deodorant container
C1	Maintenance Building	Brake cleaner, Loctite adhesive cement			X				
C1	Maintenance Building	Patch & bond for metals, concrete, other			X				
C1	Maintenance Building	Parts washer - Armakleen cleaner solution			X			Yes	Parts cleaner and drum of cleaner solution
C1	Maintenance Building	Propane tank - 10 gal			X (if pressurized)			Yes	
C1	Maintenance Building	Cleaners (liquid soap)			X				
C1	Maintenance Building	PVC glue cans			X				
C1	Maintenance Building	Compressed gas cylinders (oxy-acetylene/Heli arc welding)			X (if pressurized)			Yes	Deposit on cylinders, 100CF oxygen, helium/argon
C1	Maintenance Building	Solvents (Derma Kleen 4JN Cleaning solution)			X				
C1	Maintenance Building	Rechargeable radios/charger					X	Yes	
C1	Maintenance Building	Batteries - rechargeable					X	Yes	

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

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AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
C1	Maintenance Building	Fluorescent lights/fixtures (double) (#6)					X		
C1	Maintenance Building	Radio/stereo & speakers					X	Yes	
C1	Maintenance Building	Battery charger (power tool batteries)					X	Yes	
C1	Maintenance Building	Small portable air compressor						Yes	6 gal, 150 psi
C1	North of Abandoned Primary digester	55 gal oil drums partially full #2			X				Waste Storage along Access Road, Inside secondary containment
C1	North of Abandoned Primary digester	Used oil storage - #1 - 55 gal. #4 - 25-30 gal			X				Waste Storage along Access Road, Inside secondary containment
C1	North of Maint. Bldg.	Air compressor, Serial # A010956-13						Yes	
C1	South of Maint Building	Coated pieces of utility poles for landscape/retaining wall			X				Approx 15 short poles coated with tar/creosote
C1	South of Maint Building	Propane tank ~10 gallon			X (if pressurized)			Yes	Non-hazardous if empty/depressurized
C2	Grit Chamber	Hydrogen peroxide solution 50% w/w 3,000 gal poly tank	Oxidizer/ Corrosive (acid)		X				~1,750 Gal in Tank
C2	Grit Chamber	Ferric chloride 275 gal poly (one full one empty)	Oxidizer/ Corrosive (acid)		X				Poly tote over secondary containment, 2/3 full; Salvage Deposit on tote
C2	Old pump station	Fluorescent lights/fixtures, 6 double fixtures		X?			X		Possible PCB - Unknown if replaced

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS Date: 11/16 - 20/2015 By: Eric Peirce & Bill Sedlak

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
C2	Old pump station	Outdoor light (yellow)					X		sodium vapor lights
C2	Reclaimed water pump station	Air compressor, green, upright tank						Yes	No permit, Oil must be drained prior to disposal
C2	South of N. Sec. Clarifier	Hydrogen peroxide tanks "Empty, Not in use" label on tank			X				May need to be cleaned and documented
D1	In between digesters	Outdoor light					X		Sodium vapor lamp
D1	La Salina WWTP air blower bld.	Oil drips, absorbent pads (used) oil			X				Under blowers to catch leaks
D1	La Salina WWTP air blower bld.	Outdoor light (3) (yellow)					X		Sodium vapor lamp
D1	La Salina WWTP air blower bld.	Fluorescent lights/fixtures, 4 double fixtures					X		
D1	Sodium Hypochlorite Storage Area	4,100 gal poly tank sodium hypochlorite			X				Large poly in containment area
D1	Sodium Hypochlorite Storage Area	Lubricant aerosol can			X (Note 4)		X (Note 4)		Lubricant spray can
D1	South of secondary digester	Praestol 186k polymer			X				55 gal poly, Mat #656870
D1	South of secondary digester	ZETAG 8816 (US) (BASF)			X (ignitable)				55 gal poly, Mat #56462479
D1	South of secondary digester	Polydyne (written on drum) C-6288			X				55 gal poly, acrylamide emulsion, slight health hazard Mat Lot # RC19/3069

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS Date: 11/16 - 20/2015 By: Eric Peirce & Bill Sedlak

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
D1	South of secondary digester	Praestol A 3050 L Flocculant			X				55 gal poly, Mat #656753
D1	Waste gas burner	(2) 10 gal propane tank			X (if pressurized)			Yes	Connected to burner - pilot gas
E1	North of Sludge Bldg	Praestol A 3050 L Flocculant			X				250 gal poly tote, Mat #674985
E1	Sludge Drying Building	empty poly drums (#4)			X (if not washed)				55 gal, unlabeled; May need to be cleaned and documented
E1	Sludge Drying Building	Aerosol cans of Lubricants and oils and cleaners			X (Note 4)		X (Note 4)		
E1	Sludge Drying Building	LA chemchlor, Sodium hypochlorite 12.5% solution	X		X				for scrubber
E1	Sludge Drying Building	Empty deodorant poly			X (if not washed)				May need to be cleaned and documented
E1	Sludge Drying Building	Plastic aerator packing material			X (if not washed)				In sodium hypochlorite solution
E1	Sludge Drying Building	Yellow flammable cabinet			X				Blocked, unknown inside
E1	Sludge Drying Building	(7) outside lights				X			Sodium vapor lights
E1	Sludge Drying Building	Fluorescent lights/fixtures (#6)					X		Inside power control room
E1	Sludge Drying Building	Fluorescent lights/fixtures lights (#22)					X		Upstairs

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

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AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
E1	Sludge Drying Building	emergency lights (#2)					X		1 in power control, 1 upstairs
E1	Sludge Drying Building	Fluorescent lights/fixtures (#13)					X		Downstairs
E1	Sodium Hypochlorite Storage Room	Praestol A 3050 L Flocculant			X				55 gal poly, Mat #657337
E1	Sodium Hypochlorite Storage Room	Praestol A 3050 L Flocculant			X				(4) 250 gal poly totes, Mat #674985
E3	Headworks	outside building lights (#6)				X			Yellow/sodium vapor building lights
E3	Headworks	Diesel fuel pump			X (if not drained, washed)				Upstairs
E3	Headworks	Spray cans and cleaners			X (Note 4)		X (Note 4)		Upstairs
E3	Headworks	Fluorescent lights/fixtures (#23)					X		Upstairs
E3	Headworks	Fluorescent lights/fixtures (#16)					X		Upstairs
E3	Headworks	Fluorescent lights/fixtures, double (#8)					X		Upstairs
E3	Headworks bathroom	Aerosol cans, Cleaners & air fresheners			X (Note 4)		X (Note 4)		
E3	Headworks bathroom	Cleaners and soap (Cleaners & air fresheners)			X				Hand soap and sanitizer, bleach
E3	Headworks bathroom	Fluorescent lights/fixtures (#1)					X		Installed
E3	Headworks control room	Outside light bulb spare bulb (approx. #12)				X		Yes	sodium vapor lights
E3	Headworks control room	Box of 40 watt tubes				X?	X	Yes	Box of 40 watt tubes

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS Date: 11/16 - 20/2015 By: Eric Peirce & Bill Sedlak

AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
E3	Headworks control room	Pint can of PVC glue (#1)			X				
E3	Headworks control room	Fluorescent lights/fixtures (#7)					X		Installed
E3	Headworks control room	Fluorescent lights/fixtures (#2)					X		Not installed
E3	Headworks control room	boxes spare Fluorescent lights (#2)					X		Spare bulb
E3	Inside Storage seatainer	Fluorescent lights/fixtures (#27)					X		Upstairs
E3	North of headworks	Diesel Fuel in 1,000 gal AST			X				AST - double contained
F1	Inside Storage seatainer	Fluorescent lights/fixtures (3)		X?			X		Interior lights Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (#3)		X?			X		Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (#4)		X?			X		Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Fluorescent lights/fixtures (#4)		X?			X		Possible PCB – unclear if replaced
F1	Inside Storage seatainer	Paint cans (1 gal)			X				Approx 47 cans
F1	Inside Storage seatainer	Paint bucket (4 gal)			X				Approx 3
F1	Inside Storage seatainer	Spray cans (aerosol)			X (Note 4)		X (Note 4)		Approx 20 aerosol cans

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AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
F1	Inside Storage seatainer	Bug Stop (1.33 gal) (#2)			X				
F1	Inside Storage seatainer	Paint buckets (~4 gal)			X				Approx 4
F1	Inside Storage seatainer	Plant food, Miracle Gro			X				
F1	Inside Storage seatainer	Wood stain			X				
F1	Inside Storage seatainer	Spray cans, paint thinner & lubricants			X (Note 4)		X (Note 4)		Approx 45 cans
F1	Inside Storage seatainer	Paint cans (1 gal)			X				Approx 30 cans
F1	Inside Storage seatainer	1 gal container acid	X		X				Unmarked, only corrosive label
F1	Inside Storage seatainer	1 container 2.2 gal, solvents			X				Mineral spirits solvent
F1	Inside Storage seatainer	5-gal Bucket all weather roof cement			X				
F1	Inside Storage seatainer	Gas cans, approx #15			X (if not drained, washed)				1-5 gal sizes, if contain gasoline it must be disposed separately
F1	Inside Storage seatainer	Aerosol cans			X (Note 4)		X (Note 4)		Approx 25

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

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AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)					Potential Salvage Item? (Note 3)	NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste		
F3	Headworks	Fluorescent lights/fixtures (#2)		X?			X		Stairwell - Possible PCB – unclear if replaced
F3	Headworks	Fluorescent lights/fixtures (#14)		X?			X		Downstairs - Possible PCB – unclear if replaced
F3	Headworks	outside lights (sodium vapor) (#8)				X			
F3	Headworks	Oil leaks and Absorbent Pads			X				Around equipment
F3	Headworks	Green air compressor						Yes	State serial #A010955-13 (Oil must be drained prior to disposal) NIB#/SER#l979124 On wheels
F3	Headworks	Green air compressor						Yes	State serial #A055606-08 (Oil must be drained prior to disposal) NIB#/SER#L1206004 Upright
F3	So Pacific Pump Station	200 Gal diesel fuel AST for generator			X (if not drained, washed)			Yes	Diesel fuel must be removed from AST
F3	So Pacific Pump Station	Fluorescent lights/fixtures (#2)					X		Hatch interior
F3	South of Headworks	Deodorant drum			X				55 gal. poly May need to be cleaned and documented
F3	South of Headworks	2,800 gal sodium hypochlorite poly	Oxidizer/ corrosive		X				May need to be cleaned and documented
G2	Outfall Pump Station	Fluorescent lights/fixtures (#17)		X?			X		Stairwell & downstairs - Possible PCB – unclear if replaced
G2	Outfall Pump Station	Aerosol can Lubricant/solvent			X (Note 4)		X (Note 4)		
G2/3	Outfall Pump Station	Diesel Fuel ASTs 300 gal and 500 gal for generator			X			Yes	Diesel fuel must be removed from AST
Site wide	Site wide	Fire Extinguishers			X			Yes	Dry chemical Fire extinguishers need to be classified based on type of dry chemical used in each extinguisher. May be hazardous
Site wide	Site wide	outdoor lights on posts (approx #76)				X	X		Single, double, and triple light posts sodium vapor lamps

LA SALINA WWTP PRE-DEMOLITION SURVEY DETAILS

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AREA (A1 etc.) (Note 1)	VICINITY	DESCRIPTION	POTENTIAL CLASSIFICATIONS (Note 2)						NOTES
			Corrosivity Acid/Base	PCB-Containing	Hazardous/ Toxic Waste	Mercury-Containing	Universal Waste	Potential Salvage Item? (Note 3)	

Notes:

1. Area Designations (i.e., A1 to G2) are shown on Figure 1
2. Classifications are based on the observed material(s) and likely designation of the materials if they required disposal. Actual classifications may vary from potential classifications based on detailed reviews of the chemical properties and Safety Data Sheet classifications at the time of disposal.
3. Items identified as being "potentially salvageable" are based on the nature of the item, and anticipated suitability for reuse at another City Facility and/or other agency.
4. X (Note 4) Universal Waste if disposed prior to Plant shut down; Hazardous if disposed after shut down.
5. (#3) – Estimated quantity of the item, based on observations
6. X? – Category may apply if PCBs/mercury is present

La Salina Lift Station and Treatment Plant Decommissioning

Appendix M. Geotechnical Report

GEOTECHNICAL EXPLORATION REPORT
LA SALINA SEWER LIFT STATION DESIGN AND WASTEWATER TREATMENT PLANT DECOMISSIONING PROJECT
1330 SOUTH TAIT STREET
CITY OF OCEANSIDE, CALIFORNIA

Prepared for:

TETRA TECH, INC.

17885 Von Karman Avenue, Suite 500
Irvine, California 92614

Project No. 11224.001

May 25, 2016

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

May 25, 2016

Project No. 11224.001

Tetra Tech, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, California 92614

Attention: Mr. Steve Ellis, PE

Subject: Geotechnical Exploration Report
La Salina Sewer Lift Station Design and
Wastewater Treatment Plant Decomissioning
1330 South Tait Street
City of Oceanside, California

In accordance with your request, Leighton Consulting, Inc. has prepared this geotechnical exploration report for the proposed La Salina Sewer Lift Station and Wastewater Treatment Plant Decommissioning project in the city of Oceanside, California.

Geotechnical aspects of the site that should be considered in design and construction include potential for strong seismic shaking, shallow groundwater, static and seismic settlement, and presence of non-uniform materials below the proposed lift station and underground tanks.

Based on our borings and CPTs, the proposed lift station and underground tanks are expected to be underlain by Quaternary-aged younger alluvium and older alluvium or weathered bedrock of the Santiago Formation. The northern portion of the plant to be decommissioned for future development is underlain by artificial fill and younger alluvium.

Groundwater was encountered at the lift station and tank site during our field exploration at depths of 7 to 8 feet, corresponding to approximately elevation 5 feet above the mean sea level. Groundwater was not encountered in the borings drilled to a maximum depth of 11.5 feet at the northern portion of the site that is located at a higher elevation.

17781 Cowan ▪ Irvine, CA 92614-6009
949.250.1421 ▪ 949.250.1114 Fax

The use of mat foundation system is considered feasible for support of the proposed lift station and tanks provided that the potential for differential settlement is accounted for in the structural design. To reduce the potential for adverse differential settlement and to provide uniform support, we recommend that the mat foundation system be underlain by a minimum of 3 feet of crushed aggregate. Soils with high moisture content are expected to be encountered during construction excavation. The soils will require special grading techniques such as air drying or mixing with drier soils prior to placement as compacted fill and the excavation bottom may require stabilization prior to fill placement. Alternatively, the lift station and tanks can be supported on a deep foundation system that extends through the younger alluvium into competent material.

The proposed project is feasible from a geotechnical standpoint, provided the findings and recommendations presented in this report are incorporated into the design and construction. This report presents the results of our field exploration, laboratory testing, and geotechnical analyses, and provides our recommendations for the proposed project.

We appreciate the opportunity to work with you on this project. If you have any questions, or if we can be of further service, please contact us at your convenience.



Respectfully submitted,

LEIGHTON CONSULTING, INC.

Djan Chandra, PE, GE 2376
Senior Principal Engineer

SP/DJC/lr

Distribution: (1) Addressee

Leighton

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1.0 INTRODUCTION

1.1 Site Location

The La Salina Wastewater Treatment Plant is located at 1330 South Tait Street in the city of Oceanside, California. Approximate location of the project site is shown on Figure 1, *Geotechnical Map*. The site is bound by Croswaithe Street to the north, Loma Alta Marsh to the south, railway tracks to the east and Tait Street, Pacific Street and an existing residential development to the west. Topography at the site generally slopes down towards the south with elevations ranging from approximately 34 to 13 feet above mean sea level (msl). Generally, the northern portion of the plant is currently occupied by two administrative buildings and several above-grade and below-grade wastewater treatment tanks. The southern portion is currently occupied by several above-grade equipment buildings and the associated paved driveways, parking and storage areas.

1.2 Proposed Project

The existing plant will be decommissioned and replaced with a new sewer lift station, a load equalization tank, and an emergency storage tank to move wastewater from the plant collection area to the San Luis Rey Water Reclamation Facility. The new lift station and tanks will be located at the southern portion of the site where the existing site elevation is at approximately 13 feet msl. These structures will be approximately 28 to 30 feet deep and include a lift station building to house dry pump room, wet wells, restroom, chemical feed room, emergency generator room, and electrical control and telemetry room. The remaining areas of the existing plant will be demolished and graded for future development that includes 4.2 acres of residential site in the northern half and 4.9 acres of park in the southern half.

1.3 Purpose and Scope of Exploration

The purpose of our geotechnical exploration was to evaluate the subsurface conditions and general soil characteristics at the project site in order to provide geotechnical parameters for design and construction of the proposed project. The scope of this exploration included the following tasks:

- *Background Review* – In preparation of this report, we performed a background review of readily available, relevant, geotechnical and geological

literature pertinent to the site. References used in preparation of this report are listed in Section 7.0.

- *Pre-Field Exploration Activities* – A site visit was performed to meet with a representative of the City of Oceanside to mark the proposed boring and CPT locations, evaluate site access for drilling equipment, and identify potential utility conflict at the proposed boring/CPT locations. Underground Service Alert (USA) was notified to locate and mark existing underground utilities prior to our subsurface exploration. After reviewing the site utility plans and discussions with City personnel during our site visit, a private utility locator was subcontracted by Leighton to clear utilities at our proposed boring/CPT locations.

- *Field Exploration* – On April 8, 2016, we drilled two hollow-stem auger borings (LB-1 and LB-8) to a maximum depth of 51½ feet below existing ground surface in the southern portion of the site by the proposed lift station and underground tank locations. We also drilled six hollow-stem auger borings (LB-2 through LB-7) to a maximum depth of 11½ feet in the northern portion of the site. Soils encountered in the borings were continuously logged in the field by a Leighton representative and described in accordance with the Unified Soil Classification System (ASTM D 2488). During drilling, bulk and relatively undisturbed drive samples were obtained from the borings for evaluation and subsequent geotechnical laboratory testing. The relatively undisturbed samples were obtained utilizing a modified California Ring sampler. Standard Penetration Tests (SPTs) were also performed at selected depths. The SPT and Ring samplers were driven into the soil with a 140-pound hammer, free falling 30 inches, following the sampling procedures in ASTM D 1586 and D 3550. The number of blow counts per 6 inches of penetration was recorded on the boring logs. Ground surface elevations at the test boring locations as indicated on the boring logs were interpolated from topographic data shown on the site plan provided for our use. After completion of sampling and logging, all borings were backfilled with soil cuttings and patched with cold mix asphalt where penetrated.

  We also advanced two Cone Penetrations Tests (CPTs) for the proposed lift station and underground tanks on April 8, 2016. Our first attempt to advance the CPTs at the two locations encountered refusal at a depth of 9 feet and 3 feet. Both CPT locations were moved a few feet and advanced to 30 feet and 76 feet. The CPTs were performed in accordance with ASTM D 5778 by

pushing a standard 10 cm^2, instrumented electric cone into the ground while simultaneously recording the tip resistance and side friction of the soils during penetration. After completion of the testing, the holes were backfilled with bentonite and patched with cold mix asphalt where penetrated.

Logs of the borings are presented in Appendix A, *Geotechnical Boring Logs*, and CPT logs are presented in Appendix B, *CPT Logs*. The approximate locations of our borings and CPTs are shown on Figure 1, *Geotechnical Map*.

- *Laboratory Tests* – Laboratory tests were performed on selected soil samples obtained during our field investigation. The laboratory testing program was designed to evaluate the physical and engineering characteristics of the onsite subsurface soils. Tests performed during this investigation include:

  - Moisture content and dry density (ASTM D 2216 and ASTM D 2937);
  - Percent passing No. 200 sieve (ASTM D 1140);
  - Atterberg Limits (ASTM D 4318);
  - Direct shear (ASTM D 3080); and
  - Corrosivity suite – pH, Sulfate, Chloride, and Resistivity (California Test Methods 417, 422, and 532/643).

  Results of moisture content and dry density testing are presented on the boring logs in Appendix A. Other laboratory test results are presented in Appendix C.

- *Engineering Analysis* - The data obtained from our background review, field exploration, and laboratory testing program were evaluated and analyzed to develop geotechnical recommendations for the proposed project.

- *Report Preparation* – This report summarizes the results of our exploration and presents geotechnical recommendations for the proposed project.

2.0 GEOTECHNICAL FINDINGS

2.1 Geologic Setting

The site is located in the coastal region of the Peninsular Ranges Geomorphic Province in Southern California. The Peninsular Ranges province extends 900 miles southward from the Los Angeles basin to the tip of Baja California (Yerkes, et al., 1965) and is characterized by elongated, northwest-trending, mountain ridges separated by straight-sided, sediment-floored valleys. The most dominant structural features of the province are the northwest-trending fault zones, most of which either die out, merge with, or are terminated by the steep reverse faults at the southern margin of the Transverse Ranges province. These fault zones separate large elongated blocks, each standing at different structural elevations. The site is located in an area known as “San Diego Embayment” that has undergone several episodes of marine inundation and subsequent marine regression throughout the last 54 million years, resulting in the deposition of a thick sequence of marine and nonmarine sedimentary rocks on the basement rock of the Southern California batholith. Gradual emergence of the region from the sea occurred in Pleistocene time and numerous wave-cut platforms, most of which were covered by relatively thin marine and nonmarine terrace deposits, formed as the sea receded from the land. Accelerated fluvial erosion during periods of heavy rainfall, coupled with the lowering of the base sea level during Quaternary times, resulted in the rolling hills, mesas, and deeply incised canyons which characterize the landforms we see in the general site area today.

The surficial geologic units mapped at the site are younger alluvial valley deposits located primarily in the southern portion of the site and older paralic deposits in the northern portion of the site (see Figure 2, *Regional Geology Map*). Local exposures of bedrock are mapped to the south of the project site on the southern flank of Loma Alta March, and consist of middle Eocene age marine sedimentary rocks of the Santiago Formation (Kennedy et al., 2007; Tan and Kennedy, 1996).

2.2 Subsurface Soil Conditions

The subsurface conditions subsequently described in this section of the report have been summarized for ease of interpretation. Detailed descriptions of the materials encountered in the borings and CPT’s and the approximate stratigraphy are presented on the boring and CPT logs in Appendix A and Appendix B, respectively.

Our generalized interpretation of the subsurface profile at the lift station and tank location is shown on Figure 3, *Cross Section A-A'*. Pavement section consisted of 1 inch of asphalt concrete over 4 inches of aggregate base was penetrated at Boring LB-1. Boring LB-8 is located in an unpaved area. Artificial fill (Af) consisting mainly of silty and clayey sand with gravel was encountered to a depth of 5 to 10 feet. Below the artificial fill, Quaternary-aged younger alluvium (Qa) was encountered to a depth of approximately 66 feet at the lift station site and 22 feet at the west end of the underground tanks. The younger alluvium generally consisted of medium stiff to very stiff, medium to high plasticity clay with interbedded sand, silty sand and sandy silt layers. The younger alluvium is underlain by dense to very dense older alluvium (Qol) and bedrock of the Santiago Formation (Tsa). The depths and geologic units at the boring and CPT locations are summarized in Table 1. It should be noted that CPT-2 located adjacent to Boring LB-8 encountered refusal at approximately 30 feet.

Table 1 – Subsurface Geology at Lift Station and Tank Site

Boring/ CPT No.	Location	Artificial Fill (Af)	Younger Alluvium (Qa)	Older Alluvium (Qol)/ Weathered Bedrock	Bedrock (Tsa)
LB-1/ CPT-1	Lift Station	0' – 10'	10' – 66'	-	66' – 75'
LB-8/ CPT-2	West of Tanks	0' – 5'	5' – 22'	22' – 35'	35' – 52'

The lift station and underground tanks at 28 to 30 feet below grade are expected to be underlain by two geologic materials (Qa and Qol/Tsa) with different characteristics in term of compressibility and strength. The recommendations presented in Section 3.0 were developed taking into consideration variability of the supporting soils.

Borings LB-2 through LB-7 were drilled at the northern portion of the site that will be developed for housing and park. Asphalt concrete pavement sections were penetrated at the borings drilled within the driveway and parking areas of the plant. The pavement sections generally consisted of 3 to 12 inches of asphalt concrete over 3 to 6 inches of aggregate base course. Artificial fill associated with existing improvements at the site was encountered in all borings. The fill materials predominantly consisted of loose to medium dense silty sand and clayey sand and stiff to very stiff sandy clay with gravel was encountered in the

borings. Coarse gravel and cobbles were also encountered in Borings LB-3 and LB-4 at depths of approximately 6 to 7 feet. The fill was encountered to the maximum depth explored of 11½ feet, except at Boring LB-7 where native soils were encountered at approximately 10 feet. The depth of fill below the maximum explored depth is not known and may vary throughout the site.

Table 2 – Pavement Sections and Fill at Northern Portion of Site

Boring No.	Pavement Section (inches)		Boring Depth (feet)	Depth of Artificial Fill (feet)
	AC	AB		
LB-2	3	3	11.5	0 - 11.5
LB-3*	12	4	7	0 - 7
LB-4*	5	3	6.5	0 - 6.5
LB-5	-	-	11.5	0 - 11.5
LB-6	4	3	11.5	0 - 11.5
LB-7	12	6	11.5	0 - 10

* Boring terminated due to hard drilling conditions/refusal

2.3 Soil Corrosivity

In general, soil environments that are detrimental to concrete have high concentrations of soluble sulfates and/or pH values of less than 5.5. Soils with chloride content greater than 500 ppm per California Test 532 are considered corrosive to steel, either in the form of reinforcement protected by concrete cover or plain steel substructures, such as steel pipes. Additionally, soils with a minimum resistivity of less than 1,000 Ohm-cm are considered corrosive to ferrous metal.

Based on the laboratory test results, the subsurface soils have low soluble sulfate contents. Therefore, the potential for sulfate attack on concrete is considered low. The tested soils are not considered excessively corrosive to buried ferrous metal in direct contact with the soils.

2.4 Groundwater

Groundwater was encountered at the lift station and tank site during our field exploration at depths of 7 to 8 feet, corresponding to approximately elevation 5 feet msl. The groundwater depth at 17 feet measured in Boring LB-1 does not seem to be representative due to the fine-grained nature of the subsurface soils and the boring was not left open long enough. Groundwater was not encountered in the borings drilled to a maximum depth of 11.5 feet at the northern portion of the site that is located at a higher elevation.

Due to the proximity of the site to the Pacific Ocean and Loma Alta Marsh, the depth to groundwater is expected to be influenced by tidal fluctuations and ground and surface water within the marsh. Additionally, fluctuations of the groundwater level, localized zones of perched water, and an increase in soil moisture should be anticipated during and following the rainy seasons or periods of locally intense rainfall or storm water runoff.

2.5 Faulting

No active faults are mapped or known to cross the site and the site is not located within an Alquist-Priolo Earthquake Fault Zone (Bryant and Hart, 2007). Known regional active faults that could produce significant ground shaking at the site include the Newport-Inglewood, Rose Canyon, Palos Verdes and Elsinore faults located approximately 4 miles, 5 miles, 21 miles, and 24 miles, respectively, from the site.

2.6 Seismicity and Ground Shaking

The principal seismic hazard to the site is ground shaking resulting from an earthquake occurring along any of several major active and potentially active faults in southern California, including those mentioned above. The intensity of ground shaking at a given location depends primarily upon the earthquake magnitude, the distance from the source, and the site response characteristics. Peak horizontal ground accelerations are generally used to evaluate the intensity of ground motion. Using the United States Geological Survey (USGS) Seismic Design Maps (USGS, 2014), the peak ground acceleration for the Maximum Considered Earthquake (MCE_G) adjusted for the Site Class effects (PGA_M) is 0.49g. Based on the USGS online interactive deaggregation program (USGS,

2008), the modal seismic event is Moment Magnitude (M_W) 6.7 at a distance of 4.6 miles.

2.7 Liquefaction

Liquefaction is a seismic phenomenon in which loose, saturated, fine-grained granular soils behave similarly to a fluid when subjected to high-intensity ground shaking. Liquefaction occurs when three general conditions exist: 1) shallow groundwater; 2) low density, fine, clean sandy soils; and 3) high-intensity ground motion.

We performed an evaluation for liquefaction potential at the site and its effects on the proposed improvements in accordance with guidelines in the CGS Special Publication 117A (CGS, 2008). The following input parameters were utilized in our evaluation:

- Historically high groundwater depth at 5 feet below existing ground surface;
- Site Class adjusted peak ground acceleration (PGA_M) of 0.49g per Section 11.8.3 of ASCE 7-10;
- Modal Moment magnitude of 6.7 determined by deaggregation of the seismic hazards using USGS online deaggregation program; and
- Soil profile obtained from the CPT soundings. A CPT sounding yields several hundred continuous data points throughout the soil column, producing a more realistic model of the actual soil profile compared to a hollow-stem auger boring with SPT blow counts that are typically taken at 5-foot intervals.

Results of the analysis are presented in Appendix D and indicate the presence of liquefiable soil layers within the younger alluvial deposits at depths between 10 and 60 feet below existing ground surface. The liquefiable layers are relatively thin and isolated.

Seismically-induced settlement consists of dry dynamic settlement (above groundwater) and liquefaction-induced settlement (below groundwater). Based on our analysis, seismically-induced settlement was estimated to be on the order of ½ inch, with a differential settlement of approximately one half of the total settlement.

Seismically-induced lateral spreading involves primarily lateral movement of earth materials due to ground shaking. For lateral spreading to occur, the liquefiable zone must be continuous, unconstrained laterally, and free to move along gently sloping ground toward an unconfined area. Lateral spreading results in near-vertical cracks with predominantly horizontal movement of the soil mass involved. The Pacific Ocean to the west of the site presents a potential unconfined area for lateral spreading to occur. However, due to the relatively thin and isolated layers of liquefiable soils below the lift station and tanks, the potential for lateral spreading to impact the proposed structures is considered low.

2.8 Earthquake-Induced Seiches and Tsunamis

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Due to lack of enclosed body of water near the vicinity of the site, the risk for seiches at the site is low.

Review of the California Geological Survey's *Tsunami Inundation Map for Emergency Planning* (CGS, 2009) indicates that the site is located within a tsunami inundation area as shown on Figure 4, *Tsunami Hazard Map*. The southern portion of the site adjacent to Loma Alta Marsh at approximate elevations of 13 feet msl may be subject to inundation if a Tsunami event occurs.

2.9 Flood Hazard

Based on our review of the Federal Emergency Management Agency (FEMA) flood map public database, the southern portion of the site is located within a flood hazard zone. Figure 5, *Flood Hazard Zone Map* shows the site location and the 100-year and 500-year flood zones. The 100-year flood, also known as the base flood, is the flood that has a 1 percent chance of being equaled or exceeded in any given year (FEMA, 2012).

3.0 RECOMMENDATIONS

Presented below are the geotechnical recommendations for design and construction of the sewer lift station and tanks. The recommendations are based upon the exhibited geotechnical engineering properties of the soils and their anticipated response both during and after construction as well as proper field observation and testing during construction. The recommendations are considered minimum and may be superseded by more restrictive requirements of the architect, structural engineer, building code, or governing agencies.

3.1 Site Grading

All site grading should be performed in accordance with the applicable local codes and in accordance with the project specifications that are prepared by the appropriate design professional. As a minimum, the earthwork guidelines in the following sections should be followed.

3.1.1 Site Preparation

Prior to construction, the lift station and tanks area should be cleared of any vegetation, existing improvements and debris. Existing pipelines should also be removed if they interfere with the proposed construction. Cavities resulting from removal of the existing underground structures and lines should be excavated to expose competent material before being properly backfilled and compacted.

3.1.2 Excavation Bottom Stabilization

Based on our borings and CPTs, the soils at the bottom of lift station and tanks are expected to consist of soft and wet clay with high plasticity. The clay is highly sensitive to heavy equipment that could result in subgrade stability problems. To obtain a firm working surface and to provide a uniform support for heavy equipment, a 6-inch layer of coarse (2- to 4-inch nominal particle size) crushed rock should be spread out across the excavation bottom and pushed into the subgrade to serve as working mat. If the excavation bottom is still unstable, another 6-inch layer of crushed rock should be placed and worked into the subgrade. The process should be repeated until a firm working surface is achieved.

3.1.3 Overexcavation and Recompaction

Preparation of areas to support new foundations is recommended to include a specific minimum depth of overexcavation below the bottom of the foundation to establish a structural fill layer of minimum thickness. To provide a uniform support and reduce the potential for differential settlement, mat foundation, if used for support of the lift station and tanks, should be underlain by a minimum 3 feet of compacted crushed aggregate. Foundation for other at-grade appurtenant structures should also be underlain by 3 feet of compacted fill. The remedial removals should extend horizontally a minimum of 3 feet beyond outside edges of the foundation, where feasible.

Local conditions may be encountered which may require additional removals and recompaction. The exact extent of removals can best be determined during grading by the geotechnical engineer when direct observation and evaluation of materials are possible. Prior to placing fill materials, the subgrade should be scarified to a minimum depth of 6 inches, moisture conditioned, and proofrolled. Any soft and/or unsuitable materials encountered at the bottom of the excavations should be removed and replaced with fill material.

3.1.4 Fill Placement and Compaction

The onsite soils to be used as compacted structural fill should be free of organic material or construction debris. Imported fill soil, if any, should be approved by the geotechnical engineer prior to placement as fill. Fill soils should be placed in loose lifts not exceeding 8 inches, moisture-conditioned as necessary to at least two percent above moisture optimum and compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method D 1557. The subsurface soils to be exposed by grading and excavating activities at the site are expected to have high moisture content. The soils will likely require drying or mixing with drier soils prior to placement as compacted fill prior to placement as fill.

3.2 Foundation Recommendations

Due to the non-uniform soil conditions expected at the foundation subgrade, the lift station and tanks should be supported on a mat foundation or piles. The mat

foundation should be designed for the estimated settlement and the subgrade should be prepared as recommended in this report.

3.2.1 Mat Foundation

Mat foundation, if used, for the planned lift station and tanks should be underlain by a minimum 3 feet of compacted crushed aggregate. The mat foundation may be designed using an allowable bearing capacity of 2,200 psf and a coefficient of vertical subgrade reaction of 120 pounds per cubic inch (pci). The recommended bearing value is a net value and may be increased by one-third for wind loading only. Total settlement of the mat foundation is estimated to consist of ½ inch of static settlement and ½ inch of seismic settlement. Differential settlement of the mat foundation is expected to be half of the total settlement over the distance of 30 feet. If the allowable bearing capacity is increased to 2,650 psf, the total settlement is estimated as 2 inches static settlement plus ½ inch of seismic settlement.

The estimated total and differential settlement and the resulting angular distortion are recommended to be reviewed by the structural engineer to determine if any special detailing or other design techniques are required for structural connections to ensure the proposed structures can sufficiently withstand the estimated level of distortion without structural failure.

Resistance to lateral loads will be provided by a combination of friction between the soil and foundation interface and passive pressure acting against the vertical portion of the footings. For calculating lateral resistance, a passive pressure of 250 psf per foot of depth (below the groundwater table) or 390 pcf (above the groundwater table), limited to a maximum of 3,500 psf, and a frictional coefficient of 0.35 may be used. These friction and passive pressure values may be used in combination without reduction. The above values do not contain an appreciable factor of safety, so the structural engineer should apply the applicable factors of safety and/or load factors during design.

3.2.2 Deep Foundation

A deep foundation system may be used for support of the lift station and tanks if mat foundation system is not feasible. Cast-In-Drilled-Hole piles

may encounter difficulties during construction due to the relatively shallow groundwater. From an engineering and construction standpoint, driven precast concrete piles appear to be the preferred choice for the deep foundation system.

The piles should be driven through the compressible and liquefiable soils (younger alluvium) and embedded into the older alluvium or bedrock. The axial capacities of 12-inch and 14-inch precast concrete piles for frequently applied dead plus live load are presented on Figure 6 and may be used for preliminary design. The actual pile length should be determined by the structural engineer based on the structural loads. Uplift capacity can be taken as 40 percent of the downward capacity. A factor of safety of 2.0 may be used to obtain the allowable pile capacities and the capacities may be increased by one-third for transient loads such as wind or seismic forces. To avoid group effects, the pile on-center spacing should be at least three times its largest dimension.

Settlement of piles, generally resulting from settlement of the supporting soils and elastic compression of piles, is expected to be on the order of ½ inch. The settlement analysis should be evaluated when the actual structural load and pile cap configuration become available.

As shown on Figure 3, the depth to the Quaternary Older Alluvium (Qol) and Santiago Formation (Tsa) varies across footprint of the lift station and tanks. Pile driving within the Qol and Tsa is expected to be difficult. To properly delineate the geologic contact and determine the pile lengths, additional geotechnical exploration consisting of CPTs or borings and/or geophysical testing should be performed after the demolition of existing improvements.

Pile drivability analysis should be performed to determine the refusal criteria and hammer and equipment selection to drive the piles. Driving shoes and possibly predrilling may be required for the pile installation.

3.3 Slab-On-Grade

Concrete slabs-on-grade subjected to special loads should be designed by the structural engineer. Where conventional light floor loading conditions exist, the following minimum recommendations for conventional slabs-on-grade should be

used. More stringent requirements may be required by local agencies, the structural engineer, the architect, or the CBC.

- A minimum slab thickness of 5 inches. Slab reinforcement should be designed by the structural engineer but as a minimum should consist of No. 3 rebar placed at 24 inches on center in each direction and provided with adequate concrete cover.

- A vapor barrier, 10-mil or thicker, should be placed below slabs where moisture-sensitive floor coverings or equipment is planned. The moisture retarder should be properly sealed at all joints and any penetrations.

- To reduce the potential for excessive cracking, concrete slabs-on-grade should be provided with construction or weakened plane joints at frequent intervals. Joints should be laid out to form approximately square panels.

- The subgrade soil should be wetted prior to placing the vapor barrier, steel, or concrete.

Our experience indicates that use of reinforcement in slabs can generally reduce the potential for drying and shrinkage cracking. Some cracking should be expected as the concrete cures. Minor cracking is considered normal; however, it is often aggravated by a high water/cement ratio, high concrete temperature at the time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations can also be expected. The use of low slump concrete can reduce the potential for shrinkage cracking.

3.4 Lateral Earth Pressures

The following parameters may be used for design of retaining walls:

Table 3 – Equivalent Fluid Pressure

Condition	Level Backfill	
	Drained	Undrained
Active	37 pcf	80 pcf
At-Rest	57 pcf	90 pcf

Retaining structures should be provided with a drainage system to prevent buildup of hydrostatic pressure behind the wall. Hydrostatic pressure should be included in the retaining wall design if a drainage system is not provided (undrained condition). The above values do not contain an appreciable factor of safety, so the structural engineer should apply the applicable factors of safety and/or load factors during design.

Cantilever walls that are designed to yield at least 0.001H, where H is equal to the wall height, may be designed using the active condition. Rigid walls and walls braced at the top should be designed using the at-rest condition. A seismic earth pressure increment of 15 pcf should be combined with the active pressure to evaluate seismic loading.

Passive pressure of 250 pcf (below groundwater table) or 390 pcf (above groundwater table) may be used to compute soil resistance to lateral structural movement. In addition, for sliding resistance, a frictional resistance coefficient of 0.35 may be used at the concrete and soil interface. The lateral passive resistance should be taken into account only if it is ensured that the soil providing passive resistance, embedded against the foundation elements, will remain intact with time.

In addition to the above lateral forces due to retained earth, surcharge due to improvements, such as an adjacent structure or traffic loading, should be considered in the design of the retaining wall.

3.5 CBC Seismic Design Parameters

Strong ground shaking due to seismic activity is anticipated at the site. To reduce the effects of ground shaking produced by regional seismic events, seismic design should be performed in accordance with the applicable building codes. The following data may be considered for the seismic analysis of the project based on the 2013 CBC.

Table 4 – Seismic Design Parameters

Categorization/Coefficient	Design Value
Site Latitude	33.1788N
Site Longitude	-117.3695W
Site Class	D
Mapped spectral response acceleration parameter at short period, S_S	1.194
Mapped spectral response acceleration parameter at a period of 1 sec, S_1	0.459
Adjusted spectral response acceleration parameter at short period, S_{MS}	1.221
Adjusted spectral response acceleration parameter at a period of 1 sec, S_{M1}	0.708
Design spectral response acceleration parameter at short period, S_{DS}	0.814
Design spectral response acceleration parameter at a period of 1 sec, S_{D1}	0.472

3.6 Pavement Design

Driveways and parking areas can be constructed using conventional asphalt concrete (AC) over aggregate base (AB). We have designed the pavement sections using a design R-value of 30 for different Traffic Indices (TI) and the minimum pavement thickness is presented in Table 5 below. The pavement design was performed using the method in Caltrans *Highway Design Manual*. Aggregate base should also be compacted to a minimum of 95 percent relative compaction.

Table 5 – Recommended Pavement Sections

Traffic Index	Flexible Pavement (inches)	
	AC	AB
5 or less	3.5	5.0
6	4.5	6.0
7	5.0	8.0

Concrete truck aprons and ramps should have a minimum thickness of 6 inches placed on a minimum of 4 inches of aggregate base. As with any concrete slab, it is important to provide for concrete cracking by constructing weakened plane

and/or construction joints at frequent intervals. The minimum joint spacing and reinforcement for the concrete should be determined by the structural engineer.

3.7 Cement Type and Corrosion

Based on the results of laboratory testing, concrete structures in contact with the onsite soil are expected to have negligible exposure to water-soluble sulfates in the soil. Common Type II cement may be used for concrete construction onsite and the concrete should be designed in accordance with CBC requirements.

The onsite soil is not considered to be excessively corrosive to ferrous metals. However, variance in soil corrosivity is anticipated at the site. Additional soil corrosivity tests should be performed during future grading to verify this finding.

3.8 Pipe Bedding and Trench Backfill

Pipeline trenches should be backfilled with compacted fill in accordance with City of Oceanside requirements and Sections 306-1.2 and 306-1.3 of the *Standard Specifications for Public Works Construction* (Greenbook). Prior to backfilling the trench, pipes should be embedded and covered with granular material that exhibits a Sand Equivalent value of 30 or greater. Based on our laboratory test result, onsite sandy soils are not readily available for use as the bedding zone material. Bedding sands will need to be imported. Pipe bedding should extend to a depth of at least 4 inches below the pipeline invert and at least 12 inches above the springline of the pipe. The presence of silty and clayey soils at the site will necessitate densification of bedding materials by mechanical compaction. Controlled Low Strength Materials (CLSM) may also be used within the bedding zone and the CLSM should conform to Section 201-6 of the *Standard Specifications for Public Works Construction*.

Above the bedding zone, trenches can be backfilled with the onsite material, provided it is free of debris, organic and oversized material greater than 3 inches in largest dimension. Oversized rock (cobbles and/or boulders) should either be removed from the site or pulverized for use in backfill. CLSM may also be used to backfill the trenches.

Backfill should be placed in thin lifts, loose lift thickness being compatible with the earthwork equipment, moisture conditioned, as necessary, and mechanically compacted to a minimum 90 percent relative compaction (ASTM D 1557).

3.9 Additional Geotechnical Services

The geotechnical recommendations presented in this report are based on subsurface conditions as interpreted from limited subsurface explorations and limited laboratory testing. Our recommendations are based on information available at the time the report was prepared and may change as plans are developed. Additional geotechnical investigation and analysis may be required based on final development plans. Leighton Consulting should review the foundation, grading and shoring plans, when they become available.

Geotechnical observation and testing should be conducted during excavation and all phases of grading operations, including the following stages:

- Upon completion of site clearing;
- During shoring installation;
- During overexcavation and recompaction;
- During fill placement;
- After foundation excavations and prior to placement of concrete;
- During backfilling of trenches; and
- When any unusual or unexpected geotechnical conditions are encountered.

4.0 CONSTRUCTION CONSIDERATIONS

4.1 Temporary Excavation

All temporary excavations should be performed in accordance with project plans, specifications, and all OSHA requirements. Excavations 5 feet or deeper should be laid back or shored in accordance with OSHA requirements before personnel are allowed to enter. No surcharge loads should be permitted within a horizontal distance equal to the height of cut or 5 feet, whichever is greater from the top of the cut, unless the cut is shored appropriately as discussed in Section 4.3 of this report.

During construction, the soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor shall be responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and the geotechnical engineer should be maintained to facilitate construction while providing safe excavations.

Based on our borings, the younger alluvium at the project site should be readily excavated using conventional excavating equipment in good working condition. Older alluvium and bedrock may be encountered depending on the depth of the excavations and these materials are relatively difficult to excavate.

4.2 Temporary Dewatering

Groundwater and soils with high moisture content were encountered in our borings and CPTs as shallow as 7 feet below ground surface. Therefore, excavations for construction of the lift station and tanks will encounter groundwater. Groundwater control, such as dewatering, will be required to limit instability of the excavation bottom, side and face. Dewatering procedures and methods should be selected by the contractor based on actual groundwater conditions encountered during construction, and based on the contractor's chosen means-and-methods of construction.

Depending on chosen means-an-methods of construction, it should be anticipated that significant amount of groundwater will need to be removed during construction due to the proximity of the site to the Pacific Ocean and Loma Alta Marsh. Pumping tests may be performed by the contractor at his/her discretion to estimate the amount of groundwater that needs to be removed. The design,

implementation, inspection, monitoring and maintenance of the dewatering and treatment system shall be in full compliance with applicable laws and regulations that govern water quality. All water encountered during construction must be disposed in such a manner that will not damage public or private property or create a nuisance for health and be in compliance with the requirements of the governing agencies

4.3 Temporary Shoring

Trench excavations may be supported by several methods including cross-braced hydraulic shoring, conventional shields, sheet piles, even possibly soldier piles with wood lagging. The choice should be left to the contractor's judgment since economic considerations and/or the individual contractor's construction experience may determine which method is more economical and/or appropriate. The contractor and shoring designer should also perform additional geotechnical studies as necessary to refine the means-and-methods of shoring construction. Shoring may be desired or even necessary to reduce excavation quantities, reduce pavement restoration quantities, keep traffic lanes open and/or protect existing adjacent utilities and/or other improvements.

Support of all adjacent existing structures without distress is the contractor's responsibility. In addition, it should be the contractor's responsibility to undertake a pre-construction survey with benchmarks and photographs of the adjacent properties.

Shoring systems should be designed by a California licensed civil or structural engineer. As preliminary design guidelines, we present the following geotechnical parameters for shoring design. Typical cantilever shoring should be designed based on the active fluid pressure indicated in Table 3. The use of the at-rest earth pressure is recommended if the shoring is not free to rotate to mobilize active earth pressure. If excavations are braced at the top and at specific design intervals, the earth pressure may be approximated by a rectangular soil pressure distribution with the pressure per foot of width equal to 25H, where H is equal to the depth of the excavation being shored. These values are for a level ground and drained condition behind the shoring system. If the retained soils are not drained, hydrostatic pressure should be considered in the shoring design.

The above values do not contain an appreciable factor of safety, so the structural/shoring engineer should apply the applicable factors of safety and/or

load factors during design. Lateral pressures from surcharges and superimposed loads, including loads from vehicle traffic and foundation bearing stresses of adjacent structures, should be included in the design of the temporary shoring in situations where the loads are located in close proximity.

5.0 GEOTECHNICAL CONSIDERATIONS FOR PLANT DECOMMISSIONING

The northern portion of the plant that will be decommissioned for future development is currently occupied by administrative buildings and several above-grade and below-grade wastewater treatment tanks. We understand that the underground tanks and associated pipelines are up to 20 to 30 feet deep. Prior to construction, these tanks and pipelines and other subsurface improvements, including vaults and building foundations, should be removed. Cavities resulting from removal of the existing underground structures and lines should be excavated to expose competent material and properly backfilled with compacted soils.

Based on our borings, the site is mantled by artificial fill. The depth of fill appears to vary throughout the site and is expected to be relatively deep where underground tanks and vaults are present. Since no documentation was available on the artificial fill, we recommend that the undocumented existing fill within future building pads be removed to competent material and recompacted.

The onsite soils free of organic material or construction debris can be used as compacted structural fill to backfill the excavations and for future grading of the site. Soils excavated for construction of the proposed lift station and tanks may be stockpiled at the site for future use. From a geotechnical standpoint and with approval from the City, concrete from demolition of the existing improvements may be pulverized and blend with onsite soils, if necessary, to an appropriate gradation and used as compacted fill materials. Fill soils should be placed in loose lifts not exceeding 8 inches, moisture-conditioned as necessary to at least two percent above moisture optimum and compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method D 1557.

The recommendations presented in this report may be used for planning of the future development on the northern portion of the site. A comprehensive geotechnical investigation should be performed to develop geotechnical recommendations for site grading, foundation design, and other geotechnical aspects of the proposed project.

6.0 LIMITATIONS

It should be noted that the recommendations in this report are subject to the limitations presented in this section. An information sheet prepared by GBC (Geotechnical Business Council) is also included at the rear of the text. We recommend that all individuals using this report read the limitations along with the attached information sheet.

The geotechnical recommendations presented in this report are based on subsurface conditions as interpreted from limited subsurface explorations and limited laboratory testing. Our recommendations are based on information available at the time the report was prepared and may change as plans are developed. Additional geotechnical investigation and analysis may be required based on final development plan. Leighton Consulting should review the foundation, grading and shoring plans, when they become available.

The nature of many sites is such that differing soil or geologic conditions can be present within small distances. Changes in subsurface conditions can and do occur over time. Therefore, the findings and recommendations presented in this report are only valid if Leighton Consulting has the opportunity to observe the subsurface conditions during grading and construction in order to confirm that our preliminary data are representative for the site.

Our professional services were performed in accordance with the prevailing standard of professional care as practiced by other geotechnical engineers in the area. We make no other warranty, either expressed or implied. The report may not be used by others or for other projects without the expressed written consent of our client and our firm.

7.0 REFERENCES

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Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

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Legend

- LB-8 / T.D.51.5' GW@8' — Approximate Location of Boring with Total Depth (T.D.) and Groundwater depth
- CPT-2 / T.D.30' GW@8' — Approximate Location of CPT with Total Depth (T.D.) and Groundwater and depth
- Approximate Location of Sewer Lift Station and Tanks
- A A' — Location of Geotechinical Cross Section
- Geologic Contact Line
- Qa — Quarternary Younger Alluvium
- Qol — Quarternary Older Alluvium
- Qb — Beach Deposits

Southern California Regional Rail A

Site Boundary

A

A'

LB-7 T.D.11.5' No GW

LB-6 T.D.11.5' No GW

LB-4 T.D.7' No GW

LB-2 T.D.11.5' No GW

LB-5 T.D.11.5' No GW

LB-3 T.D.7' No GW

LB-1 T.D.31.5' GW@17'

CPT-1 T.D.76' GW@7'

LB-8 T.D.51.5' GW@8'

CPT-2 T.D.30' GW@8'

Qol

Qa

Qb

Loma Alta Marsh

S Myers St

Croswaithe St

Tait St

Witherby St

S Pacific St

298

210

1301

1401

1501

N

0 100 200

Feet

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Project: 11224.001	Eng/Geol:DJC/JMP
Scale:1 " = 100 '	Date: May 2016

Base Map: ESRI ArcGIS Online 2016
Thematic Information: Leighton
Author: Leighton Geomatics (asakowicz)

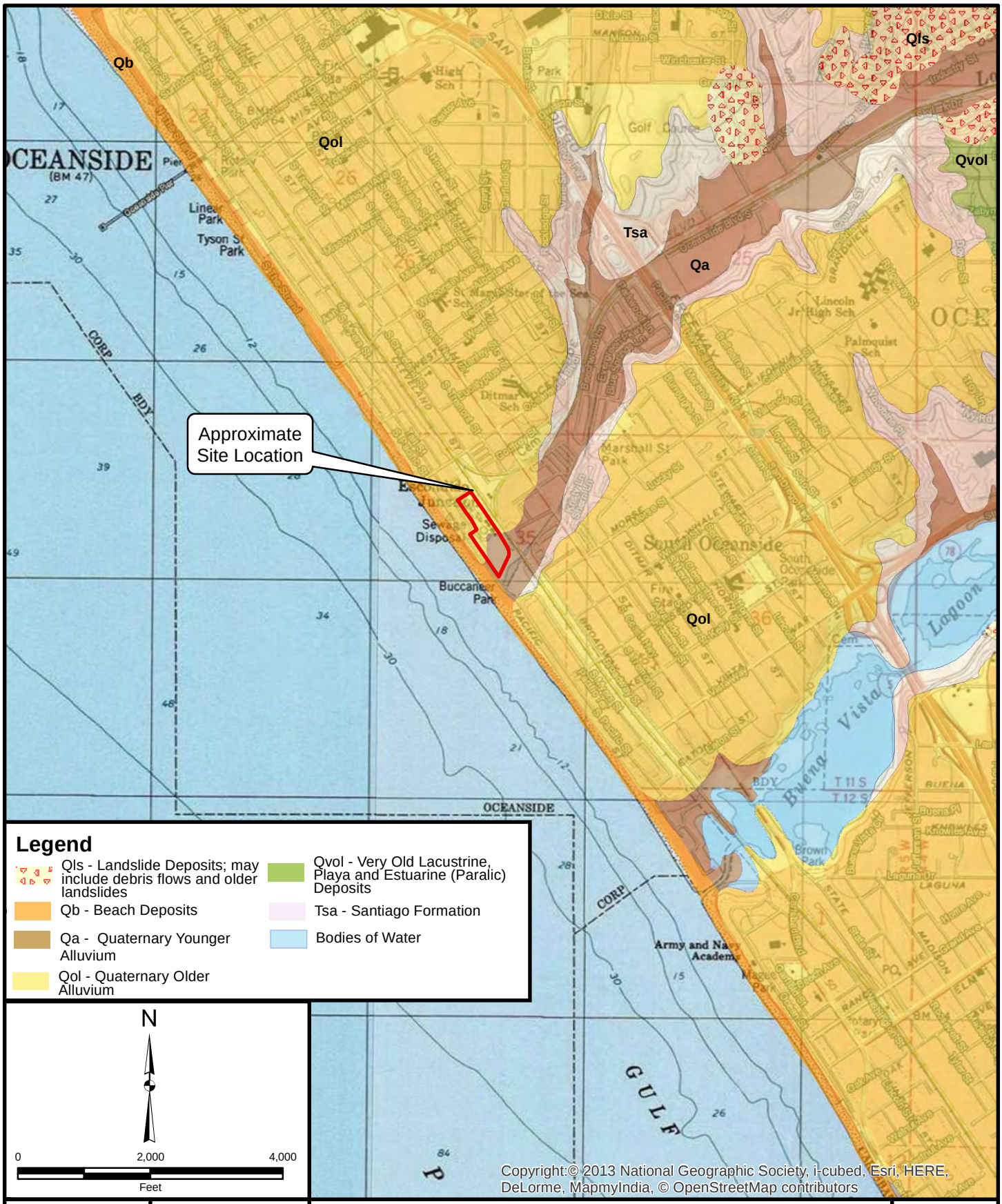
GEOTECHNICAL MAP

La Salina Lift Station & Plant Decomissioning
1330 South Tait Street
City of Oceanside, CA

Figure 1

Leighton

Map Saved as V:\Drafting\11224\001\Maps\11224_001_F01_GTM_GLines-2016-05-24.mxd on 5/24/2016 2:02:37 PM



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Scale:1 " = 2,000 '	Date: May 2016

Base Map: ESRI ArcGIS Online 2016
Thematic Information: Leighton, USGS
Author: Leighton Geomatics (asakowicz)

REGIONAL GEOLOGY MAP

La Salina Lift Station & Plant Decomissioning
1330 South Tait Street
City of Oceanside, CA

Figure 2

Leighton

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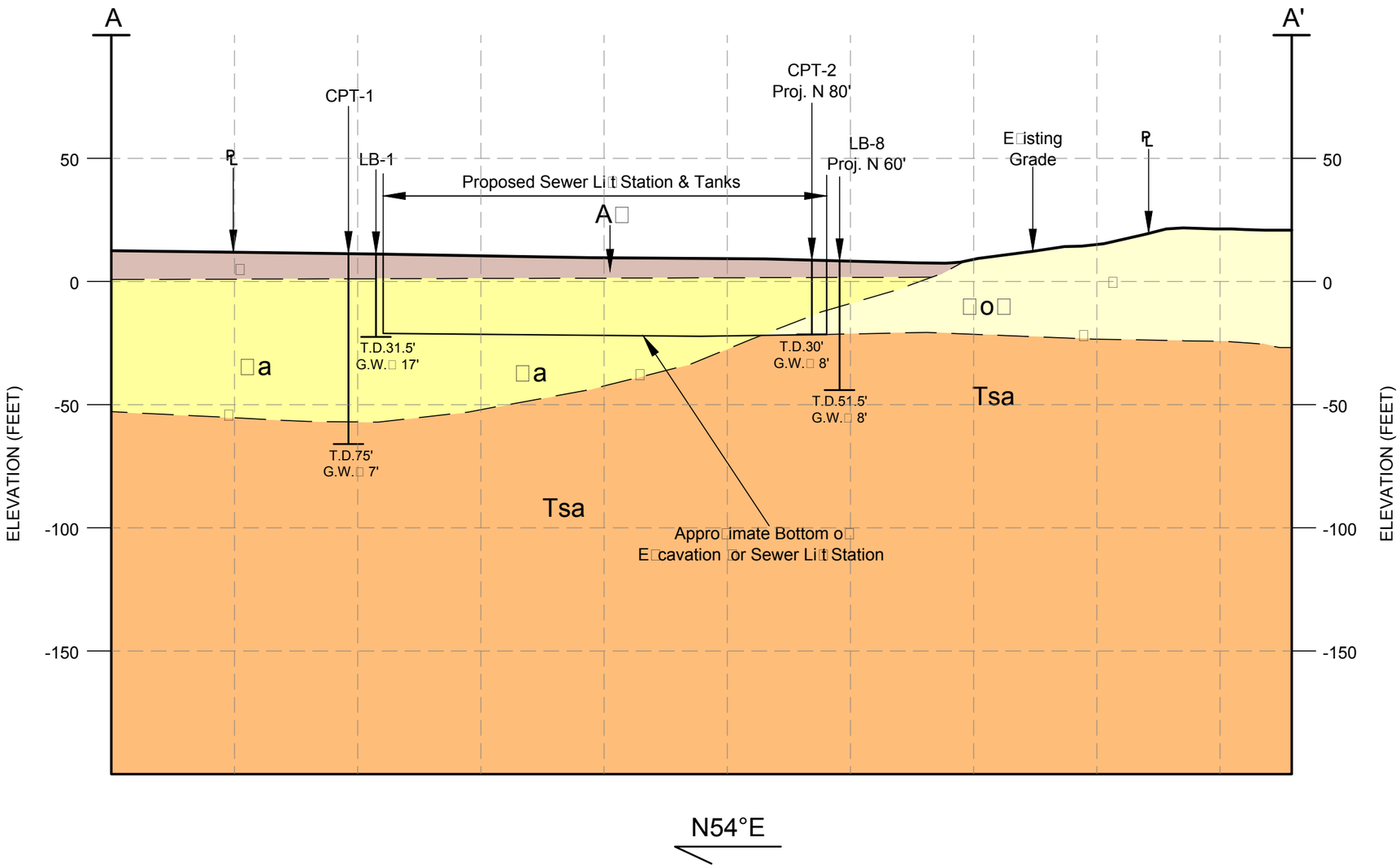


LEGEND

Qa	Quaternary Younger Alluvium
Qo	Quaternary Older Alluvium
Tsa	Santiago Formation

Proj: 11224.001	Eng/Geo: DJC/JMP
Scale: 1"=20'	Date: May 2016
Reference:	

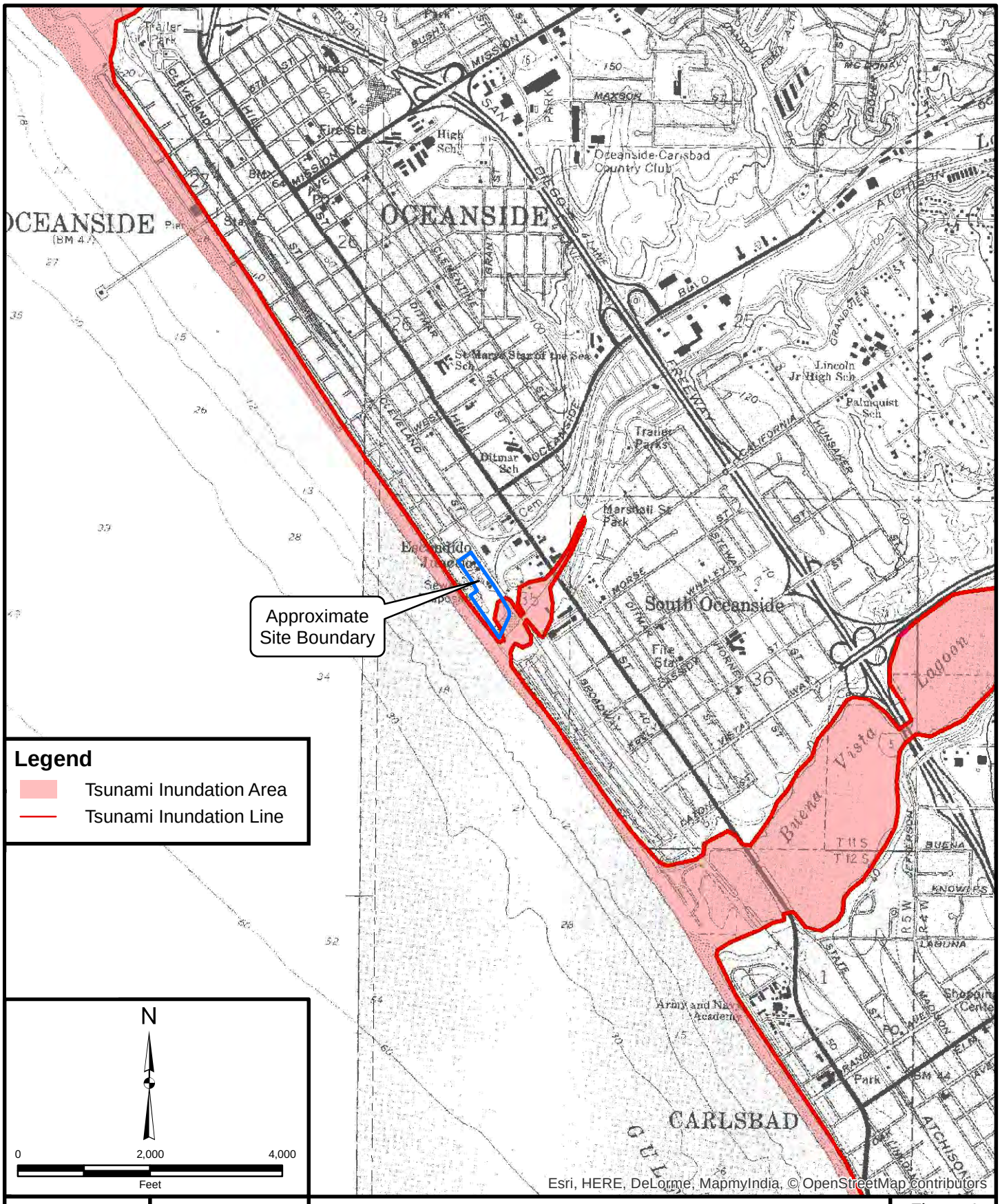
P:\DRAFTING\11224001\CAD\2016-05-19\11224-001 F03 CSA 2016-05-25.DWG (05-25-16 3:17:36PM) Plotted by: tran

GENERALIZED CROSS SECTION A-A'

La Salina Lift Station and Plant Decomissioning
1330 South Tait Street
City of Oceanside, California

Figure 3

Leighton



Project: 11224.001	Eng/Geol:DJC/JMP
Scale:1 " = 2,000 '	Date: May 2016

Base Map: Tsunami Inundation Map for Emergency Planning Oceanside Quadrangle/San Luis Rey Quadrangle June,2009 California Emergency Management Agency, CGS, and USC
Thematic Information: Leighton, USGS
Author: Leighton Geomatics (asakowicz)

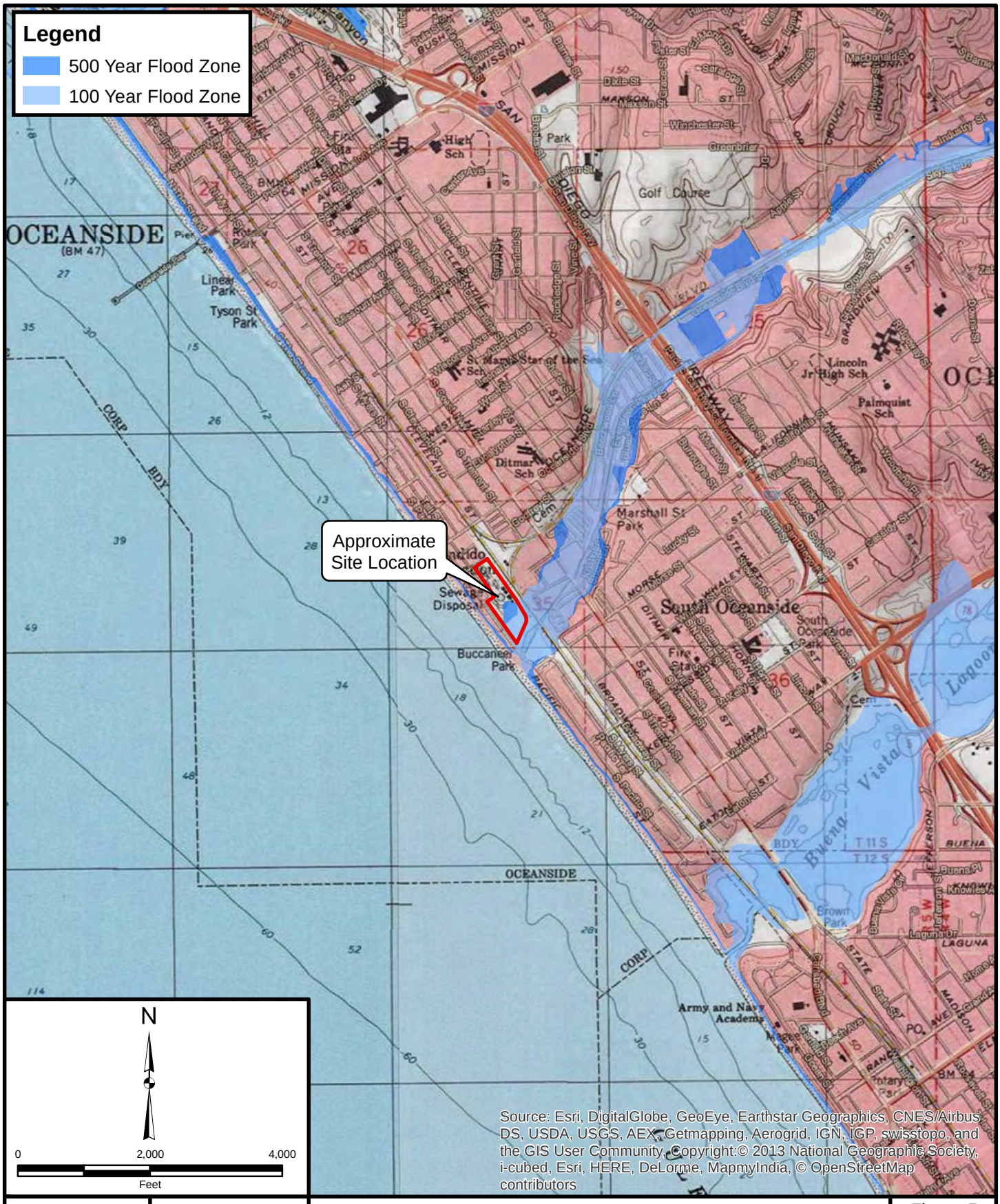
TSUNAMI HAZARD MAP

La Salina Lift Station & Plant Decomissioning
1330 South Tait Street
City of Oceanside, CA

Figure 4

Leighton

Map Saved as V:\Drafting\11224\001\Maps\11224_001_F03_Tsunami_2016_05_10.mxd on 5/19/2016 1:24:44 PM



Project: 11224.001	Eng/Geol:DJC/JMP
Scale:1 " = 2,000 '	Date: May 2016

Base Map: ESRI ArcGIS Online 2016
Thematic Information: Leighton, CA DWR, FEMA
Author: Leighton Geomatics (asakowicz)

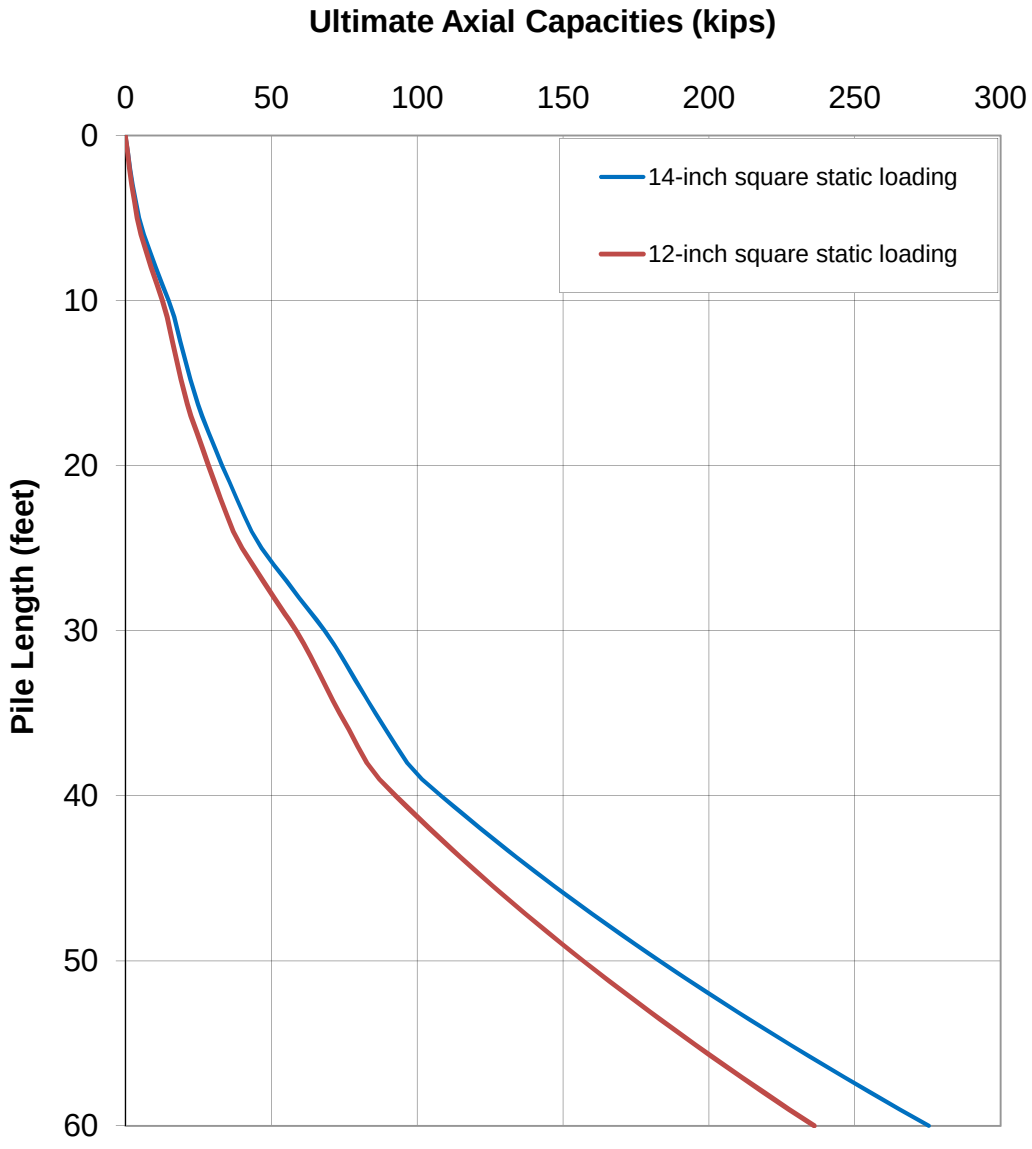
FLOOD HAZARD ZONE MAP

La Salina Lift Station & Plant Decomissioning
1330 South Tait Street
City of Oceanside, CA

Figure 5

Leighton

Map Saved as V:\Drafting\11224\001\Maps\11224_001_F04_Flood_2016_05_19.mxd on 5/19/2016 1:37:02 PM



Note:
1. The axial capacities are based on skin friction only
2. A minimum factor of safety (FS) of 2.0 should be applied to estimate allowable capacities
3. Ultimate capacity in tension should be 40% of the ultimate capacity in compression

ULTIMATE AXIAL CAPACITY 12-INCH AND 14-INCH SQUARE CONCRETE PILE	PROJECT NAME : LA SALINA PROJECT NUMBER : 11224.001 DESIGNED/CHECKED BY: SP/DJC DATE: 5/18/2016	**Figure 6**

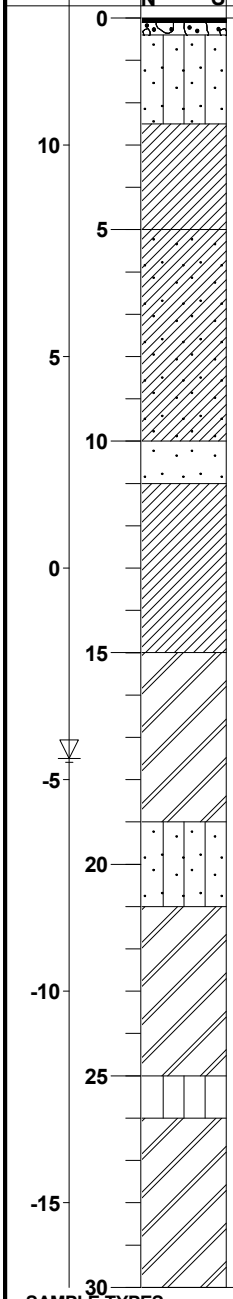
APPENDIX A

GEOTECHNICAL BORING LOGS

Leighton

GEOTECHNICAL BORING LOG LB-1

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	13'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK



Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0			B-1					@ Surface: 1 inch of asphalt over 4 inches of base course	
								SM	**Artificial Fill: (Af)** @1': Silty SAND, reddish brown, slightly moist, fine to coarse grained	CR, RV
								CL	@ 2.5': Sandy CLAY, reddish brown to light gray, slightly moist, medium plasticity	
	5			R-1	21 22 11	129	9	SC	@ 5': Clayey SAND with gravel, yellowish brown, moist, medium dense, fine to coarse-grained	-200, DS
	10			S-1	7 8 10			SP	**Quaternary Younger Alluvium: (Qa)** @ 10': SAND, light gray, moist, medium dense, fine grained	
								CL	@ 11': CLAY, light gray, very moist to wet, stiff to very stiff, medium to high plasticity	
	15			R-2	16 16 18	73	49	CH	@ 15': Fat CLAY, dark gray, very moist to wet, very stiff, high plasticity	AL
	20			S-2	2 3 4			SM	@ 20': interbedded Silty SAND, gray, very moist to wet, fine grained	
								CH	@21': Fat CLAY, dark gray, very moist to wet, medium stiff, high plasticity	
	25			R-3	15 22 25	75	46	ML	@ 25': Sandy SILT, light gray, very moist to wet, medium dense	-200
								CH	@ 26': Fat CLAY, light gray, very moist to wet, very stiff, medium to high plasticity	

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-1

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	13'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30	N S		S-3	1 3 4			CH	@ 30': Fat CLAY, gray, very moist to wet, medium stiff, high plasticity	AL
-20	35								**Notes:** Total Depth: 31.5 feet Groundwater encountered @ 17.5 feet during drilling Boring backfilled with cuttings.	
-25	40									
-30	45									
-35	50									
-40	55									
-45	60									

Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH



*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-2

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	24'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							*This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	
20	0								@ Surface: 3 inches of asphalt over 3 inches of base course **Artificial Fill: (Af)** @ 1': Silty SAND, yellowish brown, slightly moist, fine to coarse grained	
	5			S-1	1 1 2			SM	@ 5': moist, loose, fine to coarse grained, friable, trace of interbedded clay layers	
15										
10	10			R-1	5 5 11	106	18		@ 10': gray brown to yellowish brown, moist, medium dense, friable	
									Notes: Total Depth: 11.5 feet Groundwater not encountered during drilling Boring backfilled with cuttings and patched with cold-mix asphalt	
10	15									
5	20									
0	25									
-5	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH



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GEOTECHNICAL BORING LOG LB-3

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	25'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
25	0								@ Surface: 12 inches of asphalt over 4 inches of base course	
				B-1				SM	**Artificial Fill: (Af)** @1.5': Silty SAND, brown, slightly moist, fine to coarse grained	
20	5			R-1	5 10 11	121	11	SC	@ 5': Clayey SAND, light gray, moist, medium dense, fine to coarse grained, some gravel	
									@7': hard drilling (refusal) **Notes:** Total Depth: 7 feet Groundwater not encountered during drilling Boring backfilled with cuttings and patched with cold-mix asphalt	
15	10									
10	15									
5	20									
0	25									
-5	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
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- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
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- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH



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GEOTECHNICAL BORING LOG LB-4

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	22'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
20	0							SM	@ Surface: 5 inches of asphalt over 3 inches of base course **Artificial Fill: (Af)** @ 1': Silty SAND, light yellowish brown, slightly moist, medium dense, fine to medium grained	
	5			S-1	7 7 8					
15									@6.5': some coarse gravel and rounded cobbles in soil cuttings, hard drilling (refusal). Potential presence of boulders **Notes:** Total Depth: 6.5 feet Groundwater not encountered during drilling Boring backfilled with cuttings and patched with cold-mix asphalt.	
	10									
10										
	15									
5										
	20									
0										
	25									
-5										
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
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GEOTECHNICAL BORING LOG LB-5

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	24'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							*This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	
20	0							SM	@ Surface: gravel **Artificial Fill: (Af)** @1': Silty SAND, reddish brown, slightly moist, fine to coarse grained	
15	5			R-1	7 14 14	123	10	CL	@ 5': Sandy CLAY, light gray to orange brown, moist, stiff to very stiff, low plasticity, some gravel	
10	10			S-1	3 3 4			SC	@ 10': Clayey SAND, dark brown, moist, loose, fine grained	
5	15								**Notes:** Total Depth: 11.5 feet Groundwater not encountered during drilling Boring backfilled with soil cuttings	
0	20									
-5	25									
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
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- DS DIRECT SHEAR
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GEOTECHNICAL BORING LOG LB-6

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	24'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							*This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	
20	0								@ Surface: 4 inches of asphalt over 3 inches of base course	
								SM	**Artificial Fill: (Af)**	
									@ 1': Silty SAND, light brown, moist, fine to medium grained, some clay	
15	5			S-1	2 2 3				@ 5': loose	
10	10			R-1	5 5 8		13		@ 10': loose to medium dense	
								CL	@ 11': CLAY, gray, moist, stiff, medium plasticity	
5	15								**Notes:** Total Depth: 11.5 feet Groundwater not encountered during drilling Boring backfilled with cuttings and patched with cold-mix asphalt.	
0	20									
-5	25									
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
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GEOTECHNICAL BORING LOG LB-7

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	34'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							*This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	
30	0								@ Surface: 12 inches of asphalt over 6 inches of base course	
								SM	**Artificial Fill: (Af)** @ 1.5': Silty SAND, brown, slightly moist, fine to coarse grained	
25	5			R-1	4 7 11	105	15	CL	@5': CLAY, gray brown, moist, stiff, trace of fine grained sand	
20	10			S-1	4 6 7			SP CL	**Quaternary Older Alluvium: (Qol)** @10': SAND, gray, moist, medium dense, fine to medium grained interbedded with CLAY, gray, moist, stiff, some orange oxidation. **Notes:** Total Depth: 11.5 feet Groundwater not encountered during drilling Boring backfilled with cuttings and patched with cold-mix asphalt	
15	15									
10	20									
5	25									
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
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GEOTECHNICAL BORING LOG LB-8

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	14'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								**Artificial Fill: (Af)**	
									@ 0-25' drilled without sampling. See CPT-2 for soil profile	
10	5								**Quaternary Younger Alluvium: (Qa)**	
5										
	10									
0										
	15									
-5										
	20								**Quaternary Older Alluvium: (Qol)**	
-10										
	25			R-1	20 32 5			SM	@ 25': Silty SAND to Sandy SILT, gray, wet, medium dense, fine grained sand	-200
-15										
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
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- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
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GEOTECHNICAL BORING LOG LB-8

Project No.	11224.001	**Date Drilled**	4-8-16
Project	La Salina Lift Station and Plant Decomissioning	**Logged By**	LK
Drilling Co.	Baja Exploration	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	14'
Location	See Figure 1 - Geotechnical Map	**Sampled By**	LK

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			S-1	27 50/6"			SM	**Quaternary Older Alluvium/Possible Weathered Bedrock: (Qol/Tsa)** @ 30': Silty SAND, yellowish brown, wet, very dense, fine grained, trace medium grained	
-20	35			R-2	37 50/4"	111	19		**Santiago Formation: (Tsa)** @35': SANDSTONE, yellowish brown, moist, very dense, fine grained	
-25	40			S-2	38 50/4"					
-30	45			R-3	22 50/6"				@50': interbedded layer of clay	
-35	50			S-3	40 50/3"					
-40	55								**Notes:** Total Depth: 51.5 feet Groundwater encountered at 8 feet during drilling Boring backfilled with cuttings.	
-45	60									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
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APPENDIX B

CPT LOGS

Leighton

SUMMARY

OF

CONE PENETRATION TEST DATA

Project:

La Salina Sewer Lift Station Design & Wastewater Treatment Plant
1330 Tait Street
Oceanside, CA
April 8, 2016

Prepared for:

Mr. Sreekar Pulijala
Leighton Consulting
17781 Cowan
Irvine, CA 92614
Office (949) 250-1421 / Fax (949) 250-1114

Prepared by:



KEHOE TESTING & ENGINEERING
5415 Industrial Drive
Huntington Beach, CA 92649-1518
Office (714) 901-7270 / Fax (714) 901-7289
www.kehoetesting.com

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1. **INTRODUCTION**

2. **SUMMARY OF FIELD WORK**

3. **FIELD EQUIPMENT & PROCEDURES**

4. **CONE PENETRATION TEST DATA & INTERPRETATION**

APPENDIX

- CPT Plots
- CPT Classification/Soil Behavior Chart
- Interpretation Output (CPeT-IT)
- CPeT-IT Calculation Formulas

SUMMARY

OF

CONE PENETRATION TEST DATA

1. INTRODUCTION

This report presents the results of a Cone Penetration Test (CPT) program carried out for the La Salina Sewer Lift Station Design & Wastewater Treatment Plant project located at 1330 Tait Street in Oceanside, California. The work was performed by Kehoe Testing & Engineering (KTE) on April 8, 2016. The scope of work was performed as directed by Leighton Consulting personnel.

2. SUMMARY OF FIELD WORK

The fieldwork consisted of performing CPT soundings at four locations to determine the soil lithology. Groundwater measurements and hole collapse depths provided in **TABLE 2.1** are for information only. The readings indicate the apparent depth to which the hole is open and the apparent water level (if encountered) in the CPT probe hole at the time of measurement upon completion of the CPT. KTE does not warranty the accuracy of the measurements and the reported water levels may not represent the true or stabilized groundwater levels.

LOCATION	DEPTH OF CPT (ft)	COMMENTS/NOTES:
CPT-1	9	Refusal, hole open to 3 ft (dry)
CPT-1B	76	Refusal, groundwater @ 7 ft
CPT-2	3	Refusal, hole caved @ surface
CPT-2B	30	Refusal, groundwater @ 8 ft

TABLE 2.1 - Summary of CPT Soundings

3. FIELD EQUIPMENT & PROCEDURES

The CPT soundings were carried out by **KTE** using an integrated electronic cone system manufactured by Vertek. The CPT soundings were performed in accordance with ASTM standards (D5778). The cone penetrometers were pushed using a 30-ton CPT rig. The cone used during the program was a 15 cm^2 cone and recorded the following parameters at approximately 2.5 cm depth intervals:

- Cone Resistance (qc)
- Sleeve Friction (fs)
- Dynamic Pore Pressure (u)
- Inclination
- Penetration Speed

The above parameters were recorded and viewed in real time using a laptop computer. Data is stored at the KTE office for future analysis and reference. A complete set of baseline readings was taken prior to each sounding to determine temperature shifts and any zero load offsets. Monitoring base line readings ensures that the cone electronics are operating properly.

4. CONE PENETRATION TEST DATA & INTERPRETATION

The Cone Penetration Test data is presented in graphical form in the attached Appendix. These plots were generated using the CPeT-IT program. Penetration depths are referenced to ground surface. The soil classification on the CPT plots is derived from the attached CPT Classification Chart (Robertson) and presents major soil lithologic changes. The stratigraphic interpretation is based on relationships between cone resistance (qc), sleeve friction (fs), and penetration pore pressure (u). The friction ratio (Rf), which is sleeve friction divided by cone resistance, is a calculated parameter that is used along with cone resistance to infer soil behavior type. Generally, cohesive soils (clays) have high friction ratios, low cone resistance and generate excess pore water pressures. Cohesionless soils (sands) have lower friction ratios, high cone bearing and generate little (or negative) excess pore water pressures.

Tables of basic CPT output from the interpretation program CPeT-IT are provided for CPT data averaged over one foot intervals in the Appendix. Spreadsheet files of the averaged basic CPT output and averaged estimated geotechnical parameters are also included for use in further geotechnical analysis. We recommend a geotechnical engineer review the assumed input parameters and the calculated output from the CPeT-IT program. A summary of the equations used for the tabulated parameters is provided in the Appendix.

It should be noted that it is not always possible to clearly identify a soil type based on qc, fs and u. In these situations, experience, judgement and an assessment of the pore pressure data should be used to infer the soil behavior type.

If you have any questions regarding this information, please do not hesitate to call our office at (714) 901-7270.

Sincerely,

KEHOE TESTING & ENGINEERING



Richard W. Koester, Jr.
General Manager

04/11/16-kk-7113

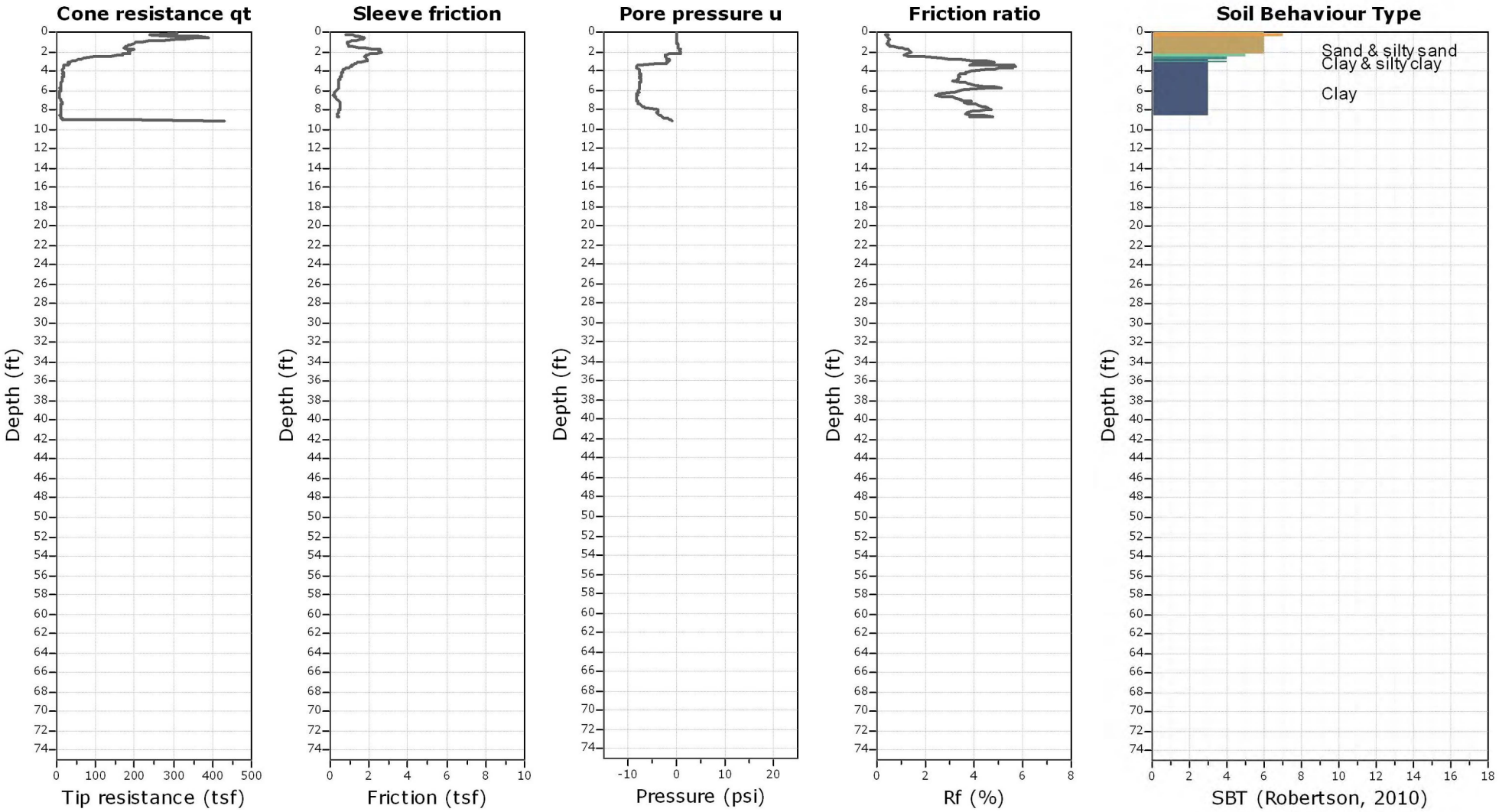
APPENDIX

Kehoe Testing and Engineering
714-901-7270
rich@kehoetesting.com
www.kehoetesting.com

CPT: CPT-1

Project: **Leighton Consulting/La Salina Sewer Lift Station Design & Wastewater Treatment Plant**
Location: **1330 Tait St Oceanside, CA**

Total depth: 9.15 ft, Date: 4/8/2016
Cone Type: Vertek



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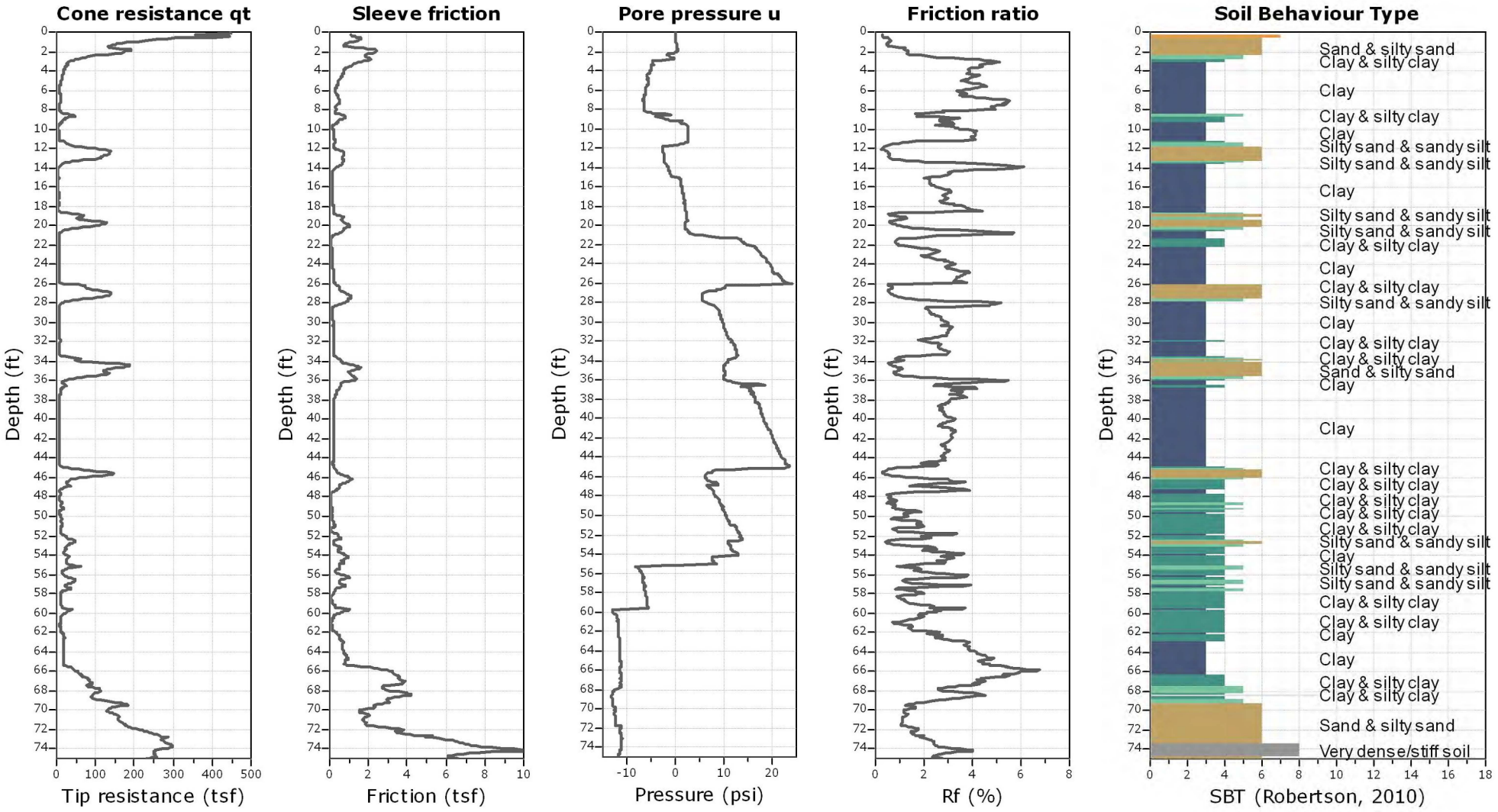
714-901-7270
rich@kehoetesting.com
www.kehoetesting.com

CPT: CPT-1B

Project: **Leighton Consulting/La Salina Sewer Lift Station Design & Wastewater Treatment Plant**
Total depth: 75.82 ft, Date: 4/8/2016

Location: **1330 Tait St Oceanside, CA**
Cone Type: Vertek



Kehoe Testing and Engineering
714-901-7270
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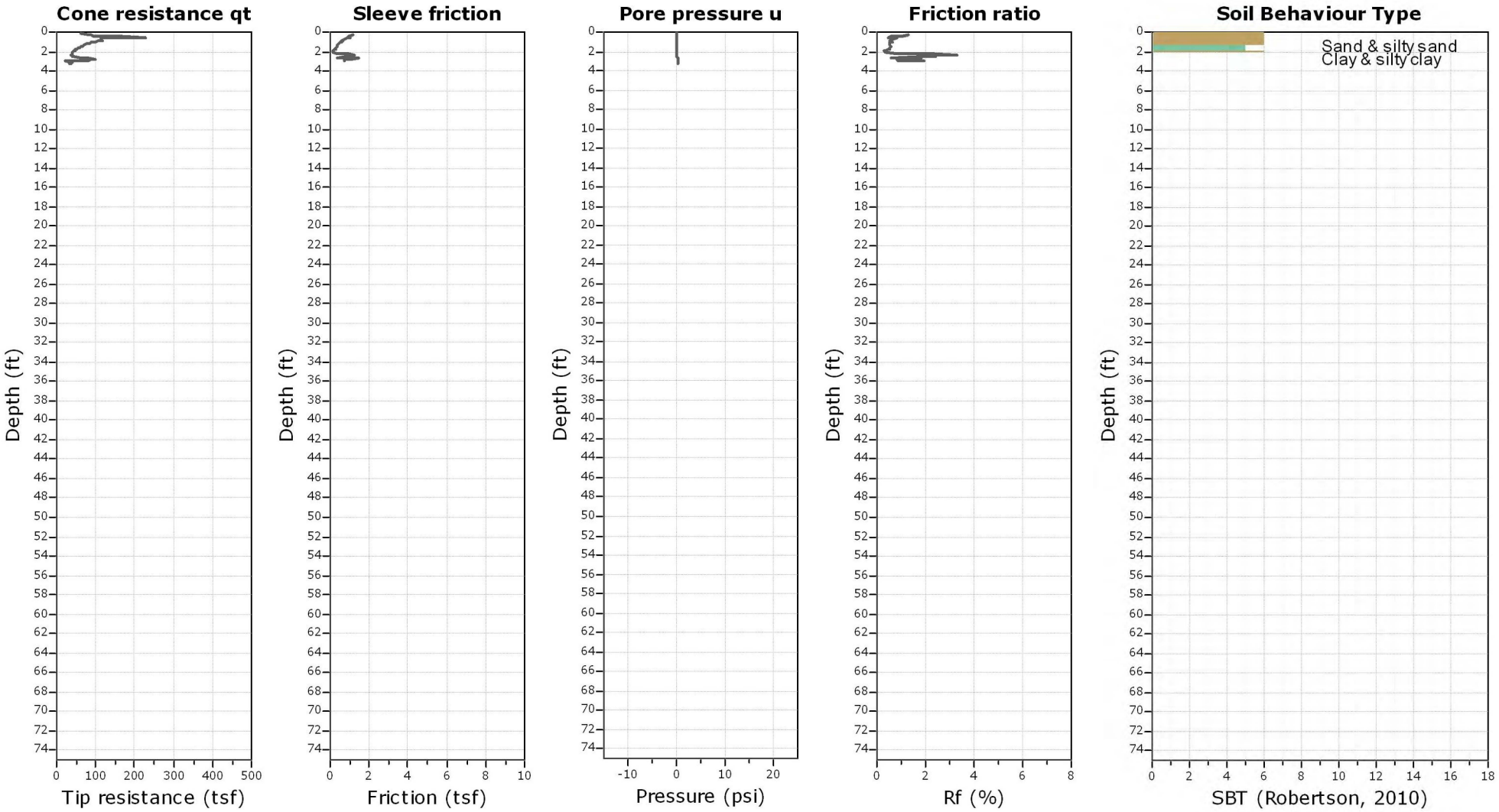
www.kehoetesting.com

CPT: CPT-2

Project: **Leighton Consulting/La Salina Sewer Lift Station Design & Wastewater Treatment Plant**
Location: **1330 Tait St Oceanside, CA**

Total depth: 3.32 ft, Date: 4/8/2016
Cone Type: Vertek

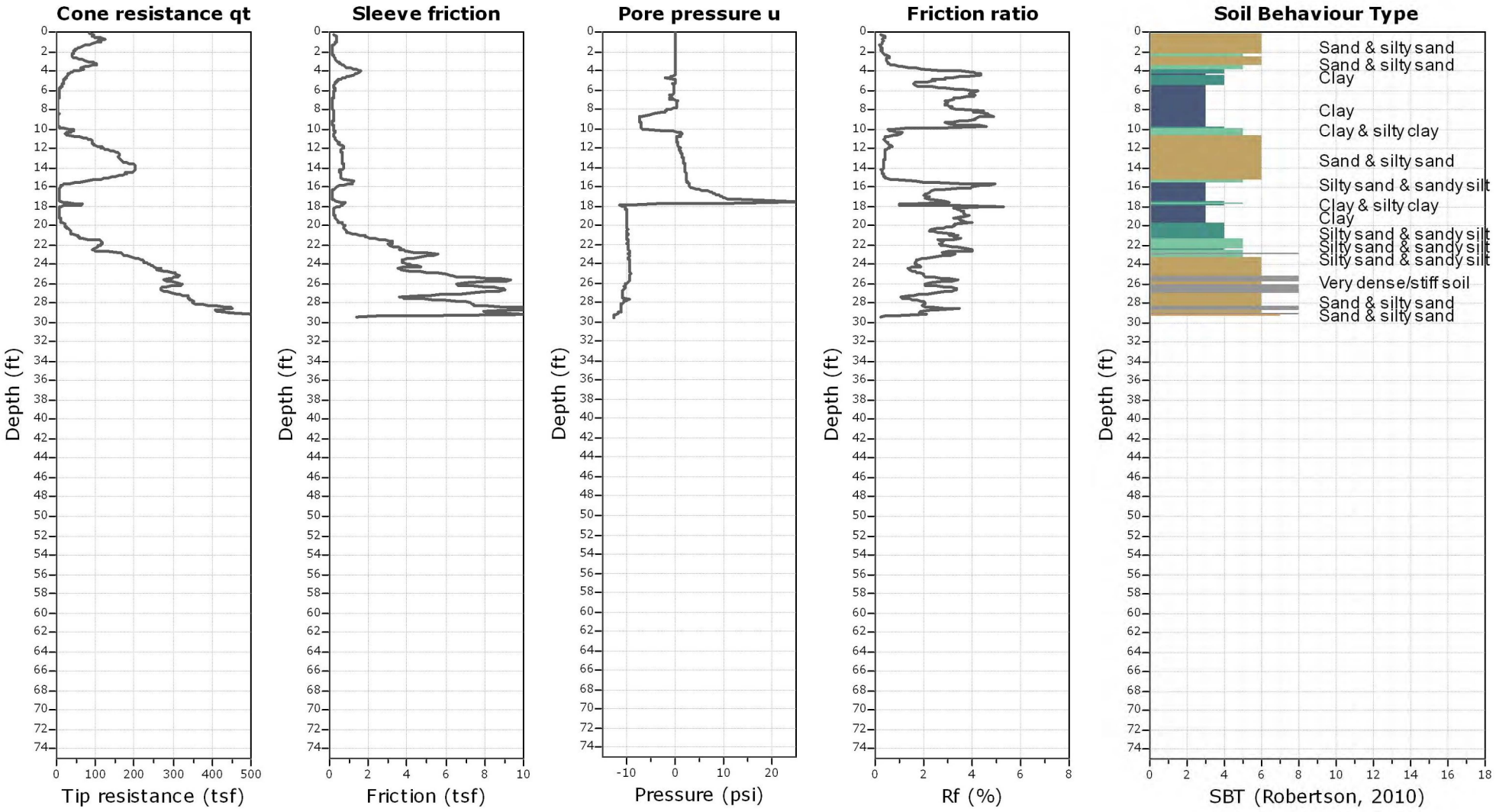


Kehoe Testing and Engineering
714-901-7270
rich@kehoetesting.com
www.kehoetesting.com

CPT: CPT-2B

Project: **Leighton Consulting/La Salina Sewer Lift Station Design & Wastewater Treatment Plant**
Total depth: 29.55 ft, Date: 4/8/2016

Location: **1330 Tait St Oceanside, CA**
Cone Type: Vertek



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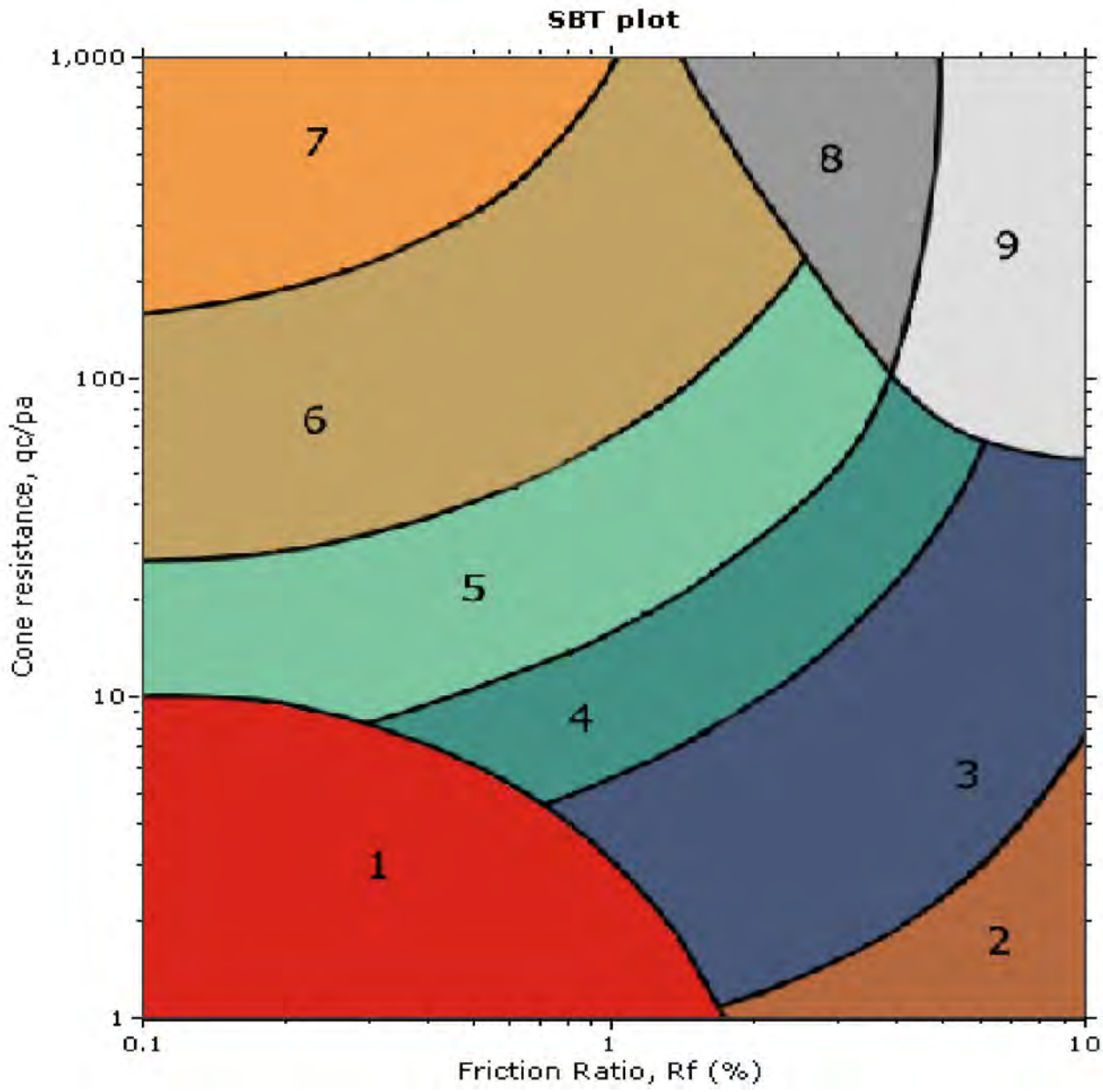

	CPT-1	In situ data			Basic output data														
Depth (ft)	qc (tsf)	fs (tsf)	u (psi)	Other	qt (tsf)	Rf(%)	SBT	Ic SBT	ã (pcf)	ó,v (tsf)	u0 (tsf)	ó',vo (tsf)	Qt1	Fr (%)	Bq	SBTn	n	Cn	Ic	Qtn
1	215.1	0.99	0.11	-2.37	215.101	0.4603	6	1.45933	123.2979	0.06165	0	0.0617	3488.1	0.4604	4E-05	7	0.3025	2.3631	1.1839	480.2593
2	186.2	2.62	0.9	-2.04	186.211	1.407	6	1.83622	130.0673	0.12668	0	0.1267	1468.9	1.408	0.0004	6	0.4605	2.6577	1.5854	467.388
3	38.2	1.77	-1.66	-1.97	38.1797	4.636	4	2.68625	123.3328	0.18835	0	0.1884	201.71	4.659	-0.003	9	0.7436	3.6091	2.3256	129.5841
4	16.5	0.65	-7.56	-2.01	16.4075	3.9616	3	2.9156	113.943	0.24532	0	0.2453	65.882	4.0217	-0.034	4	0.8268	3.3485	2.5358	51.14613
5	13.7	0.44	-7.22	-2.01	13.6116	3.2325	3	2.9264	110.6323	0.30064	0	0.3006	44.276	3.3055	-0.039	4	0.8471	2.9034	2.5813	36.52456
6	9.4	0.33	-7.9	-2.01	9.3033	3.5471	3	3.08425	107.5991	0.35444	0	0.3544	25.248	3.6876	-0.064	4	0.9189	2.7318	2.7621	23.10398
7	11.5	0.41	-8.26	-1.99	11.3989	3.5968	3	3.01598	109.6829	0.40928	0	0.4093	26.851	3.7308	-0.054	4	0.9141	2.3828	2.7427	24.74824
8	10.3	0.47	-3.79	-1.89	10.2536	4.5838	3	3.11569	110.4239	0.46449	0	0.4645	21.075	4.8013	-0.028	3	0.968	2.2188	2.8759	20.52752
9	14.4	0	-1.58	-1.9	14.3807	0	0	0	120.9	0.52494	0.0312	0.4937	28.063	0	-0.01	0	1	2.1431	0	0

	CPT-1B	In situ data			Basic output data														
Depth (ft)	qc (tsf)	fs (tsf)	u (psi)	Other	qt (tsf)	Rf(%)	SBT	Ic SBT	ã (pcf)	ó,v (tsf)	u0 (tsf)	ó',vo (tsf)	Qt1	Fr (%)	Bq	SBTn	n	Cn	Ic	Qtn
1	196.1	1.08	0.2	-2.02	196.102	0.5507	6	1.53894	123.7091	0.06185	0	0.0619	3169.4	0.5509	7E-05	7	0.3277	2.5357	1.2492	469.8047
2	175.8	2.36	0.47	-1.73	175.806	1.3424	6	1.83794	129.1623	0.12644	0	0.1264	1389.5	1.3434	0.0002	6	0.459	2.6515	1.5813	440.2377
3	37.1	1.77	-4.65	-1.68	37.0431	4.7782	4	2.70481	123.2591	0.18807	0	0.1881	195.97	4.8026	-0.009	9	0.7496	3.6503	2.3411	127.145
4	19.4	0.75	-5.14	-1.78	19.3371	3.8786	3	2.85432	115.3908	0.24576	0	0.2458	77.683	3.9285	-0.019	4	0.8082	3.2541	2.4871	58.71245
5	12.9	0.46	-5.71	-1.8	12.8301	3.5853	3	2.97378	110.8133	0.30117	0	0.3012	41.601	3.6715	-0.033	4	0.8639	2.9611	2.6253	35.06183
6	8.4	0.29	-6.32	-1.82	8.32264	3.4845	3	3.11961	106.382	0.35436	0	0.3544	22.487	3.6394	-0.057	4	0.9306	2.7675	2.7927	20.84146
7	9.8	0.52	-6.6	-1.85	9.71922	5.3502	3	3.17501	111.0331	0.40987	0	0.4099	22.713	5.5858	-0.051	3	0.973	2.5163	2.8956	22.13827
8	7.2	0.31	-6.49	-1.83	7.12056	4.3536	3	3.23041	106.4895	0.46312	0.0312	0.4319	15.414	4.6564	-0.075	3	0.9989	2.4473	2.9622	15.39822
9	20.9	0.66	-2.19	-1.9	20.8732	3.162	4	2.77284	114.6418	0.52044	0.0624	0.458	44.434	3.2428	-0.011	4	0.8448	2.0285	2.5546	39.01807
10	5.1	0.18	2.56	-1.87	5.13133	3.5079	3	3.29662	101.7128	0.5713	0.0936	0.4777	9.5459	3.9473	0.0199	3	1	2.215	3.0822	9.54588
11	6.1	0.24	2.58	-1.81	6.13158	3.9142	3	3.2578	104.2522	0.62342	0.1248	0.4986	11.047	4.3572	0.0111	3	1	2.1221	3.0571	11.04673
12	94.1	0.31	-2.7	-1.8	94.067	0.3296	6	1.69064	112.7846	0.67982	0.156	0.5238	178.28	0.332	-0.004	6	0.4711	1.3927	1.5668	122.9129
13	113.6	0.63	-2.25	-1.76	113.572	0.5547	6	1.73231	118.4331	0.73903	0.1872	0.5518	204.47	0.5584	-0.003	6	0.4938	1.3791	1.6222	147.0644
14	6	0.35	-1.52	-1.75	5.9814	5.8515	3	3.36679	106.9523	0.79251	0.2184	0.5741	9.0382	6.7452	-0.063	3	1	1.8431	3.2432	9.03817
15	5.5	0.12	0.18	-1.66	5.5022	2.1809	3	3.16447	98.91625	0.84197	0.2496	0.5924	7.8672	2.575	-0.051	3	1	1.7862	3.0473	7.86716
16	5.2	0.13	1.3	-1.6	5.21591	2.4924	3	3.21345	99.3716	0.89165	0.2808	0.6109	7.0791	3.0063	-0.043	3	1	1.7322	3.1222	7.07906
17	5.6	0.16	1.7	-1.58	5.62081	2.8466	3	3.21511	101.0732	0.94219	0.312	0.6302	7.4242	3.4198	-0.041	3	1	1.679	3.1358	7.42416
18	5.4	0.19	1.92	-1.58	5.4235	3.5033	3	3.27603	102.2435	0.99331	0.3432	0.6501	6.8145	4.2888	-0.046	3	1	1.6276	3.2222	6.81452
19	69.7	0.57	2.32	-1.59	69.7284	0.8175	6	2.00217	116.5109	1.05157	0.3744	0.6772	101.42	0.83	-0.003	6	0.6115	1.3138	1.9148	85.27146
20	106.9	1.01	2.14	-1.59	106.926	0.9446	6	1.89106	121.7395	1.11244	0.4056	0.7068	149.7	0.9545	-0.002	6	0.5769	1.262	1.8203	126.2079
21	6.2	0.19	4.7	-1.57	6.25753	3.0363	3	3.19028	102.5924	1.16373	0.4368	0.7269	7.0073	3.73	-0.019	3	1	1.4556	3.1777	7.00726
22	6.2	0.06	14.64	-1.58	6.37919	0.9406	4	2.94262	94.20521	1.21083	0.468	0.7428	6.9576	1.1609	0.1134	4	0.9995	1.4242	2.9249	6.9563
23	6.4	0.14	17.65	-1.57	6.61604	2.1161	3	3.08846	100.4938	1.26108	0.4992	0.7619	7.0286	2.6144	0.1441	3	1	1.3888	3.0922	7.0286
24	5.2	0.18	19.42	-1.58	5.4377	3.3102	3	3.26187	101.8543	1.31201	0.5304	0.7816	5.2785	4.3629	0.2104	3	1	1.3538	3.3178	5.27846
25	5.5	0.21	20.72	-1.56	5.75361	3.6499	3	3.26412	103.1199	1.36357	0.5616	0.802	5.4741	4.7836	0.2119	3	1	1.3194	3.3273	5.47409
26	17.1	0.26	23.45	-1.54	17.387	1.4954	4	2.65089	107.3799	1.41726	0.5928	0.8245	19.37	1.6281	0.0686	4	0.8876	1.2479	2.6207	18.83422
27	140.9	0.9	5.71	-1.52	140.97	0.6384	6	1.69144	121.5699	1.47804	0.624	0.854	163.33	0.6452	-0.002	6	0.5226	1.1185	1.6595	147.4507
28	13.4	0.69	6.41	-1.52	13.4785	5.1193	3	3.05197	113.9003	1.53499	0.6552	0.8798	13.575	5.7772	-0.016	3	1	1.2027	3.0643	13.57531
29	6.9	0.16	9.07	-1.52	7.01102	2.2821	3	3.08335	101.6123	1.5858	0.6864	0.8994	6.032	2.9492	-0.006	3	1	1.1765	3.1763	6.03204
30	6.4	0.2	9.63	-1.52	6.51787	3.0685	3	3.17778	103.0671	1.63733	0.7176	0.9197	5.3065	4.0979	-0.005	3	1	1.1505	3.3007	5.30647
31	7.2	0.22	10.5	-1.54	7.32852	3.002	3	3.12978	104.0504	1.68936	0.7488	0.9406	5.9956	3.9013	0.0013	3	1	1.125	3.2447	5.99555
32	8.8	0.19	11.62	-1.56	8.94223	2.1248	3	2.97682	103.4631	1.74109	0.78	0.9611	7.4927	2.6385	0.0079	3	1	1.101	3.0708	7.49268
33	6.7	0.21	12.52	-1.54	6.85324	3.0642	3	3.15909	103.5465	1.79286	0.8112	0.9817	5.1549	4.1499	0.0178	3	1	1.0779	3.3142	5.15491
34	58.9	0.59	10.94	-1.52	59.0339	0.9994	5	2.1114	116.3572	1.85104	0.8424	1.0086	56.693	1.0318	-1E-03	5	0.7049	1.0343	2.1188	55.89762
35	120	1.04	9.99	-1.42	120.122	0.8658	6	1.82799	122.2375	1.91216	0.8736	1.0386	113.82	0.8798	-0.001	6	0.5979	1.0112	1.8341	112.9708
36	21.3	1.17	10.33	-1.4	21.4264	5.4605	3	2.91751	118.8948	1.97161	0.9048	1.0668	18.236	6.0139	-0.008	3	1	0.9918	2.9794	18.23649
37	11.3	0.37	15.43	-1.37	11.4889	3.2205	3	2.98518	108.9509	2.02608	0.936	1.0901	8.6808	3.9101	0.0185	3	1	0.9707	3.1132	8.68079
38	7.4	0.23	16.46	-1.35	7.60147	3.0257	3	3.11832	104.4649	2.07832	0.9672	1.1111	4.9708	4.1643	0.0395	3	1	0.9523	3.3282	4.97082
39	7.7	0.2	17.53	-1.33	7.91457	2.527	3	3.06147	103.5407	2.13009	0.9984	1.1317	5.1114	3.4575	0.0456	3	1	0.935	3.274	5.11138
40	7.4	0.25	18.18	-1.33	7.62252	3.2798	3	3.13655	105.0817	2.18263	1.0296	1.153	4.7179	4.5957	0.0514	3	1	0.9177	3.3708	4.71793
41	6.7	0.22	18.97	-1.31	6.93219	3.1736	3	3.16317	103.9148	2.23458	1.0608	1.1738	4.0021	4.6832	0.0649	3	1	0.9015	3.4348	4.0021
42	7.1	0.23	20.15	-1.29	7.34664	3.1307	3	3.13881	104.3817	2.28678	1.092	1.1948	4.235	4.5456	0.0709	3	1	0.8856	3.4072	4.23499
43	7.4	0.22	21.02	-1.27	7.65728	2.8731	3	3.10344	104.1575	2.33885	1.1232	1.2157	4.375	4.1366	0.0734	3	1	0.8704	3.3729	4.37495
44	7.1	0.2	21.79	-1.25	7.36671	2.7149	3	3.10441	103.3657	2.39054	1.1544	1.2361	4.0256	4.0192	0.0833	3	1	0.856	3.3966	4.02558
45	29.7	0.25	23.3	-1.21	29.9852	0.8337	5	2.31792	108.4222	2.44475	1.1856	1.2592	21.872	0.9078	0.0179	5	0.8328	0.8651	2.4231	22.5178
46	71.8	1	6.28	-1.21	71.8769	1.3913	5	2.13114	120.698	2.5051	1.2168	1.2883	53.848	1.4415	-0.011	5	0.7502	0.8627	2.2025	56.56182
47	24.7	0.55	6.53	-1.17	24.7799	2.2195	4	2.62011	113.7263	2.56196	1.248	1.314	16.909	2.4755	-0.035	4	0.9635	0.8117	2.7594	17.04348
48	7.3	0.05	8.23	-1.15	7.40074	0.6756	4	2.82734	93.23345	2.60858	1.2792	1.3294	3.6048	1.0434	-0.143	3	1	0.7959	3.1654	3.60482
49	11.6	0.09	9.55	-1.2	11.7169	0.7681	4	2.66572	98.65488	2.6579	1.3104	1.3475	6.7228	0.9935	-0.069	4	1	0.7852	2.9093	6.72279
50	10.3	0.13	10.47	-1.16	10.4282	1.2466	4	2.80416	101.0613	2.70843	1.3416	1.3668	5.6479	1.684	-0.076	3	1	0.7741	3.079	5.64788
51	12.6	0.25	11.83	-1.19	12.7448	1.9616	4	2.82776	106.3354	2.7616	1.3728	1.3888	7.1884	2.5042	-0.052	3	1	0.7619	3.0741	7.18835
52	19.2	0.35	13.38	-1.19	19.3638	1.8075	4	2.65612	109.8176	2.81651	1.404	1.4125	11.715	2.1152	-0.027	4	1	0.7491	2.8556	11.71478
53	29.3	0.28	11.13	-1.19	29.4362	0.9512	5	2.35353	109.2063	2.87111	1.4352	1.4359	18.5	1.054	-0.024	5	0.8763	0.7653	2.515	19.21267
54	24.8	0.81	12.94	-1.23	24.9584	3.2454	4	2.71956	116.5763	2.9294	1.4664	1.463	15.057	3.677	-0.024	3	1	0.7232	2.9056	15.05738
55	36.1	0.5	8.46	-1.31	36.2036	1.3811	5	2.36589	113.9536	2.98638	1.4976	1.4888	22.312	1.5053	-0.027	5	0.883	0.7397	2.526	23.22113
56	16.4	0.51	-6.87	-1.25	16.3159	3.1258	3	2.85451	112.1545	3.04246	1.5288	1.5137	8.7691	3.8423	-0.152	3	1	0.699	3.1052	8.76913
57	28.5	0.62	-6.58	-1.27	28.4195	2.1816	4	2.5681	114.9371	3.09993	1.56	1.5399	16.442	2.4487	-0.08	4	0.9768	0.6931	2.7663	16.58595
58	10.7	0.19	-6.07	-1.25	10.6257	1.7881	4	2.87399	103.8838	3.15187	1.5912	1.5607	4.7889	2.5422	-0.271	3	1	0.678	3.2286	4.78887
59	10.9	0.15	-5.87	-1.21	10.8282	1.3853	4	2.81163	102.2002	3.20297	1.6224	1.5806	4.8243	1.9672	-0.268	3	1	0.6695	3.1712	4.82433
60	25.2	0.55	-13.01	-1.13	25.0408	2.1964	4	2.61375	113.7518	3.25984	1.6536	1.6062	13.56	2.5252	-0.119	4	1	0.6588	2.8455	13.56016
61	9.9	0.06	-11.87	-1.12	9.75471	0.6151	4	2.70084	95.24108	3.30746	1.6848	1.6227	3.9733	0.9306	-0.394	3	1	0.6521	3.1073	3.97325
62	13.5	0.35	-11.6	-1.15	13.358	2.6202	3	2.88015	108.912	3.36192	1.716	1.6459	6.0733	3.5014	-0.255	3	1	0.6429	3.2141	6.07326
63	18.4	0.7	-11.51	-1.13	18.2591	3.8337	3	2.87046	114.746	3.41929	1.7472	1.6721	8.875	4.717	-0.174	3	1	0.6328	3.1537	8.875
64	18.6	0.75	-11.43	-1.11	18.4601	4.0628	3	2.88269	115.2776	3.47693	1.7784	1.6985	8.8213	5.0056	-0.174	3	1	0.623	3.1713	8.82125
65	18.2	0.79	-11.34	-1.05	18.0612	4.374	3	2.91042	115.6045	3.53473	1.8096	1.7251	8.4205	5.4384	-0.181	3	1	0.6134	3.2092	8.42049
66	51.2	3.17	-11.34	-1.2	51.0612	6.2082	3	2.69136	128.3058	3.59889	1.8408	1.7581	26.997	6.679	-0.056	3	1	0.6019	2.8874	26.99657
67	86.1	3.85	-11.25	-1.51	85.9623	4.4787	4	2.43629	130.9983	3.66439	1.872	1.7924	45.915	4.6781	-0.033	4	0.9271	0.6135	2.6041	47.71364
68	113.4	3.16	-12.52	-1.79	113.247	2.7904	5	2.20215	130.2255	3.7295	1.9032	1.8263	59.967	2.8854	-0.026	5	0.8349	0.634	2.357	65.62019

69	114.2	2.92	-12.92	-1.97	114.042	2.5605	5	2.17203	129.6646	3.79433	1.9344	1.8599	59.275	2.6486	-0.026	5	0.8263	0.6274	2.3318	65.37514
70	129.9	1.47	-12.4	-1.97	129.748	1.133	6	1.87935	124.9575	3.85681	1.9656	1.8912	66.567	1.1677	-0.023	6	0.7144	0.6604	2.0339	78.57513
71	157	1.67	-12.4	-1.97	156.848	1.0647	6	1.80087	126.3535	3.91999	1.9968	1.9232	79.518	1.092	-0.019	6	0.6833	0.6648	1.9482	96.08576
72	213	3.79	-11.25	-2.15	212.862	1.7805	6	1.87698	133.0949	3.98653	2.028	1.9585	106.65	1.8145	-0.014	5	0.7092	0.6462	2.012	127.5612
73	270.1	5.92	-11.16	-2.37	269.963	2.1929	6	1.88871	136.9376	4.055	2.0592	1.9958	133.23	2.2263	-0.011	5	0.7121	0.6364	2.015	159.9395
74	273.6	9.43	-11.25	-2.74	273.462	3.4484	8	2.05129	137.28	4.12364	2.0904	2.0332	132.47	3.5012	-0.011	8	0.7777	0.6017	2.1825	153.1718
75	235.6	6.01	-11.78	-2.94	235.456	2.5525	5	1.97669	136.7145	4.192	2.1216	2.0704	111.7	2.5988	-0.013	5	0.7559	0.6021	2.1206	131.5896

	CPT-2	In situ data						Basic output data											
Depth (ft)	qc (tsf)	fs (tsf)	u (psi)	Other	qt (tsf)	Rf(%)	SBT	Ic SBT	ã (pcf)	ó,v (tsf)	u0 (tsf)	ó',vo (tsf)	Qt1	Fr (%)	Bq	SBTn	n	Cn	Ic	Qtn
1	95.4	0.6	-0.07	0.48	95.3991	0.6289	6	1.82558	117.6508	0.05883	0	0.0588	1620.7	0.6293	-5E-05	6	0.3982	3.1607	1.4385	284.7919
2	43.6	0.14	-0.07	0.44	43.5991	0.3211	6	1.99229	105.0926	0.11137	0	0.1114	390.47	0.3219	-1E-04	6	0.4569	2.7973	1.5862	114.9664
3	28.9	0	0.46	-0.72	28.9056	0	0	0	120.9	0.17182	0	0.1718	167.23	0	0.0012	0	1	6.1582	0	0

	CPT-2B	In situ data			Basic output data														
Depth (ft)	qc (tsf)	fs (tsf)	u (psi)	Other	qt (tsf)	Rf(%)	SBT	Ic SBT	ã (pcf)	ó,v (tsf)	u0 (tsf)	ó',vo (tsf)	Qt1	Fr (%)	Bq	SBTn	n	Cn	Ic	Qtn
1	111.8	0.35	-0.14	-0.83	111.798	0.3131	6	1.61348	114.0938	0.05705	0	0.0571	1958.8	0.3132	-9E-05	7	0.3319	2.636	1.2505	278.3695
2	45	0.11	0.12	-0.78	45.0015	0.2444	6	1.93914	103.4053	0.10875	0	0.1088	412.81	0.245	0.0002	6	0.4406	2.7246	1.5333	115.5985
3	79.1	0.39	0	-0.93	79.1	0.4931	6	1.83894	114.0418	0.16577	0	0.1658	476.17	0.4941	0	6	0.4464	2.2877	1.5386	170.658
4	48.7	1.57	0.04	-1.11	48.7005	3.2238	4	2.5005	123.0491	0.22729	0	0.2273	213.26	3.2389	6E-05	5	0.6945	2.91	2.1917	133.3098
5	17.3	0.36	-0.05	-1.19	17.2994	2.081	4	2.73095	109.7487	0.28217	0	0.2822	60.309	2.1155	-2E-04	5	0.772	2.7741	2.388	44.61462
6	7.1	0.27	-0.29	-1.29	7.09645	3.8047	3	3.19831	105.4704	0.3349	0	0.3349	20.189	3.9932	-0.003	3	0.9519	2.9895	2.8475	19.10349
7	4.6	0.14	-0.18	-1.31	4.5978	3.0449	3	3.30489	99.6062	0.38471	0	0.3847	10.951	3.323	-0.003	3	1	2.7504	2.9901	10.95141
8	4.5	0.15	-1.39	-1.37	4.48299	3.346	3	3.33554	100.0493	0.43473	0	0.4347	9.3121	3.7053	-0.025	3	1	2.4339	3.0748	9.31206
9	5.2	0.21	-7.19	-1.47	5.11199	4.108	3	3.33521	102.8316	0.48615	0.0312	0.455	10.168	4.5397	-0.119	3	1	2.3258	3.0965	10.16786
10	23.7	0.21	-6.88	-1.53	23.6158	0.8892	5	2.42211	106.564	0.53943	0.0624	0.477	48.375	0.91	-0.024	5	0.7185	1.7725	2.2215	38.65675
11	76.5	0.29	0.39	-1.61	76.5048	0.3791	6	1.79798	111.7926	0.59533	0.0936	0.5017	151.3	0.382	-9E-04	6	0.5046	1.4572	1.6577	104.5417
12	114.4	0.63	1.01	-1.57	114.412	0.5506	6	1.72787	118.451	0.65455	0.1248	0.5298	214.74	0.5538	-5E-04	6	0.4886	1.4021	1.6114	150.7454
13	160.1	0.65	1.53	-1.59	160.119	0.406	6	1.5332	119.4995	0.7143	0.156	0.5583	285.52	0.4078	-3E-04	6	0.424	1.3114	1.4383	197.5555
14	203	0.77	1.97	-1.65	203.024	0.3793	6	1.43082	121.3181	0.77496	0.1872	0.5878	344.1	0.3807	-2E-04	6	0.3923	1.2594	1.3512	240.7225
15	141.7	0.56	2.25	-1.66	141.728	0.3951	6	1.57191	118.1114	0.83402	0.2184	0.6156	228.87	0.3975	-4E-04	6	0.4454	1.2728	1.487	169.4813
16	9.3	0.37	3.14	-1.78	9.33843	3.9621	3	3.11074	108.4455	0.88824	0.2496	0.6386	13.232	4.3786	-0.003	3	1	1.6568	2.9966	13.23156
17	7	0.14	9.42	-1.88	7.1153	1.9676	3	3.04531	100.6712	0.93857	0.2808	0.6578	9.3903	2.2666	0.0643	3	1	1.6086	2.9527	9.39034
18	9.9	0.51	-10.91	-2.92	9.76646	5.222	3	3.16689	110.9029	0.99403	0.312	0.682	12.862	5.8137	-0.125	3	1	1.5514	3.084	12.86231
19	7	0.26	-10	-3	6.8776	3.7804	3	3.208	105.1179	1.04659	0.3432	0.7034	8.2899	4.4589	-0.182	3	1	1.5043	3.1629	8.28993
20	23.7	0.77	-9.92	-2.96	23.5786	3.2657	4	2.74036	116.067	1.10462	0.3744	0.7302	30.777	3.4262	-0.048	4	0.898	1.3952	2.6594	29.6339
21	53.1	1.71	-9.79	-2.91	52.9802	3.2276	4	2.47455	123.8795	1.16656	0.4056	0.761	68.09	3.3003	-0.021	4	0.8034	1.3032	2.4073	63.81738
22	113.4	3	-9.74	-2.65	113.281	2.6483	5	2.18495	129.846	1.23148	0.4368	0.7947	141	2.6774	-0.01	5	0.7013	1.2224	2.1352	129.4434
23	171.8	5.43	-9.51	-2.53	171.684	3.1628	8	2.13207	135.2015	1.29908	0.468	0.8311	205.02	3.1869	-0.007	8	0.6876	1.1806	2.0949	190.1155
24	240.3	4.1	-9.39	-2.35	240.185	1.707	6	1.83029	133.9647	1.36606	0.4992	0.8669	275.5	1.7168	-0.005	6	0.5783	1.1222	1.8037	253.2858
25	306.6	6.1	-9.23	-2.15	306.487	1.9903	6	1.82302	137.28	1.4347	0.5304	0.9043	337.33	1.9997	-0.004	6	0.5802	1.0954	1.8043	315.8095
26	320.7	6.5	-10.19	-1.9	320.575	2.0276	6	1.81907	137.28	1.50334	0.5616	0.9417	338.81	2.0372	-0.004	6	0.5826	1.0702	1.806	322.7294
27	306.5	6.83	-10.97	-1.88	306.366	2.2294	6	1.86436	137.28	1.57198	0.5928	0.9792	311.27	2.2409	-0.005	6	0.6036	1.0479	1.8565	301.8544
28	353.8	7.39	-10.79	-1.86	353.668	2.0895	6	1.80736	137.28	1.64062	0.624	1.0166	346.27	2.0993	-0.004	6	0.5857	1.0237	1.8048	340.5802
29	447.6	8.13	-11.38	-1.8	447.461	1.8169	6	1.70305	137.28	1.70926	0.6552	1.0541	422.89	1.8239	-0.003	6	0.5494	1.0021	1.7049	422.1592

Presented below is a list of formulas used for the estimation of various soil properties. The formulas are presented in SI unit system and assume that all components are expressed in the same units.

:: Unit Weight, g (kN/m³) ::

$$g = g_w \cdot \left(0.27 \cdot \log(R_f) + 0.36 \cdot \log(\frac{q_t}{p_a}) + 1.236 \right)$$

where g_w = water unit weight

:: Permeability, k (m/s) ::

$I_c < 3.27$ and $I_c > 1.00$ then $k = 10^{0.952 - 3.04 \cdot I_c}$

$I_c \leq 4.00$ and $I_c > 3.27$ then $k = 10^{-4.52 - 1.37 \cdot I_c}$

:: N_{SPT} (blows per 30 cm) ::

$$N_{60} = \left(\frac{q_c}{P_a}\right) \cdot \frac{1}{10^{1.1268 - 0.2817 \cdot I_c}}$$

$$N_{1(60)} = Q_{tn} \cdot \frac{1}{10^{1.1268 - 0.2817 \cdot I_c}}$$

:: Young's Modulus, Es (MPa) ::

$(q_t - \sigma_v) \cdot 0.015 \cdot 10^{0.55 \cdot I_c + 1.68}$

(applicable only to $I_c < I_{c_cutoff}$)

:: Relative Density, Dr (%) ::

$100 \cdot \sqrt{\frac{Q_{tn}}{k_{DR}}}$ (applicable only to SBT_n: 5, 6, 7 and 8 or $I_c < I_{c_cutoff}$)

:: State Parameter, ψ ::

$\psi = 0.56 - 0.33 \cdot \log(Q_{tn,cs})$

:: Peak drained friction angle, φ (°) ::

$\varphi = 17.60 + 11 \cdot \log(Q_{tn})$

(applicable only to SBT_n: 5, 6, 7 and 8)

:: 1-D constrained modulus, M (MPa) ::

If $I_c > 2.20$

$\alpha = 14$ for $Q_{tn} > 14$

$\alpha = Q_{tn}$ for $Q_{tn} \leq 14$

$M_{CPT} = \alpha \cdot (q_t - \sigma_v)$

If $I_c \leq 2.20$

$M_{CPT} = (q_t - \sigma_v) \cdot 0.0188 \cdot 10^{0.55 \cdot I_c + 1.68}$

:: Small strain shear Modulus, Go (MPa) ::

$G_0 = (q_t - \sigma_v) \cdot 0.0188 \cdot 10^{0.55 \cdot I_c + 1.68}$

:: Shear Wave Velocity, Vs (m/s) ::

$$V_s = \left(\frac{G_0}{\rho}\right)^{0.50}$$

:: Undrained peak shear strength, Su (kPa) ::

$N_{kt} = 10.50 + 7 \cdot \log(F_r)$ or user defined

$$S_u = \frac{(q_t - \sigma_v)}{N_{kt}}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c_cutoff}$)

:: Remolded undrained shear strength, Su(rem) (kPa) ::

$S_{u(rem)} = f_s$ (applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c_cutoff}$)

:: Overconsolidation Ratio, OCR ::

$$k_{OCR} = \left[\frac{Q_{tn}^{0.20}}{0.25 \cdot (10.50 \cdot +7 \cdot \log(F_r))} \right]^{1.25}$$ or user defined

$OCR = k_{OCR} \cdot Q_{tn}$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c_cutoff}$)

:: In situ Stress Ratio, Ko ::

$K_O = (1 - \sin\varphi') \cdot OCR^{\sin\varphi'}$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c_cutoff}$)

:: Soil Sensitivity, S_t ::

$$S_t = \frac{N_S}{F_r}$$

(applicable only to SBT_n: 1, 2, 3, 4 and 9 or $I_c > I_{c_cutoff}$)

:: Effective Stress Friction Angle, φ' (°) ::

$\varphi' = 29.5° \cdot B_q^{0.121} \cdot (0.256 + 0.336 \cdot B_q + \log Q_t)$

(applicable for $0.10 < B_q < 1.00$)

References

- Robertson, P.K., Cabal K.L., Guide to Cone Penetration Testing for Geotechnical Engineering, Gregg Drilling & Testing, Inc., 5th Edition, November 2012
- Robertson, P.K., Interpretation of Cone Penetration Tests - a unified approach., Can. Geotech. J. 46(11): 1337–1355 (2009)

APPENDIX C

LABORATORY TEST RESULTS

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Boring No.	LB-1							
Sample No.	R-1							
Depth (ft.)	5.0							
Sample Type	Ring							
Soil Identification	Brown clayey sand with gravel (SC)g							
No Moisture Correction; ASTM D 1140 modified to include splitting the sample on the #4 sieve								
Total Sample Dry Weight Determination								
Dry Weight of Soil + Container (g)	1086.6							
Weight of Container (g)	140.6							
Dry Weight of Soil (g)	946.0							
Sample Dry Weight Determination, Retained on Sieve #4								
Dry Weight of Sample + Cont. (g)	221.3							
Weight of Container (g)	0.0							
Weight of Dry Sample (g)	221.3							
Sample Dry Weight Determination, Passing Sieve #4								
Dry Weight of Sample + Cont. (g)	481.4							
Weight of Container (g)	140.6							
Weight of Dry Sample (g)	340.8							
After Wash								
Method (A or B)	B							
Dry Weight of Sample + Cont. (g)	399.9							
Weight of Container (g)	140.6							
Weight of Dry Sample (g)	259.3							
% Passing No. 4 Sieve	76.6							
% Retained No. 4 Sieve	23.4							
% Passing No. 200 Sieve	**18.3**							

Leighton

PERCENT PASSING
No. 200 SIEVE
ASTM D 1140

Project Name: La Salina Lift Station
Project No.: 11224.001
Client Name: Tetra Tech, Inc.
Tested By: G. Bathala Date: 04/25/16

Boring No.	LB-1	LB-8						
Sample No.	R-3	R-1						
Depth (ft.)	25.0	25.0						
Sample Type	Ring	Ring						
Soil Identification	Gray sandy silt s(ML)	Reddish brown silty sand (SM)						
Moisture Correction								
Wet Weight of Soil + Container (g)	0.0	0.0						
Dry Weight of Soil + Container (g)	0.0	0.0						
Weight of Container (g)	1.0	1.0						
Moisture Content (%)	0.0	0.0						
Sample Dry Weight Determination								
Weight of Sample + Container (g)	675.4	871.5						
Weight of Container (g)	111.5	99.6						
Weight of Dry Sample (g)	563.9	771.9						
Container No.:								
After Wash								
Method (A or B)	B	B						
Dry Weight of Sample + Cont. (g)	324.8	712.6						
Weight of Container (g)	111.5	99.6						
Dry Weight of Sample (g)	213.3	613.0						
% Passing No. 200 Sieve	**62.2**	**20.6**						
% Retained No. 200 Sieve	37.8	79.4						

Leighton

PERCENT PASSING
No. 200 SIEVE
ASTM D 1140

Project Name: La Salina Lift Station
Project No.: 11224.001
Client Name: Tetra Tech, Inc.
Tested By: S. Felter Date: 04/19/16

ATTERBERG LIMITS

ASTM D 4318

Project Name:	La Salina Lift Station	Tested By:	S. Felter	Date:	04/25/16
Project No. :	11224.001	Input By:	J. Ward	Date:	05/04/16
Boring No.:	LB-1	Checked By:	J. Ward		
Sample No.:	R-2	Depth (ft.)	15.0		
Soil Identification:	Dark gray fat clay (CH)				

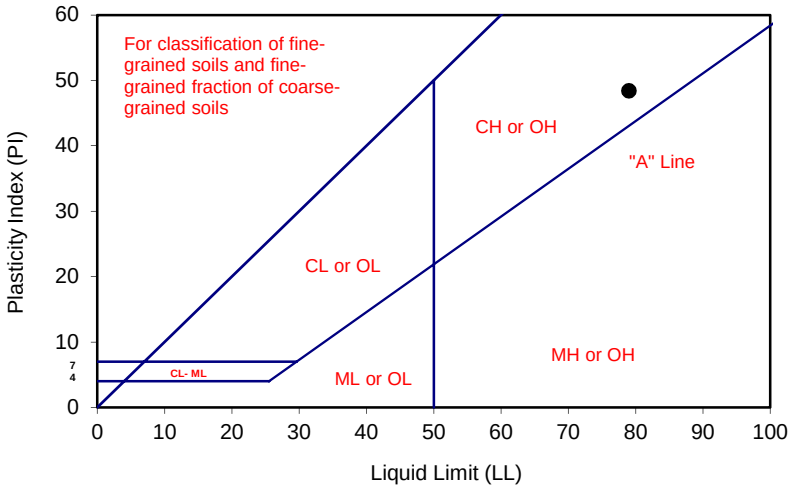
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			34	27	21	
Wet Wt. of Soil + Cont. (g)	23.87	23.61	36.36	35.03	34.84	
Dry Wt. of Soil + Cont. (g)	21.44	21.26	26.35	25.54	25.40	
Wt. of Container (g)	13.59	13.49	13.50	13.53	13.54	
Moisture Content (%) [Wn]	30.96	30.24	77.90	79.02	79.60	

Liquid Limit	**79**
Plastic Limit	**31**
Plasticity Index	**48**
Classification	**CH**

PI at "A" - Line = 0.73(LL-20) 43.07

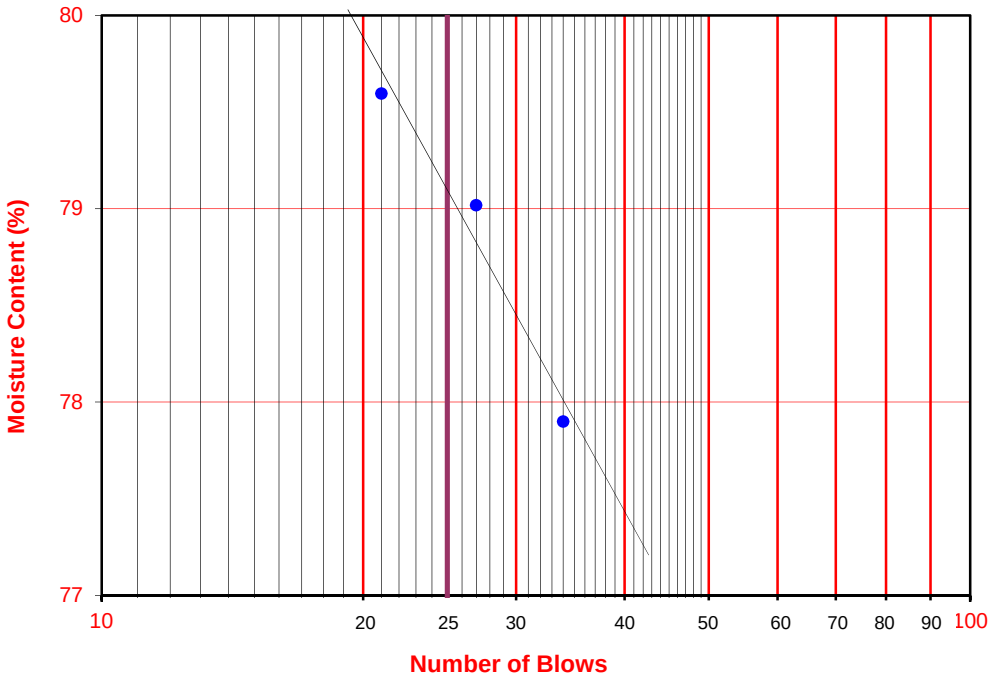
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



Leighton

ATTERBERG LIMITS

ASTM D 4318

Project Name:	La Salina Lift Station	Tested By:	S. Felter	Date:	04/22/16
Project No. :	11224.001	Input By:	J. Ward	Date:	05/04/16
Boring No.:	LB-1	Checked By:	J. Ward		
Sample No.:	S-3	Depth (ft.)	30.0		
Soil Identification:	Dark gray fat clay (CH)				

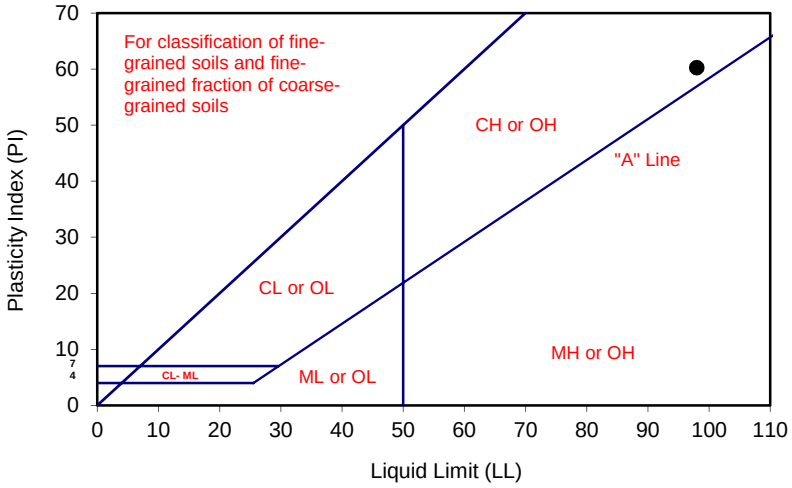
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			34	28	21	
Wet Wt. of Soil + Cont. (g)	23.93	24.03	34.79	37.50	34.51	
Dry Wt. of Soil + Cont. (g)	21.08	21.16	24.42	25.71	24.07	
Wt. of Container (g)	13.58	13.50	13.54	13.58	13.49	
Moisture Content (%) [Wn]	38.00	37.47	95.31	97.20	98.68	

Liquid Limit	**98**
Plastic Limit	**38**
Plasticity Index	**60**
Classification	**CH**

PI at "A" - Line = 0.73(LL-20) 56.94

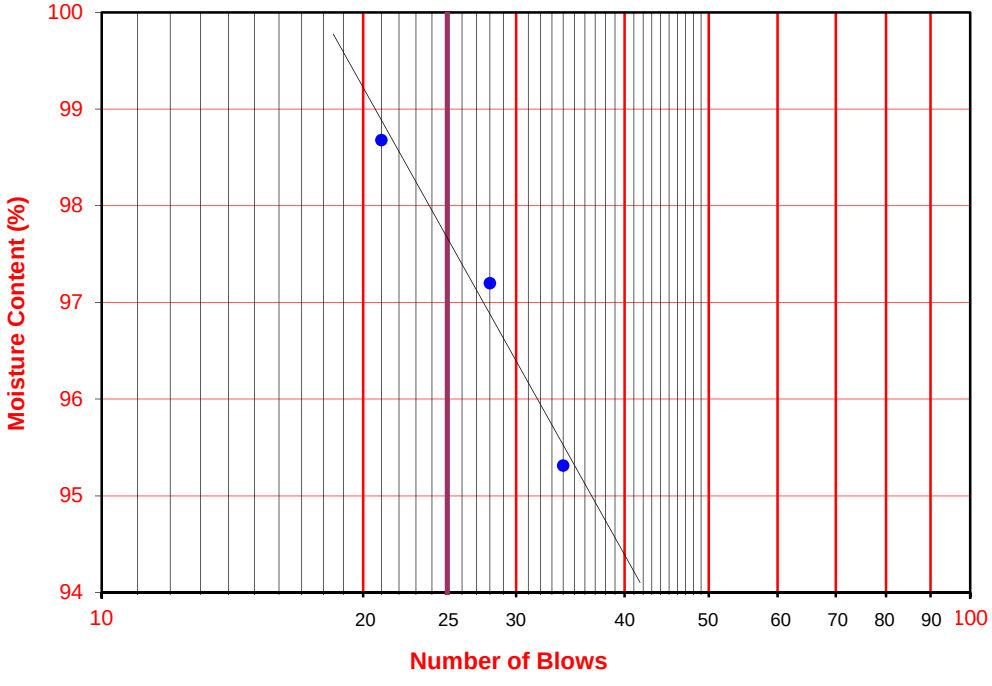
One - Point Liquid Limit Calculation

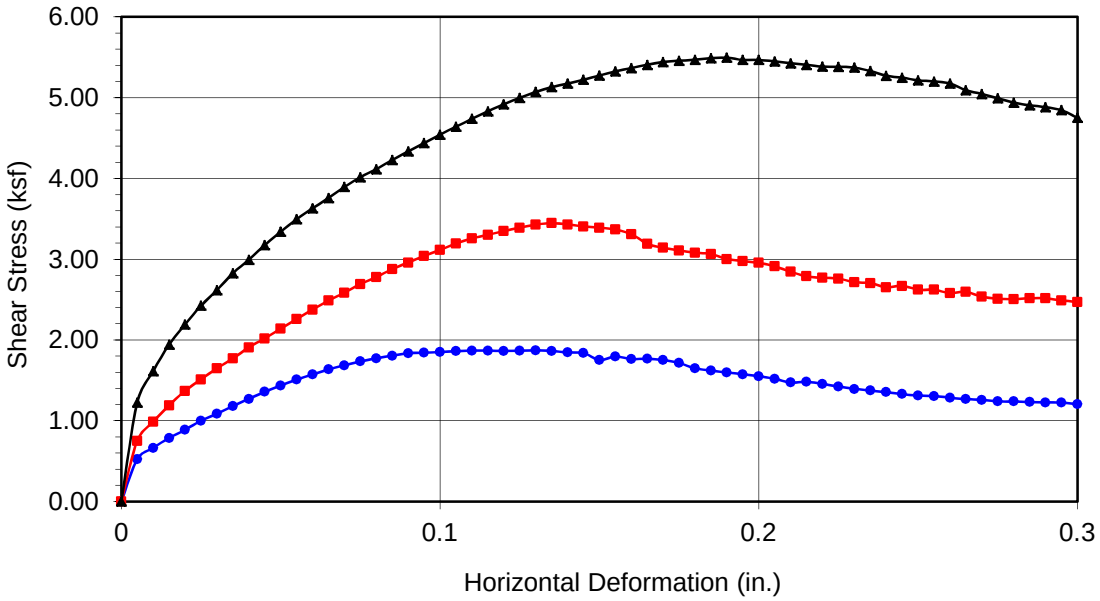
$LL = Wn(N/25)^{0.121}$

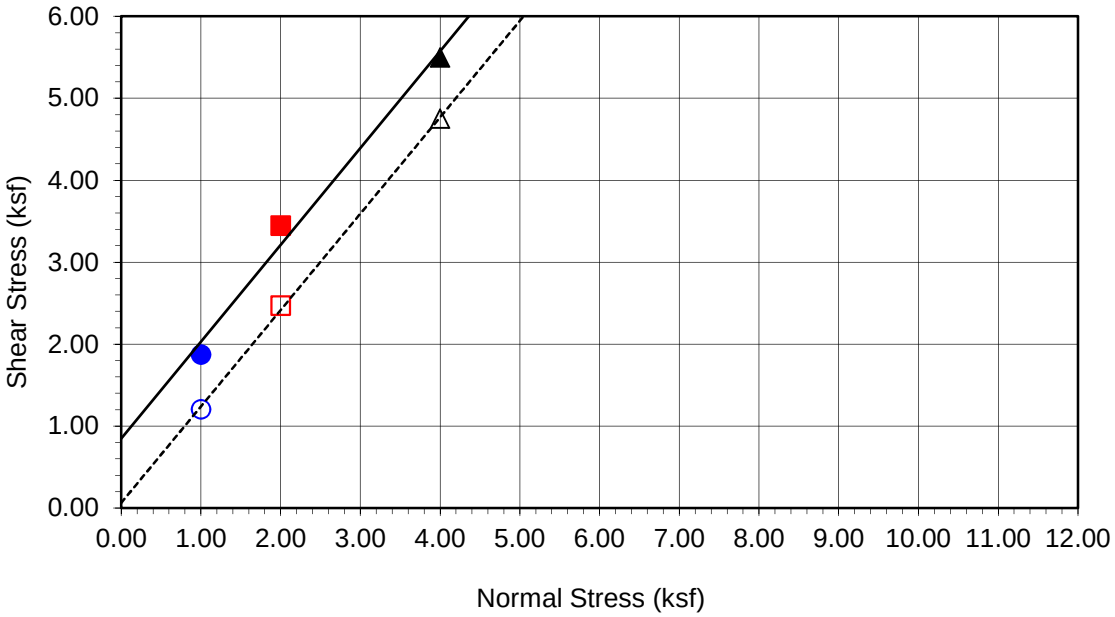


PROCEDURES USED

	Wet Preparation
	Multipoint - Wet
X	Dry Preparation
	Multipoint - Dry
X	Procedure A
	Multipoint Test
	Procedure B
	One-point Test







Boring No.	**LB-1**
Sample No.	**R-1**
Depth (ft)	**5**
Sample Type:	Ring
Soil Identification:	Brown clayey sand with gravel (SC)g

Strength Parameters

	C (psf)	ϕ (°)
Peak	847	50
Ultimate	65	50

Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 1.871	■ 3.446	▲ 5.495
Shear Stress @ End of Test (ksf)	○ 1.204	□ 2.471	△ 4.750
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	9.24	9.24	9.24
Dry Density (pcf)	128.7	128.5	128.9
Saturation (%)	80.6	80.0	81.2
Soil Height Before Shearing (in.)	0.9938	0.9903	0.9751
Final Moisture Content (%)	11.1	10.6	10.8

Leighton

DIRECT SHEAR TEST RESULTS

Consolidated Undrained

Project No.: 11224.001

La Salina Lift Station

04-16

Leighton

R-VALUE TEST RESULTS

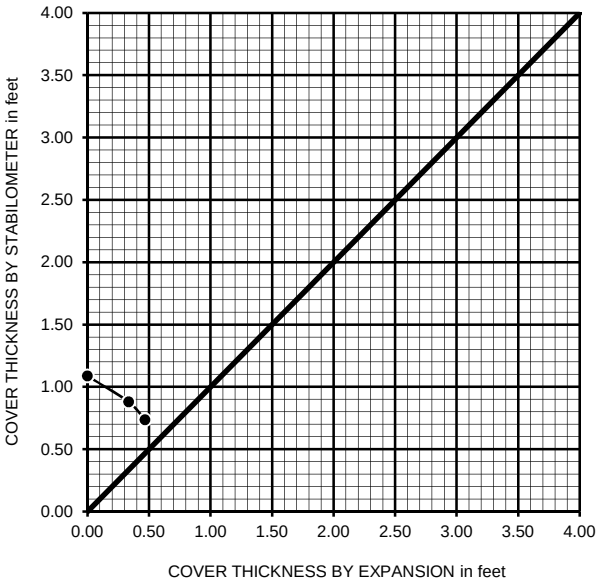
DOT CA Test 301

PROJECT NAME:	La Salina Lift Station	PROJECT NUMBER:	11224.001
BORING NUMBER:	LB-1	DEPTH (FT.):	0-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	S. Felter
SAMPLE DESCRIPTION:	Olive brown silty, clayey sand (SC-SM)	DATE COMPLETED:	4/21/2016

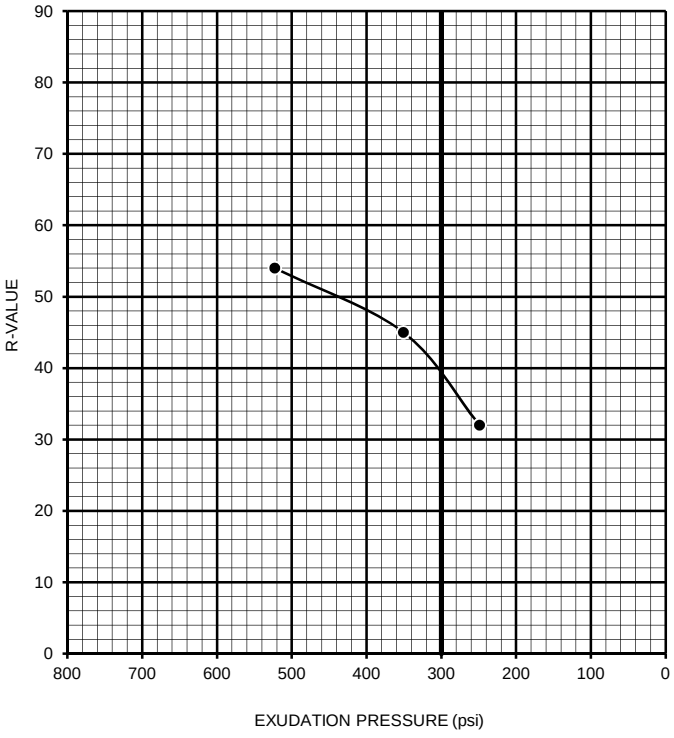
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	9.9	10.4	10.8
HEIGHT OF SAMPLE, Inches	2.44	2.46	2.46
DRY DENSITY, pcf	120.2	127.7	130.5
COMPACTOR PRESSURE, psi	150	110	75
EXUDATION PRESSURE, psi	523	351	249
EXPANSION, Inches x 10exp-4	14	10	0
STABILITY Ph 2,000 lbs (160 psi)	53	71	90
TURNS DISPLACEMENT	3.93	3.76	4.12
R-VALUE UNCORRECTED	56	45	32
R-VALUE CORRECTED	54	45	32

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	0.74	0.88	1.09
EXPANSION PRESSURE THICKNESS, ft.	0.47	0.33	0.00

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	63
R-VALUE BY EXUDATION:	39
EQUILIBRIUM R-VALUE:	39

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SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	La Salina Lift Station		Tested By :	G. Berdy	Date: 04/29/16
Project No. :	11224.001		Data Input By:	J. Ward	Date: 05/04/16
Boring No.:	LB-1		Depth (ft.) :	0-5	
Sample No. :	B-1				

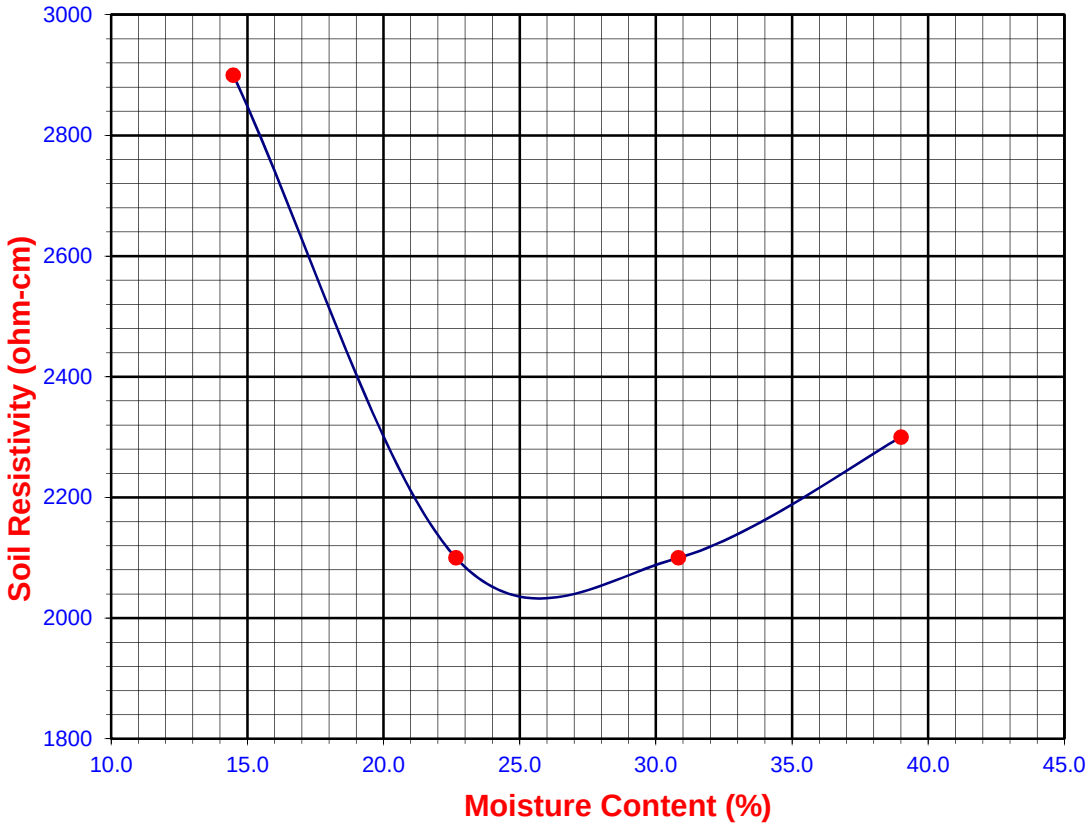
Soil Identification:* Olive brown SC-SM

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	10	14.49	2900	2900
2	20	22.66	2100	2100
3	30	30.83	2100	2100
4	40	39.00	2300	2300
5				

Moisture Content (%) (MCi)	6.32
Wet Wt. of Soil + Cont. (g)	216.18
Dry Wt. of Soil + Cont. (g)	206.49
Wt. of Container (g)	53.13
Container No.	
Initial Soil Wt. (g) (Wt)	130.13
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2030	**25.7**	**110**	**21**	**8.17**	**21.0**

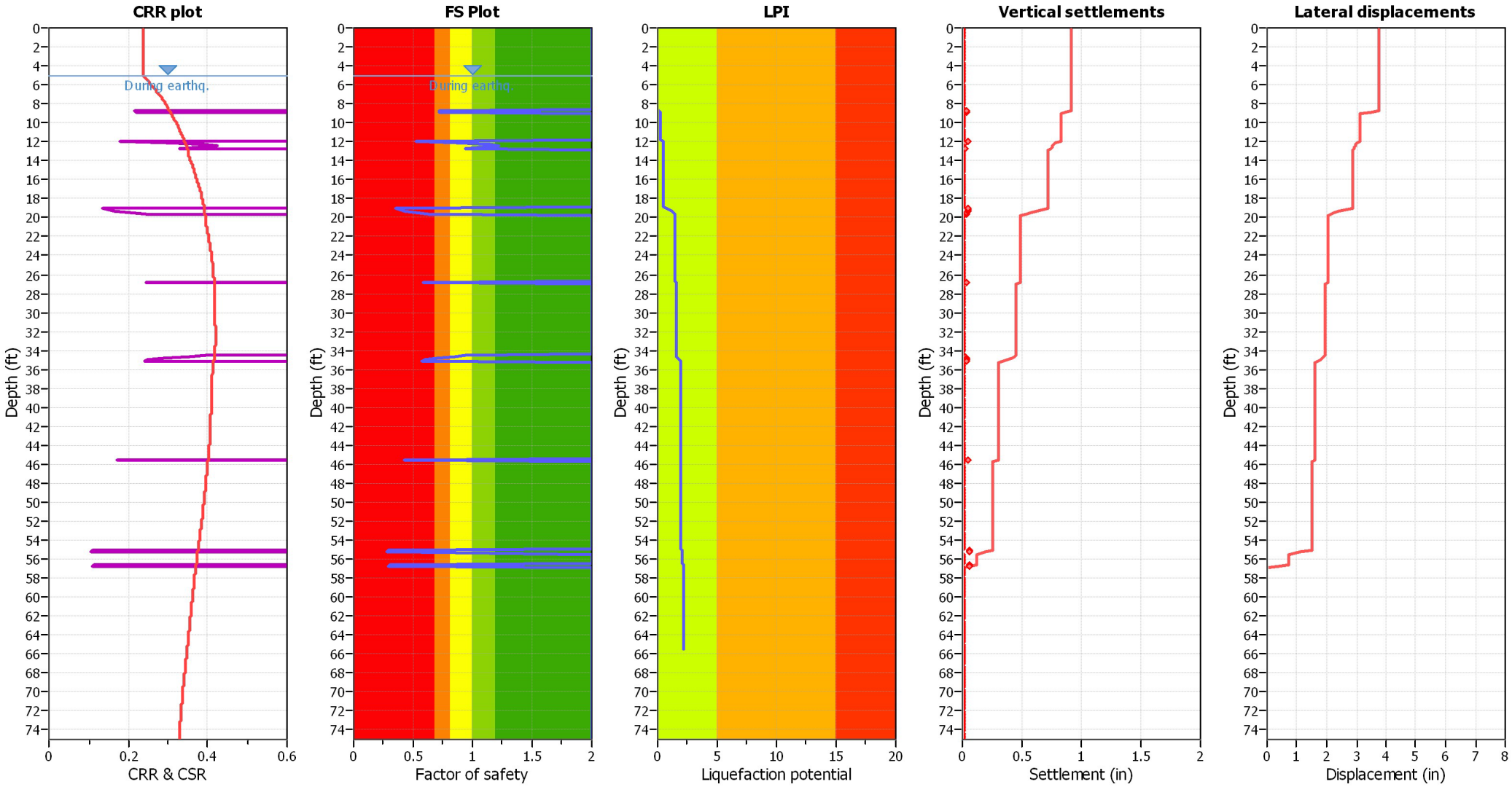


APPENDIX D

LIQUEFACTION ANALYSIS

Leighton

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.49	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	66.00 ft

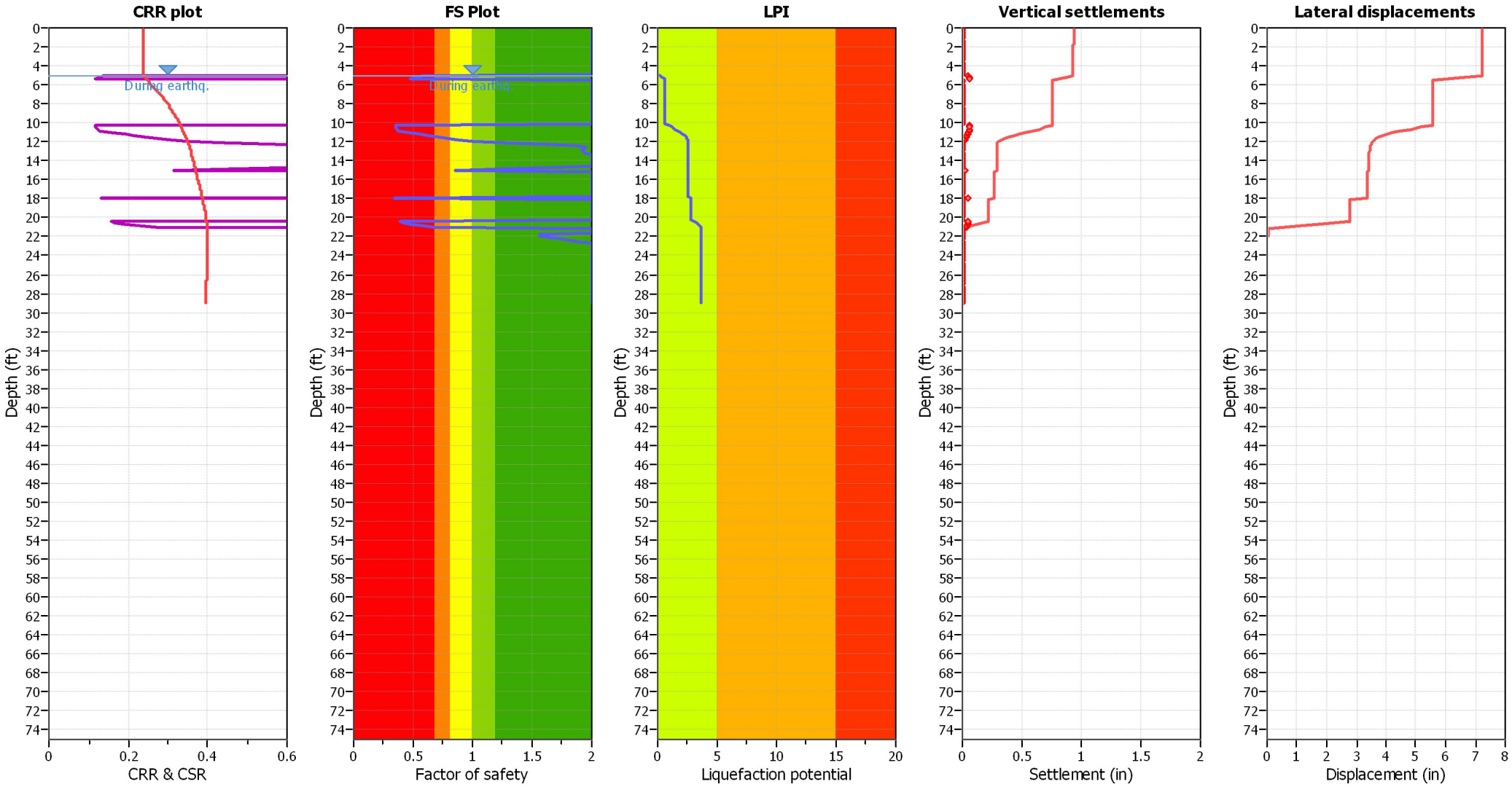
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.49	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

La Salina Lift Station and Treatment Plant Decommissioning

Appendix N. Hydraulic Surge Analysis

To be included with final report.

La Salina Lift Station and Treatment Plant Decommissioning

Appendix O. Final Project Hydraulics

TETRA TECH
17885 Von Karman Ave. Suite 500, Irvine, CA 92614
Tel: 949.809.5000
Fax: 949.809.5007

Client:	City of Oceanside	Sheet No.	1 of 5
Project:	La Salina Lift Station & Treatment Plant Decommissioning	Job No.	135-09369-15003
	La Salina Lift Station System Curve	Computed by:	MBL
		Checked by:	MWB Date: 12/20/2017

Objective: Determine the system curve of the proposed La Salina Lift Station using a new 20" ID Force Main down Oceanside Blvd to the Buena Vista Pipeline.

Assumptions:

1. The Hazen-Williams C-factors are assumed to be as follows:
   - Exist PVC = 130
   - Exist DIP, Poly Lined = 120
   - New DIP, Epoxy Lined = 130
   - New HDPE = 130
2. The minor losses are taken from "Pumping Station Design" pgs. 898-900.
3. The pump station suction grade line is based on the high and low water levels in the proposesd La Salina lift station well.
   LWL = -9.5 HWL = -5
4. The force main is pumping into the Buena Vista Pipeline at the intersection of Oceanside Blvd and El Camino Real
   Peak Flow HGL Elev = 101 (this uses a Buena Vista peak flow of 7.7 MGD)
   Avg Flow HGL Elev = 87 (this uses a Buena Vista avg flow of 2.2 MGD)
5. The water level in the San Luis Rey WRF Headworks.
   (HWL Elev = 80.45 per plan, however, the SLRWRF plans were based on NGVD 29, so a value of 2.2' has been added to the as-built elevation)
   HWL Elev = 82.65
6. The pump station is designed to pump 5.5 MGD (3820 gpm) using 2 pumps (2 additional pumps on stand-by)
7. The peak flow from the Buena Vista Pipeline is 7.7 MGD (5350 gpm)
8. The avg flow from the Buena Vista Pipeline is 2.2 MGD (1530 gpm)
9. The Oceanside Blvd Gravity Sewer Flows and Mesa Drive Gravity Sewer Flows will be re-routed to the Mission Lift Station and therefore are omitted from the hydraulic calcs.

Pipe Velocity:

$Q = VA$

$Q = V*\pi*d^2/4$

Flow Rate (GPM)	Pipe Dia (in)	Velocity (ft/s)	Description
1910	10	7.8	Pump Discharge Piping
1910	12	5.4	Pump Suction Piping
3820	20	3.9	Discharge Header

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Step 1 ***Calculate Pipe Friction Losses***

Hazen-Williams Equation: $h_L=10.44*L(ft)*Q^{1.85}(gpm)/C^{1.85}*D^{4.87}(inches)$

Pipe ID (in)	Length (L.F.)	Material	C Factor (Assumed)	Lining	Description
12	20	DIP	130	New Epoxy Lined	New Pump Suction Pipe
10	10	DIP	130	New Epoxy Lined	New Pump Discharge Pipe
20	50	DIP	130	New Epoxy Lined	New Discharge Header
20	400	DIP	130	New Epoxy Lined	New Force Main from La Salina LS to Pacific Street
20	17000	HDPE	130	N/A	New Force Main to Buena Vista Pipeline at Oceanside Blvd/El Camino Real
30	2850	PVC	130	N/A	Existing Buena Vista Pipeline
42	1000	DIP	120	Poly Lined	Existing Buena Vista Pipeline
36	750	DIP	120	Poly Lined	Existing Buena Vista Pipeline
42	14670	DIP	120	Poly Lined	Existing Buena Vista Pipeline

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Step 2 ***Calculate Minor Losses***

Minor Losses Equation: $h_M=Kv^2/2g$

Pump Suction Piping

Pipe Dia (in)	Fitting	K Values	Quantity	K Total
12	Entrance Loss	0.05	1	0.05
12	90° Bend	0.25	1	0.25
12	Plug Valve	1	2	2
12	Cross-Line	0.5	1	0.5
12	In-line Grinder	2.5	1	2.5
12	Ecc Reducer	0.04	3	0.12
Total K Value				**5.42**

Pump Discharge Piping

Pipe Dia (in)	Fitting	K Values	Quantity	K Total
10	Ecc Reducer	0.04	1	0.04
10	Swing Check Valve	2.2	1	2.2
10	90° Bend	0.25	1	0.25
10	Plug Valve	1	1	1
10	Tee-Branch	0.75	1	0.75
Total K Value				**4.24**

Pump Discharge Header

Pipe Dia (in)	Fitting	K Values	Quantity	K Total
20	90° Bend	0.25	3	0.75
20	Mag Meter	0.3	1	0.3
20	Plug Valve	1	3	3
20	Tee-Line	0.3	1	0.3
20	Tee-Branch	0.75	1	0.75
Total K Value				**5.1**

Proposed La Salina Force Main

Pipe Dia (in)	Fitting	K Values	Quantity	K Total
20	Plug Valve	1	2	2
20	Check Valve	2.2	1	2.2
20	22.5° Bend	0.075	20	1.5
Total K Value				**5.7**

Assumed 1-22 deg bend per 1000 ft

Existing Buena Vista Pipeline

Pipe Dia (in)	Fitting	K Values	Quantity	K Total
42	Plug Valve	1	4	4
42	22.5° Bend	0.075	20	1.5
Total K Value				**5.5**

Assumed 1-22 deg bend per 1000 ft

TETRA TECH

17885 Von Karman Ave. Suite 500, Irvine, CA 92614
Tel: 949.809.5000
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Step 3 ***Determine Static Lift***

$H_{(static)}$ = Buena Vista HGL - La Salina Wet Well Elev

Maximum Static Lift		***Minimum Static Lift***	
Peak Flow HGL Elev	101	Avg Flow HGL Elev	87
La Salina Low Water Level	-9.5	La Salina High Water Level	-5
$H_{(static-max)}$=	110.5	$H_{(static-min)}$=	92

TETRA TECH
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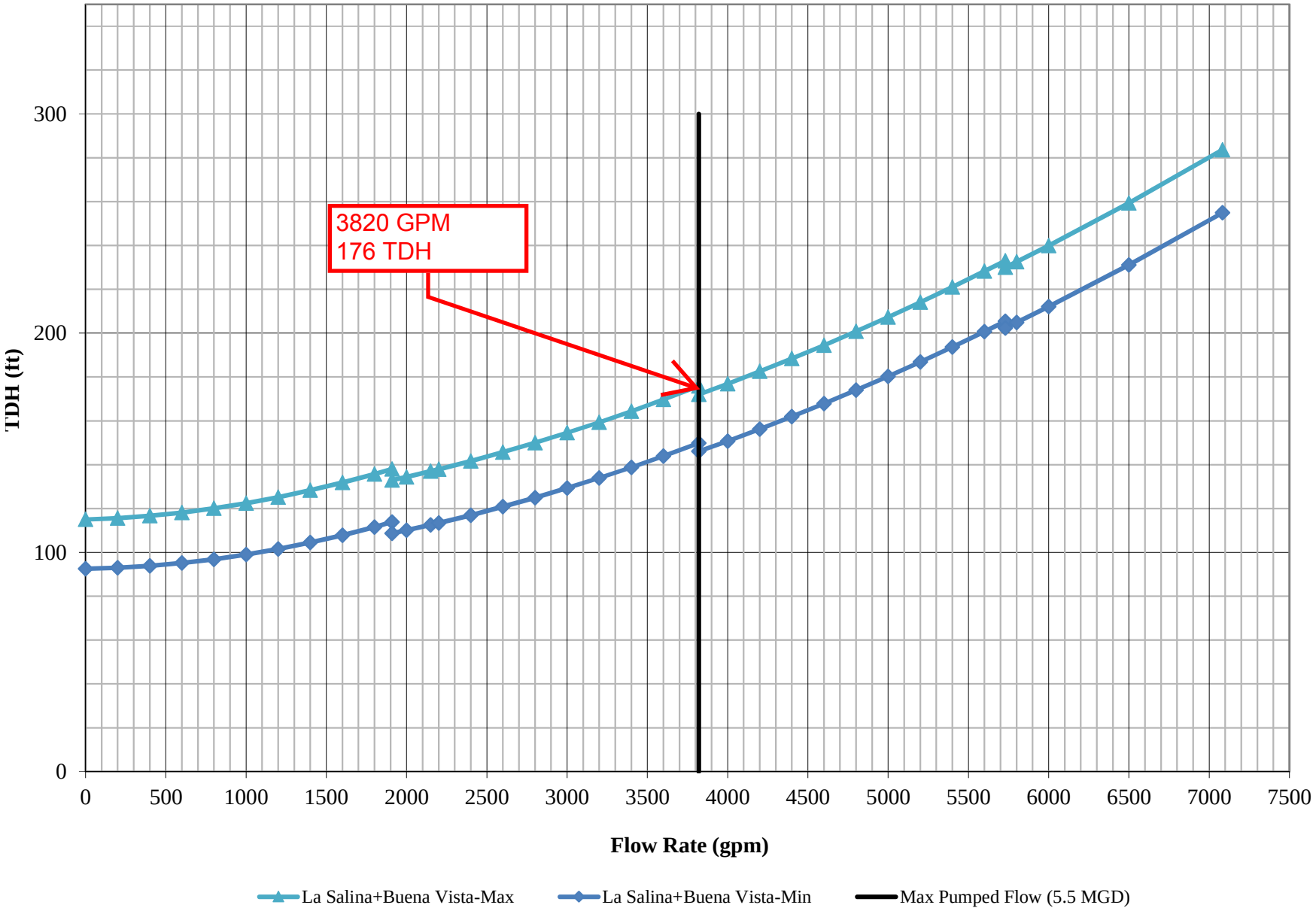
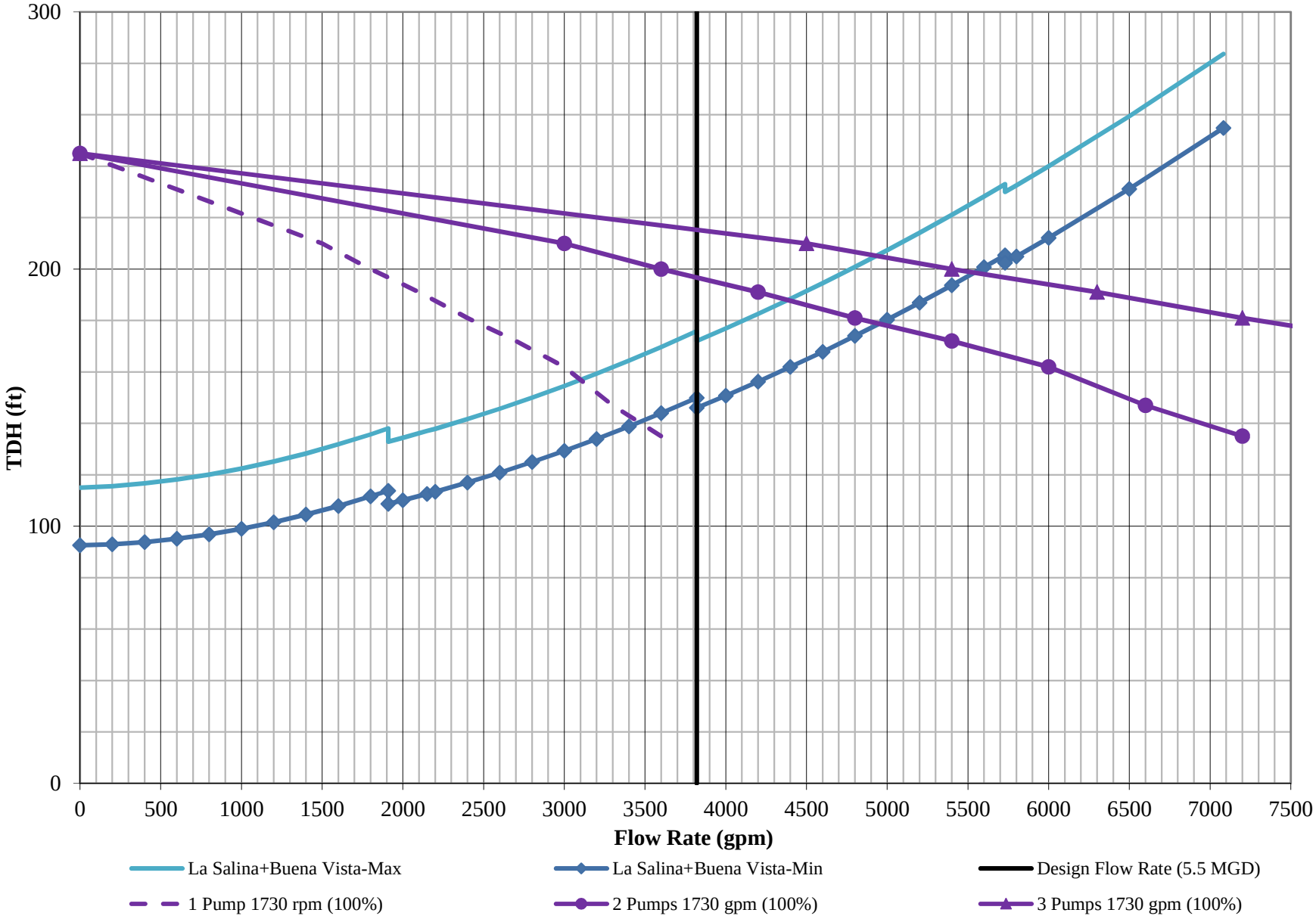
Step 4 ***Determine System Curve***

Q (gpm)	Friction H_L (ft) La Salina	Friction H_L (ft) La Salina + Avg Buena Vista Flows	Friction H_L (ft) La Salina + Max Buena Vista Flows	Minor H_L (ft)	Min TDH (ft) La Salina	Max TDH (ft) La Salina	Min TDH (ft) La Salina + Avg Buena Vista Flows	Max TDH (ft) La Salina + Max Buena Vista Flows	Velocity in 20" ID FM (ft/sec)
0	0.0	0.4	4.4	0.1	92.1	110.6	92.6	115.0	0.00
200	0.2	0.7	4.9	0.2	92.4	110.9	93.0	115.6	0.20
400	0.7	1.4	5.7	0.5	93.2	111.7	93.8	116.6	0.41
600	1.5	2.3	6.8	0.9	94.4	112.9	95.1	118.1	0.61
800	2.6	3.4	8.1	1.4	96.1	114.6	96.9	120.1	0.82
1000	4.0	4.9	9.8	2.1	98.1	116.6	99.0	122.4	1.02
1200	5.6	6.5	11.6	3.0	100.6	119.1	101.6	125.1	1.23
1400	7.4	8.5	13.7	4.0	103.4	121.9	104.5	128.3	1.43
1600	9.5	10.6	16.1	5.2	106.7	125.2	107.8	131.8	1.63
1800	11.8	13.0	18.7	6.6	110.3	128.8	111.6	135.7	1.84
1910	13.1	14.4	20.2	7.4	112.5	131.0	113.8	138.0	1.95
1910	12.9	14.2	19.9	2.5	107.4	125.9	108.7	132.9	1.95
2000	14.0	15.3	21.2	2.7	108.7	127.2	110.1	134.4	2.04
2150	16.0	17.4	23.4	3.1	111.1	129.6	112.5	137.0	2.20
2200	16.7	18.1	24.1	3.3	112.0	130.5	113.4	137.9	2.25
2400	19.6	21.1	27.3	3.8	115.5	134.0	117.0	141.7	2.45
2600	22.8	24.3	30.7	4.5	119.3	137.8	120.8	145.7	2.66
2800	26.1	27.8	34.3	5.2	123.3	141.8	124.9	150.0	2.86
3000	29.7	31.4	38.1	5.9	127.6	146.1	129.3	154.5	3.07
3200	33.4	35.2	42.2	6.7	132.1	150.6	133.9	159.3	3.27
3400	37.4	39.3	46.4	7.5	136.9	155.4	138.8	164.4	3.47
3600	41.6	43.5	50.8	8.4	142.0	160.5	143.9	169.7	3.68
3820	46.4	48.4	55.9	9.4	147.8	166.3	149.9	175.8	3.90
3820	46.2	48.2	55.7	5.8	144.0	162.5	146.1	172.0	3.90
4000	50.3	52.4	60.0	6.4	148.7	167.2	150.8	176.9	4.09
4200	55.1	57.3	65.1	7.0	154.1	172.6	156.2	182.5	4.29
4400	60.0	62.3	70.2	7.7	159.7	178.2	161.9	188.4	4.50
4600	65.2	67.5	75.6	8.3	165.5	184.0	167.8	194.5	4.70
4800	70.5	72.9	81.2	9.1	171.6	190.1	174.0	200.8	4.90
5000	76.1	78.5	87.0	9.8	177.9	196.4	180.3	207.3	5.11
5200	81.8	84.3	93.0	10.6	184.4	202.9	186.9	214.1	5.31
5400	87.7	90.3	99.1	11.4	191.1	209.6	193.7	221.0	5.52
5600	93.8	96.5	105.5	12.2	198.0	216.5	200.7	228.2	5.72
5730	97.9	100.6	109.7	12.8	202.7	221.2	205.4	233.0	5.86
5730	97.7	100.4	109.5	10.0	199.7	218.2	202.4	230.0	5.86
5800	99.9	102.7	111.8	10.2	202.1	220.6	204.9	232.5	5.93
6000	106.4	109.2	118.6	10.9	209.3	227.8	212.1	239.9	6.13
6500	123.4	126.4	136.1	12.7	228.1	246.6	231.1	259.4	6.64
7083	144.6	147.8	158.1	15.1	251.7	270.2	254.9	283.6	7.24

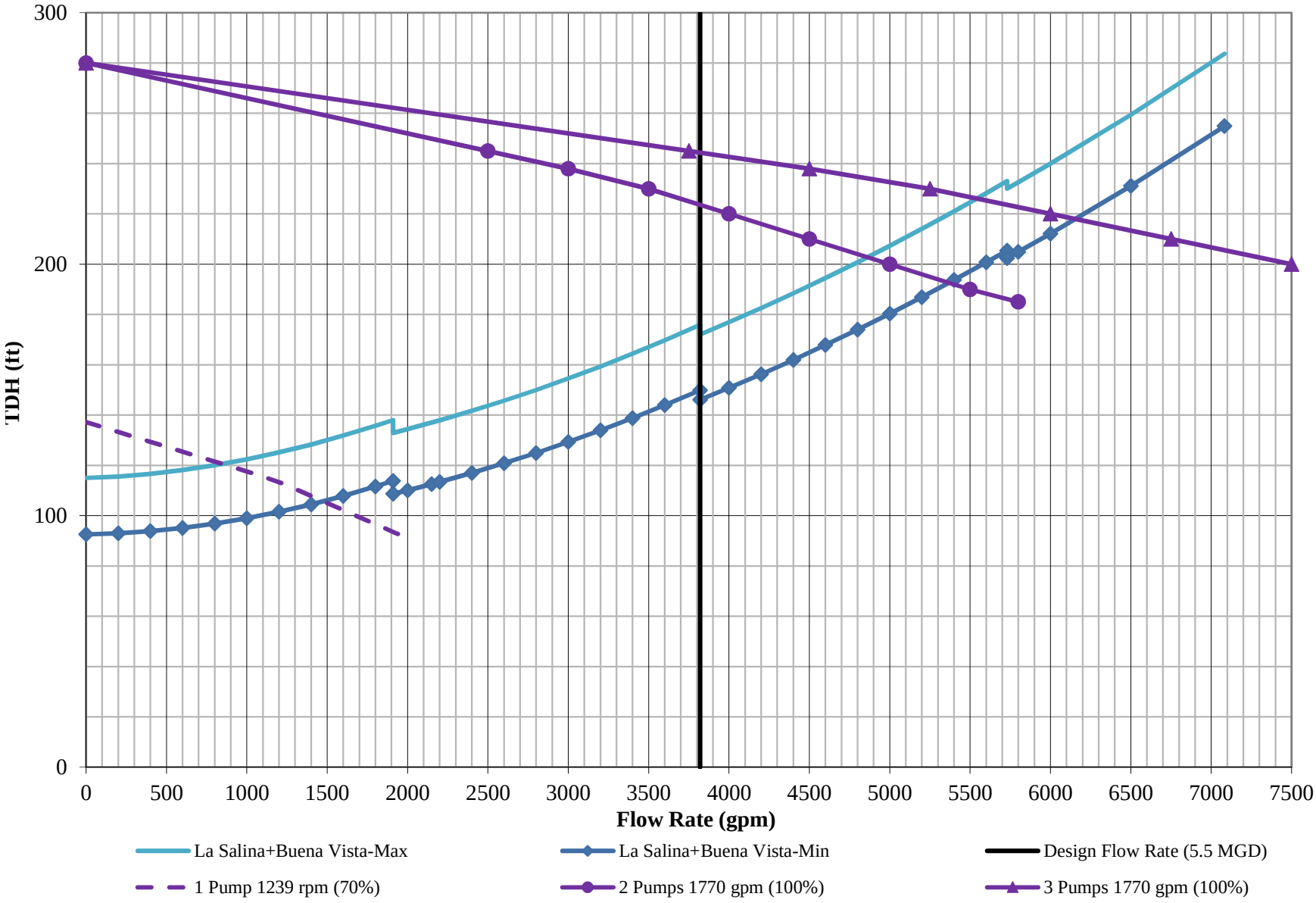
Proposed La Salina Lift Station
System Curve

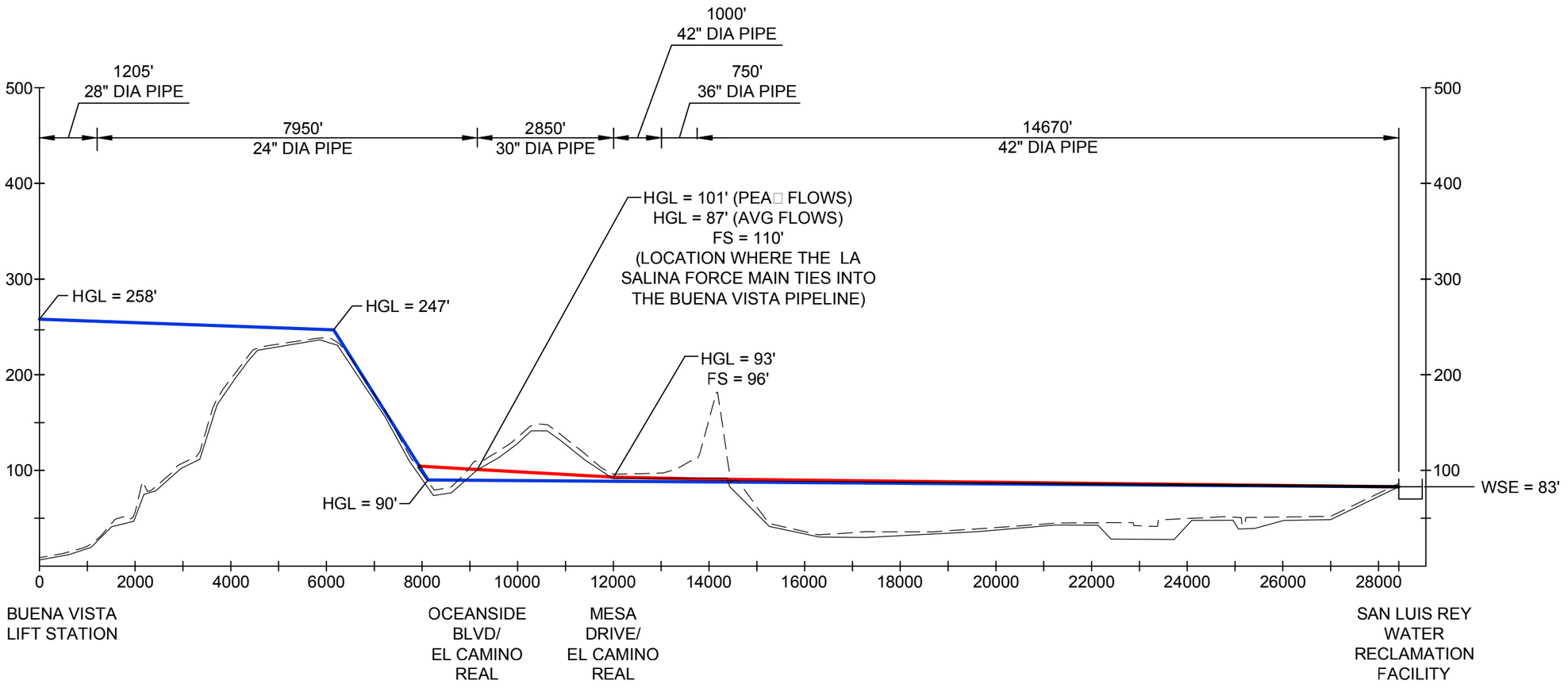


Proposed La Salina Lift Station
System Curve - Vaughan Pump



Proposed La Salina Lift Station
System Curve - Cornell Pump





LEGEND:

HGL FOR BUENA VISTA LIFT STATION ONLY (7.7 MGD)

HGL FOR COMBINED BUENA VISTA AND LA SALINA FLOWS (13.2 MGD)

TETRA TECH
www.tetratech.com
17885 Von karman Ave, Suite 500
Irvine, Ca. 92614
PHONE: (949) 809-5000 FAX: (949) 809-5010

CITY OF OCEANSIDE

LA SALINA LIFT STATION & PLANT DECOMMISSIONING

BUENA VISTA PIPELINE HGL
FOR ALTERNATIVE 3C

Project No.:	135-09369-15003
Date:	NOVEMBER 2017
Designed By:	MBL
Figure	A

Bar Measures 1 inch

Copyright: Tetra Tech

12/22/2017 8:35:35 AM - P:\09369\135-09369-15003\CAD\CONCEPTUAL\C730-BUENAVISTAHGL-WITHOUTGRAVITYSEWERS.DWG - LOVEGREN, MOLLY

La Salina Lift Station and Treatment Plant Decommissioning

Appendix P. Equipment Catalog Data Sheets

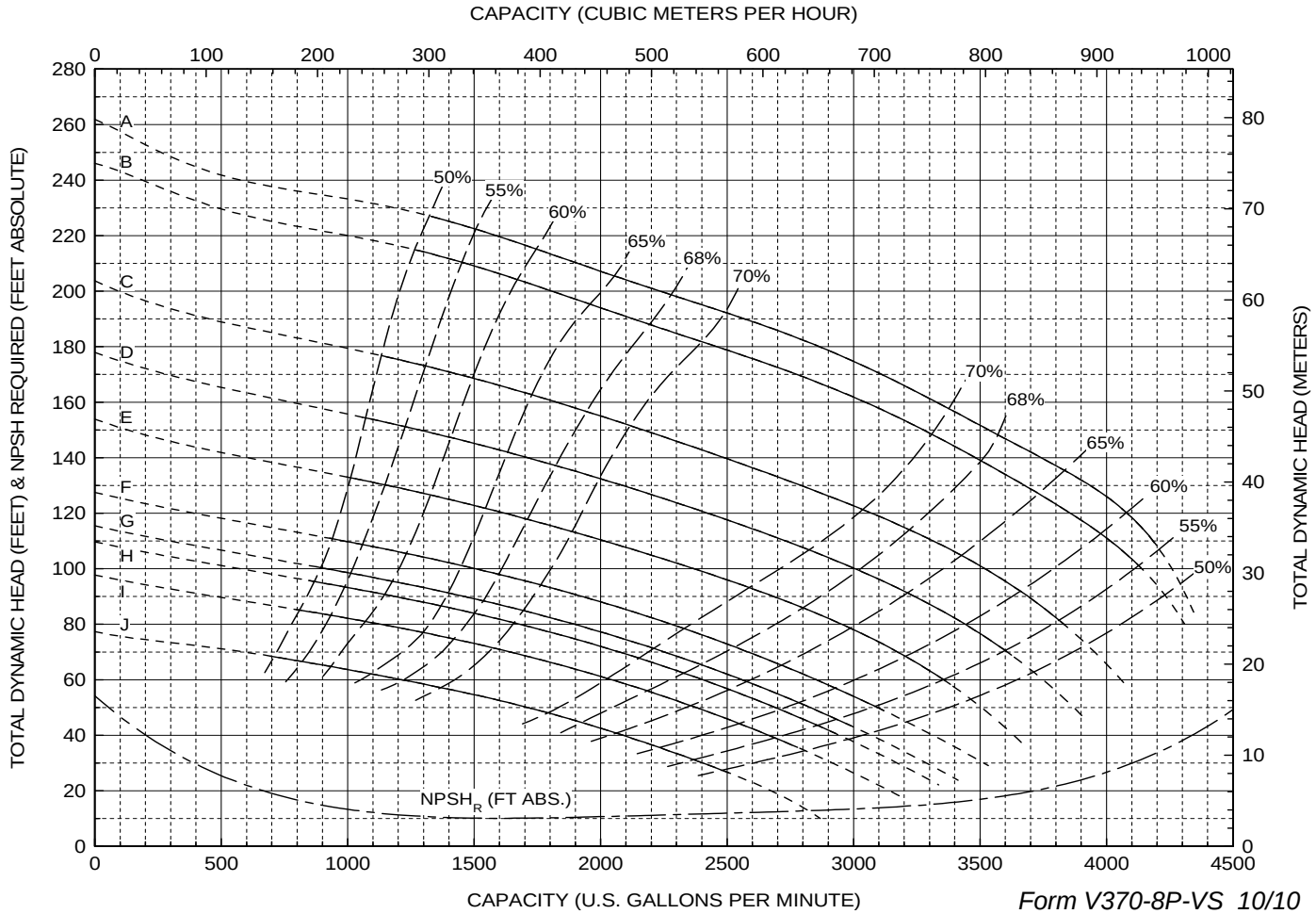
Vaughan E Series Chopper Pump PERFORMANCE CURVE

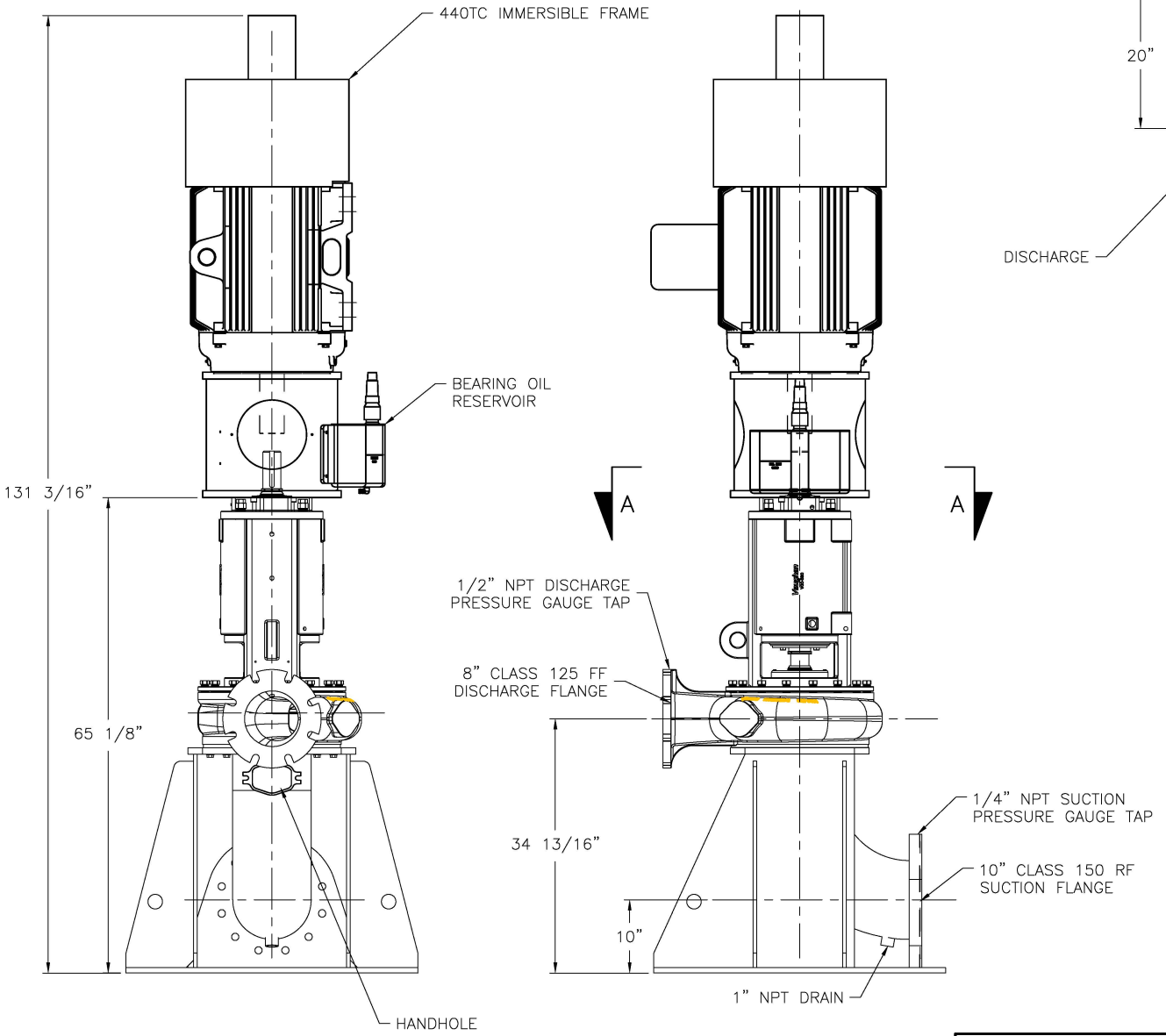
Models:
HE8P10
PE8P10
V8P
S8P

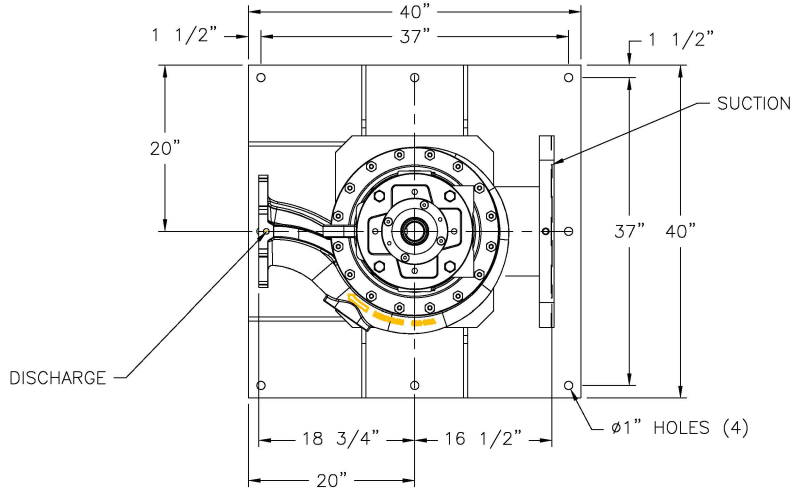
Back-Pull-Out Casing
4-Blade Impeller
8” Discharge
10” Suction
Variable Speed Curve

CURVE	POWER (HP/KW)	SPEED (RPM)	IMPELLER DIAMETER
A	250/185*	1785	15.00” (381 mm)
B	200/150	1730	15.00” (381 mm)
C	150/110	1570	15.00” (381 mm)
D	125 / 90	1470	15.00” (381 mm)
E	100 / 75	1365	15.00” (381 mm)
F	75 / 55	1245	15.00” (381 mm)
G	75 / 55**	1185	15.00” (381 mm)
H	60 / 45	1155	15.00” (381 mm)
I	50 / 37	1090	15.00” (381 mm)
J	40 / 30	970	15.00” (381 mm)

DO NOT OPERATE PUMP IN DOTTED PORTION OF CURVES. CURVES SUBJECT TO CHANGE WITHOUT NOTICE. EFFICIENCIES SHOWN ARE NOMINAL. GUARANTEED MINIMUM EFFICIENCIES PER H.I. LEVEL B. *EXCEEDS 200 HP AFTER 3650 GPM. **EXCEEDS 60 HP AFTER 2700 GPM.







SECTION A–A

NOTES:

1. PUMP WEIGHT: 1386 LBS
2. MOTOR WEIGHT: 1520 LBS
3. TOTAL WEIGHT: 2906 LBS
4. PERFORMANCE REQUIRED: GPM @ TDH
5. MOTOR: HP, RPM
   POWER: V, PH, HZ
   ENCLOSURE:
   MANUFACTURED BY:
6. SURFACE PREPARATION:

VAUGHAN CO., INC.
364 MONTE-ELMA ROAD
MONTESANO, WA 98563
PHONE: (360) 249--4042
FAX: (360) 249--6155

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TITLE: OUTLINE DIMENSIONS
MODEL: PE8P10CS–

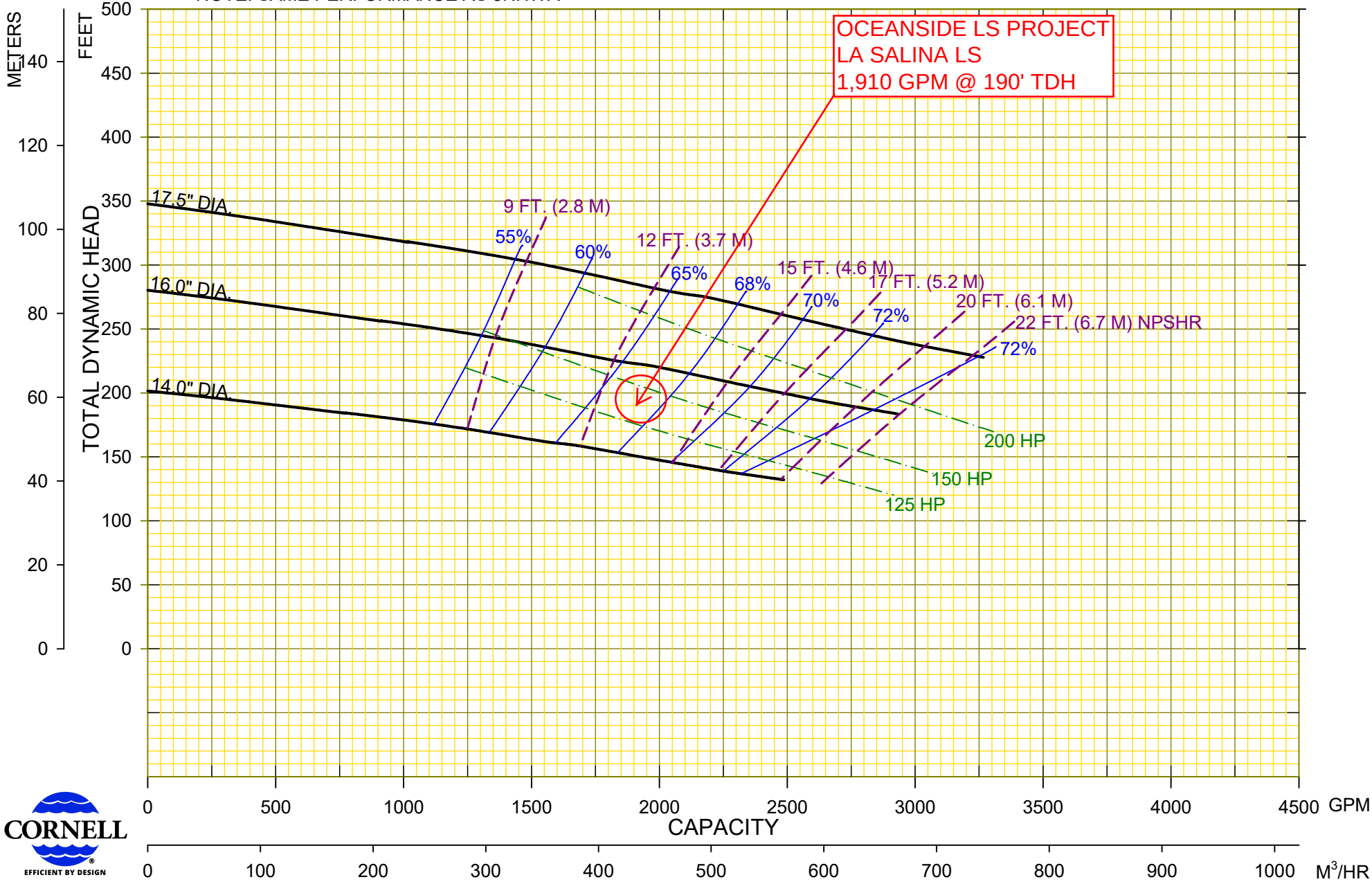
CUSTOMER:

VAUGHAN SALES ENGR: LOCATION:

JOB ORDER NUMBER: DATE: VAUGHAN QUOTATION NUMBER:

Performances shown are for S.G. 1.0 60°F water, frane mount configuration. Other mounting styles or S.G. may require curve adjustments.	Speed	Impeller Dia.	Style	Volute	Solids Dia.	N_s	Suction	Discharge	No. Vanes
	1770 RPM	VARIOUS	ENCLOSED	SINGLE	3"	1617	10"	6"	2

NOTE: SAME PERFORMANCE AS 8NHWA



CORNELL
EFFICIENT BY DESIGN

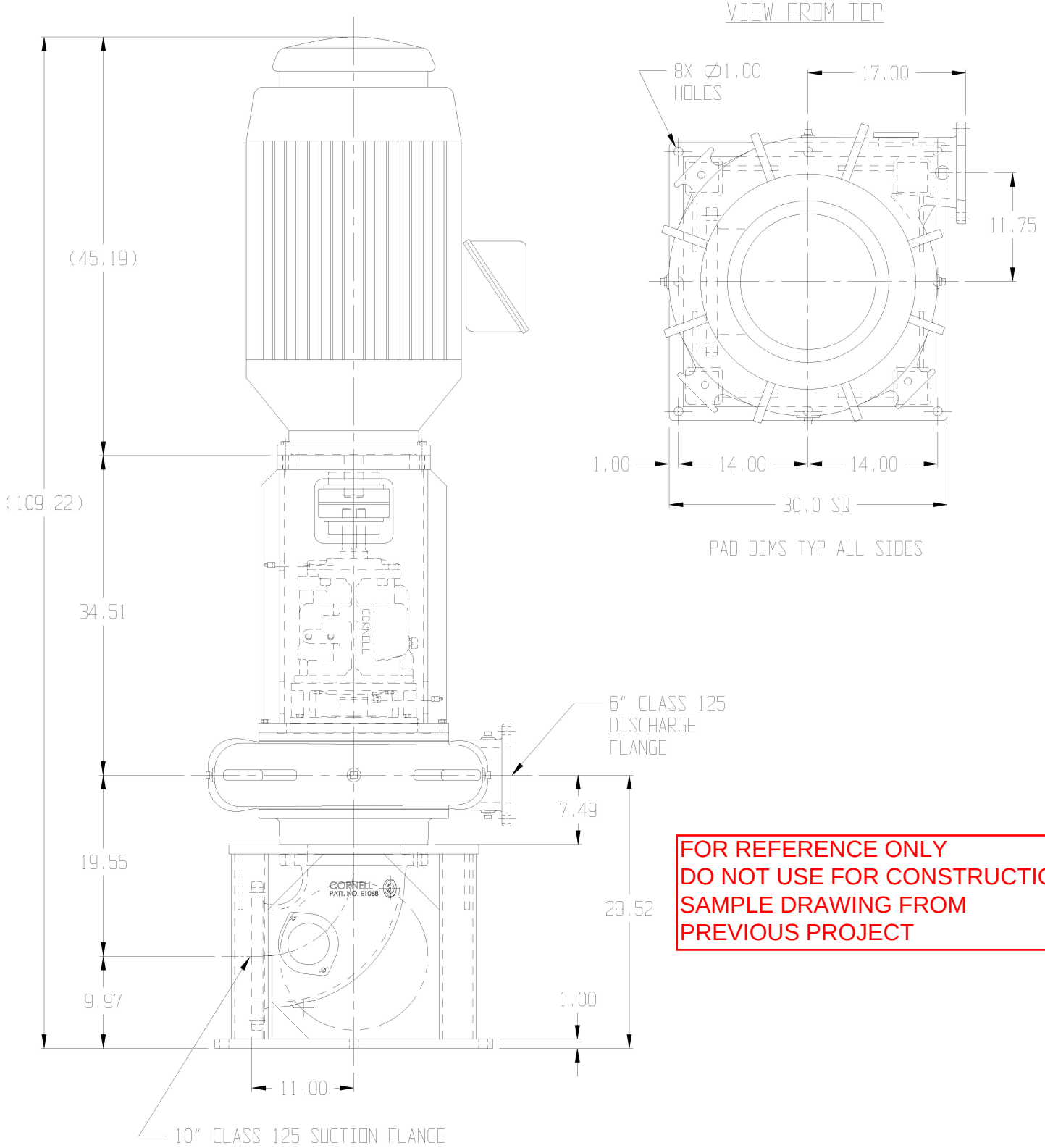
Cornell Pump Company • Clackamas, Oregon

X	X	X
00	06/08/17	FM

MODEL : 6NHWB
TYPE :CUTTER

CURVE NO: 6NHWB18

F15121



FOR REFERENCE ONLY
DO NOT USE FOR CONSTRUCTION
SAMPLE DRAWING FROM
PREVIOUS PROJECT

PRELIMINARY

NOTES:
1. OVERALL DIMENSIONS MAY VARY ±.12.
2. DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED
3. REF DRIVER STAND E4679, PUMP STAND D7085

CORNELL®

CUSTOMER: PUMP SOLUTIONS
P.O. NO.:
S.O. NO.:
PROJECT NAME:
MOTOR MANUF.: BALDOR HP: 200
FRAME SIZE: 447 RPM: 1800
ENCLOSURE: TEFC

REV. NO.	DESCRIPTION	DATE	BY
	FOUNDATION PRINT 6NHTB-VC180B, 10X10, MTR (200-4)		

DR. KHL | CHECKED DT | DATE 6-28-17 | SCALE TO SCALE

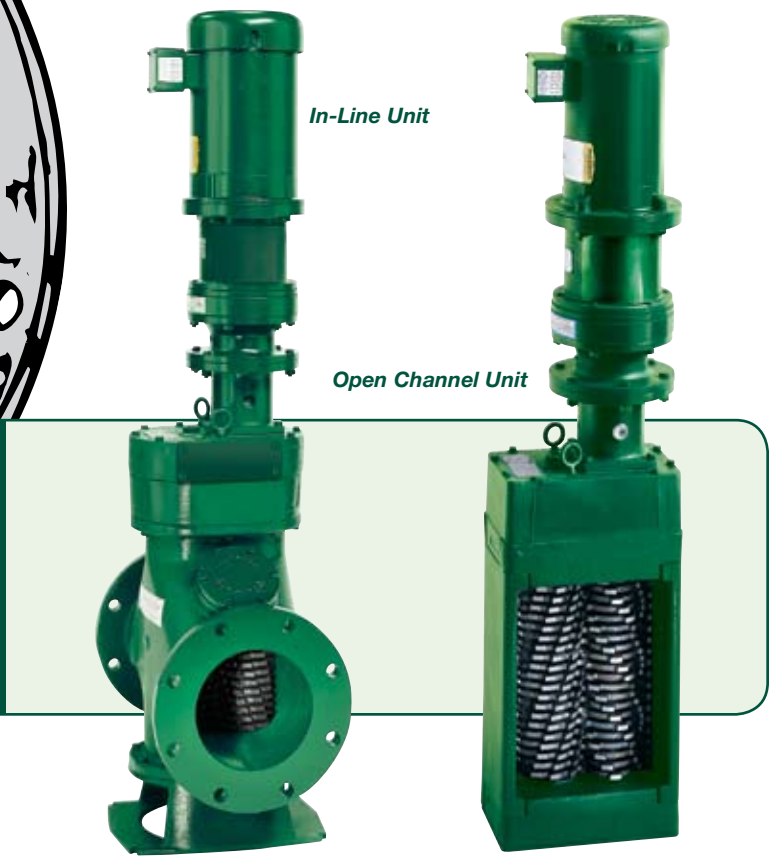
CORNELL PUMP COMPANY PORTLAND, OREGON

PATT. NO.
JOB NO.
DWG NO. F15121
REV. 0



Muffin Monster®

Family of Grinders



In-Line Unit

Open Channel Unit

Mini Monster®

For low flow, buildings and certain sludge line applications the Mini Monster is a reliable grinder in a small package. It macerates wastewater or sludge to eliminate costly pump problems and sewer back-ups.

Muffin Monster

Troublesome solids are now easier than ever to reduce with the Muffin Monster dual-shafted grinder. It's low speed, high-torque design shreds tough solids that typically cause sewer problems. With over 20,000 installations the Muffin Monster is legendary for protecting pumps and keeping the wastewater flowing.

Macho Monster

For big solids reduction projects the Macho Monster has the power to keep up with huge slugs of material. It uses massive 7-1/2" (190mm) steel cutters that slice through difficult solids in wastewater, sludge, industrial or food processing applications.



Dual shafted grinder



Exclusive: hex seal cartridge

Features & Benefits

Dual Shafted Grinder
- Capable of grinding a wider variety of solids than single shafted machines or macerators
- High torque allows the grinder to handle rocks, sticks, clothing, plastics, bedding and more without jamming

Ease and Flexibility of Installation
- Adapts to existing pipeline or channel applications with little or no modification to piping or channel
- In-line unit incorporates a quick-change cutter cartridge

Cartridge Seal Assembly
- High pressure capability – 90 PSI (6 bar)
- No seal flush required and no packing gland to adjust

High-Flow Side Rails
- Increases flow rate and decreases head loss
- Deflects solids into the cutting chamber

Compact, Efficient Design
- Cutter and reducer design allows the use of small, energy efficient motors – 3 to 10 HP (2.2 to 7.5kW)
- Compact units fit in cramped corners or pump stations

Automated PLC Monitoring and Controls
- Auto load sensing and reversing reduces interrupts, protects system and eliminates need for manual check-ups

JWC Environmental®

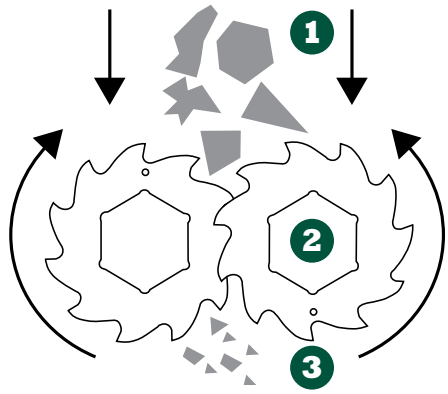
Trust Monster Quality™

Operation

1) Solids are conveyed to the Mini / Muffin / Macho Monster via the waste stream.

2) Solids pass through the rotating cutters for size reduction.

3) Ground particles move on with the waste stream and pose no threat to downstream equipment.



Applications

Industry	Mini Monster	Muffin Monster	Macho Monster	Application Notes
Buildings / Resorts	⚙	⚙		More powerful than grinder pumps. Prevents sewer overflows and eliminates messy pump rebuilds
Pump Stations	⚙	⚙	⚙	Stainless steel guide rails make installation and retrieval easy
Screenings		⚙	⚙	Improves washing and compacting of screened solids
Sludge / Scum	⚙	⚙	⚙	Cleaner, stronger and longer lasting than macerators
Belt Press / Centrifuge	⚙	⚙	⚙	Grinds a wide variety of solids, including rocks and rags, to protect sensitive dewatering equipment
Jails / Prisons		⚙	⚙	Over 2,000 grinders installed in correctional facilities
Hospitals / Nursing Homes		⚙	⚙	Shreds large solids including rags, pads, clothing and dangerous medical waste
Food / Fish Processing		⚙	⚙	Sample grinder installations: fish guts, slaughterhouse scraps, spoiled food destruction, wash water channels, manure tanks
Pulp / Paper		⚙	⚙	Installed in sludge systems, pulp lines and wastewater plants
Heavy Industrial			⚙	Sample grinder installations: refineries, hazardous waste processing, obsolete inventory destruction, recycling

** Consult factory for additional application assistance and approval.*

Materials of Construction

Cutters/spacers models 20000 & 30000: 4130 heat treated alloy steel, surface ground for uniformity and through-hardened to a minimum 45-50 Rockwell "C"

Cutters/spacers model 40000: AR500 hardened alloy steel

Shafts: 4140 heat treated hexagonal steel

End Housings, Covers and Flanges: Cast from ASTM A536 ductile iron

Seal Faces: Tungsten Carbide / Tungsten Carbide

Side Rails: Cast from ASTM A536 ductile Iron

Elastomers: Buna N®



Mini Monster

Model 20000

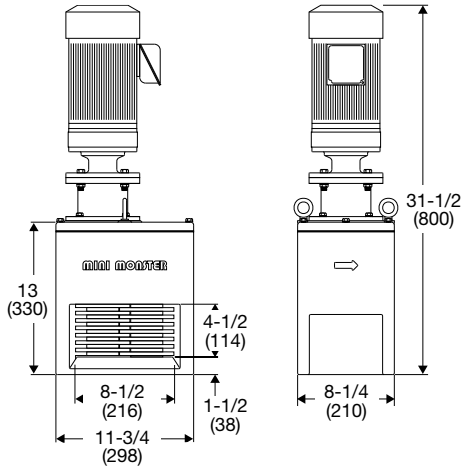
Motor: Standard 3 HP (2.2 kW); optional 1 HP (.7 kW)

Flow rate: **In-line**: 265 GPM (60 m³/h)
Open Channel: 80 GPM (18 m³/h)

Pressure: 90 PSI (6 bar)

Weight: **In-line**: 275 lbs (125 kg)
Open channel: 225 lbs (102kg)

Cutter size: 4-3/4" (120mm) diameter cutters
Max cutting force at tooth tip: up to 6,150 lbs (27.4 kN)



Open Channel Configuration

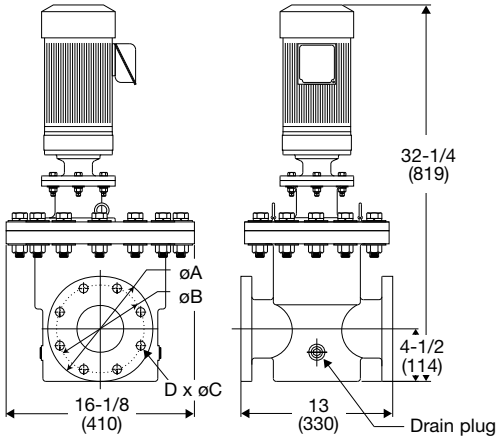
Removable Cutter Cartridge



In-Line Unit



Open Channel Unit



In-Line Configuration

	ANSI B16.42 CLASS 150	BS EN 1092	AS 2129 1998	JIS 2210 10K
	4" Flange Size	100 MM PN 10 FLANGE	100 MM TABLE D FLANGE	100 MM FLANGE
A	9"	220	215	210
B	7-1/2"	180	178	175
C	3/4"	18	18	19
D	8	8	4	8

All dimensions in millimeters unless otherwise noted.



Removable Mini Monster cartridge



Removable Muffin Monster cartridge



Muffin Monster in a pump station



Macho Monster grinds screenings

Removable Cutter Cartridge

Muffin Monster

Model 30000

Specifications: 2” (50mm) hex shaped shafts; 3 HP (2.2 kW) motor standard; 29:1 reducer; hex shaped, tungsten face seal cartridges

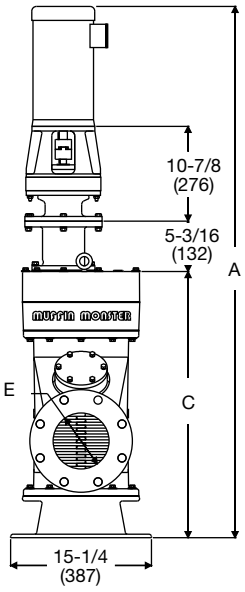
Cutter size: 4-3/4” (120mm) diameter cutters
Max cutting force at tooth tip: up to 9,150 lbs (40.7 kN)

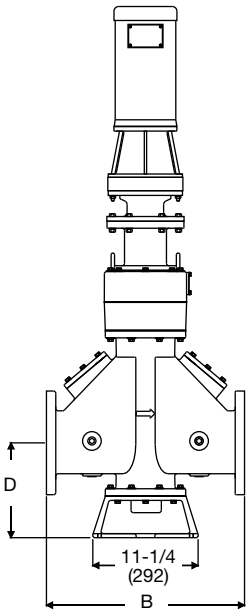


In-Line Unit

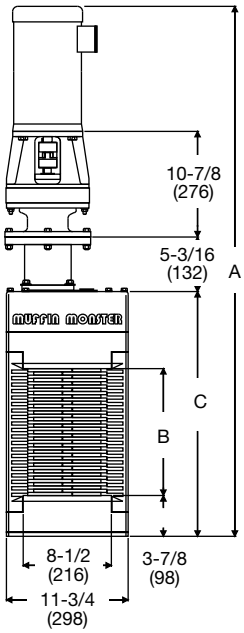


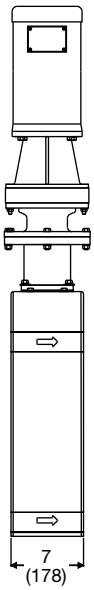
Open Channel Unit





In-Line Configuration





Open Channel Configuration

Performance Capability – Open Channel Configuration

Model	Flow Rate GPM (m³/h)	Head Drop inches (mm)	Approximate Net Weight lbs (kg)	Dimensions - inches (mm) A	B	C
30005-0008	335 (76)	9-1/2 (241)	370 (168)	48 (1219)	8 (203)	19-1⁄2 (482)
30005-0012	490 (111)	13-1/2 (343)	410 (186)	52-1⁄8 (1320)	12 (305)	23-5⁄8 (584)
30005-0018	740 (168)	17-1/2 (444)	465 (211)	58 (1473)	18 (457)	29-1⁄2 (736)
30005-0024	1000 (227)	19-1/2 (495)	520 (236)	63-3⁄4 (1600)	24 (609)	35-1⁄4 (889)
30005-0032	1470 (334)	21-1/2 (546)	580 (263)	71-1⁄2 (1803)	32 (813)	43 (1092)
30005-0040	2000 (454)	23-1/2 (597)	650 (295)	79-1⁄2 (2006)	40 (1016)	51 (1295)

Flow based on optimum channel conditions • Consult factory for final analysis of application • Dimensions based on 3 HP (2.2kW) electrical motor drive

Performance Capability – In-Line Configuration

Model	Flow Rate GPM (m³/h)	Pipeline Size inches (mm)	Pressure Drop PSI (bars)	Approx. Net Wt. lbs (kg)	Dimensions - inches (mm) A	B	C	D	E
30004T-1204	400 (91)	4 (102)	0.42 (0.03)	550 (250)	56-1⁄4 (1423)	19-1⁄4 (483)	28-1⁄4 (711)	8-1⁄8 (206)	4 (102)
30004T-1206	600 (136)	6 (152)	0.86 (0.06)	560 (254)	56-1⁄4 (1423)	21-1⁄4 (534)	28-1⁄4 (711)	9-1⁄8 (232)	6 (152)
30004T-1208	800 (182)	8 (203)	1.60 (0.11)	570 (258)	56-1⁄4 (1423)	23-1⁄4 (584)	28-1⁄4 (711)	10 (254)	8 (203)
30004T-2410	1000 (227)	10 (254)	1.22 (0.08)	785 (356)	67-3⁄4 (1727)	27-1⁄4 (686)	39-3/4 (1010)	11-1⁄2(283)	10 (254)
30004T-2412	1200 (273)	12 (305)	1.59 (0.11)	810 (367)	67-3⁄4 (1727)	31-1⁄4 (787)	39-3/4 (1010	12 (305)	12 (305)

In-Line unit typically installed prior to suction side of pump.

Macho Monster

Model 40000

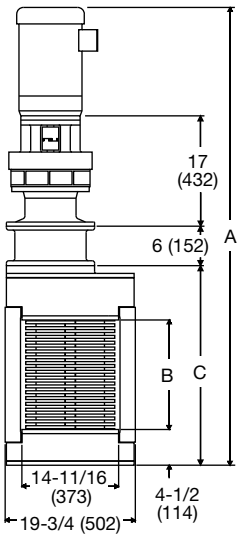


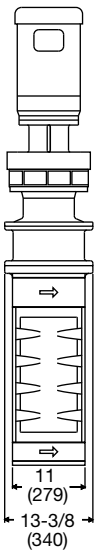
In-Line Unit



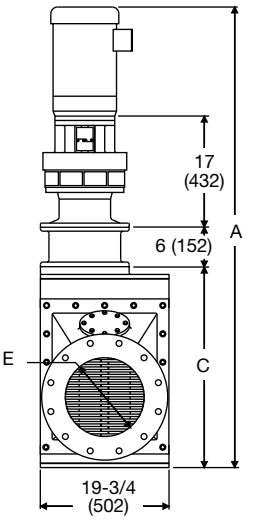
Open Channel Unit

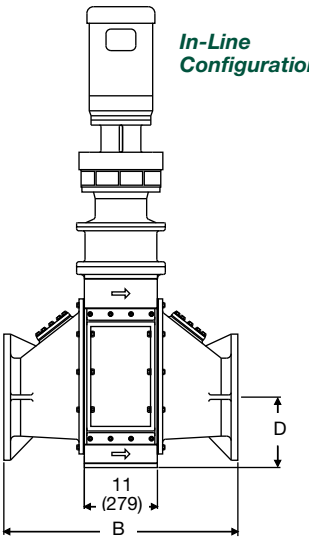
Open Channel Configuration





In-Line Configuration





Specifications: 2.5" (60mm) hex shaped shafts; 10 HP (7 kW) motor standard or 5 HP (3.7 kW) optional; 43:1 reducer; hex shaped, tungsten face seal cartridges

Cutter size: 7-1/2" (190mm) diameter cutters
Max cutting force at tooth tip: up to 16,200 lbs (72.1 kN)

Performance Capability - Open Channel Configuration

Model	Flow Rate GPM (m^3/h)	Head Loss inches (mm)	Approximate Net Weight lbs. (kg)	Dimensions inches (mm) A	B	C
40000-0018	900 (204)	8 (203)	1175 (533)	69-1/4 (1754)	18 (457)	30-1/4 (768)
40000-0024	1500 (341)	16 (404)	1365 (619)	75 (1905)	24 (609)	37-1/4 (946)
40000-0032	2100 (477)	18 (457)	1560 (708)	76-1/4 (1937)	32 (812)	76-7/8 (1444)

Performance Capability - In-Line Configuration

Model	Flow Rate GPM (m^3/h)	Pressure Drop PSI (bar)	Approximate Net Weight lbs (kg)	Dimension inches (mm) A	B	C	D	E
40000-1812	2500 (500)	3.00 (.207)	1520 (690)	69-1/4 (1759)	35-1/4 (895)	30-1/4 (768)	10-3/4 (273)	12 (305)
40000-2412	3000 (681)	1.12 (.077)	1775 (805)	76-1/4 (1937)	35-1/4 (895)	37-1/4 (946)	10-3/4 (273)	12 (305)
40000-2416	3500 (795)	1.50 (.103)	1895 (860)	76-1/4 (1937)	43-1/4 (1099)	37-1/4 (946)	12-5/8 (321)	16 (406)
40000-2418	4000 (908)	2.20 (.152)	2095 (950)	76-1/4 (1937)	47-1/4 (1200)	37-1/4 (946)	13-5/8 (346)	18 (457)
40000-3220	5000 (1136)	3.00 (.207)	2610 (1184)	82-3/4 (2102)	51-1/4 (1301)	43-7/8 (1114)	15 (381)	20 (508)

** Notes: Flow based on optimum channel conditions. Consult factory for final analysis of application. In-Line unit typically installed prior to suction side of pump.*

Muffin Monster Options



Hardened steel cutters

Cutters

- Various cutter options maximize grinding efficiency
- Special: 3-tooth fish grinding cutter
- Custom: extra-hard carburized cutters; stainless steel

Custom Frames

- Stainless steel guide frames attach to pump station walls to make installation easy
- Grinder support base, subchannel, overflow bar racks and other frame configurations available



Custom frame

High-tech Controllers

- Standard enclosure: NEMA-4x fiberglass, 3 position switch, indicators
- Optional enclosures: NEMA-4x 304 stainless steel; NEMA-4x 316 stainless; NEMA-7 explosion proof

High Flow Side Rails

- Integrated slots allow more water to flow through the grinder while directing solids into the cutters.



Exclusive: high-flow side rails



Scrapers



Electric motor



Exclusive: high-efficiency immersible motor



Hydraulic motor

Motors

- Electric motor: 3, 5, 10 HP (2.2, 3.7, 7.5 kW)
- Explosion proof electric motor: 3, 5, 10 HP (2.2, 3.7, 7.5 kW)
- Exclusive immersible motor: 3, 5, 10 HP (2.2, 3.7, 7.5 kW)
- Hydraulic motor: 5, 10, 15 HP (3.7, 7.5 kW)

Extended Motor Shaft

- Longer drive shaft puts motor above the highest water level. Available in 6" (150mm) increments.

Scrapers

- Fixed steel scrapers increase material throughput and help cutters clean-out faster.



Extended motor shaft

Service Options

Your Choice of Service Programs

1. **Monster Exchange**: First, a newly re-conditioned grinder is shipped to you; hot-swap the new and old grinders; and finally, ship the used one back to us. That's it you're done. Free labor, one year warranty.
2. **Factory Repair**: Our mechanics will rebuild your grinder good as new. Free labor, one year warranty.
3. **Parts**: Monster original cutters, shafts and seals make a big difference.
4. **Upgrade**: move up to the next generation of Monster grinding technology.



Genuine replacement parts

Headquarters
290 Paularino Ave.
Costa Mesa, CA 92626 USA
Toll Free: (800) 331-2277
Phone: (949) 833-3888
Fax: (949) 833-8858
jwce@jwce.com

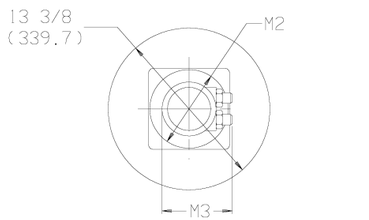
Western Product Support
2600 S. Garnsey St.
Santa Ana, CA 92707, USA
Toll Free: (800) 331-2277
Phone: (949) 833-3888
Fax: (714) 751-1913
jwce@jwce.com

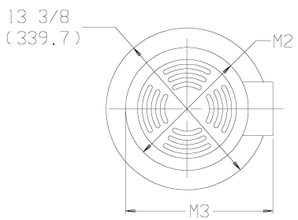
Eastern Product Support
4485 Commerce Dr, Ste 109
Buford, GA 30518, USA
Toll Free: (800) 331-8783
Phone: (770) 271-2106
Fax: (770) 925-9406
jwce@jwce.com

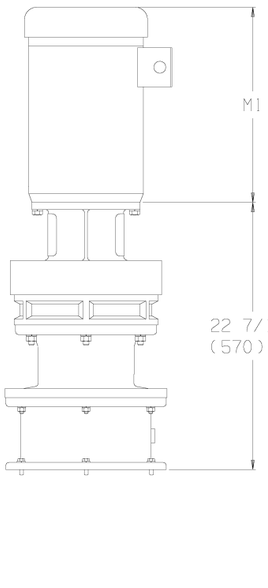
JWC, JWC Environmental, Auger Monster, Channel Monster, Mini Monster, Muffin Monster and Screenings Washer Monster are registered trademarks. United States patents may apply: 4,919,346; 5,060,872; 5,320,286; 5,333,801; 5,354,004; 5,478,020; 5,505,388; 5,593,100; 6,176,443; RE37,550E; 6,332,984, RE37,349; 09/576,345; 10/384,759; 10/131,040. Additional and foreign patents pending. **(MM-06-EN)**

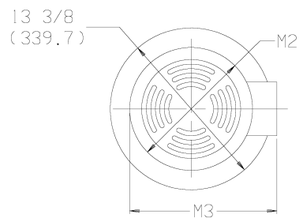
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
ALL	NEW	INITIAL RELEASE	09-20-01	4-0165 CG
ALL	A	REVISED DIM TAB BLOCK	10-23-01	4-0166 RS
A4;A6	B	SEE ECO FOR CHANGES.	09-28-04	4-0206

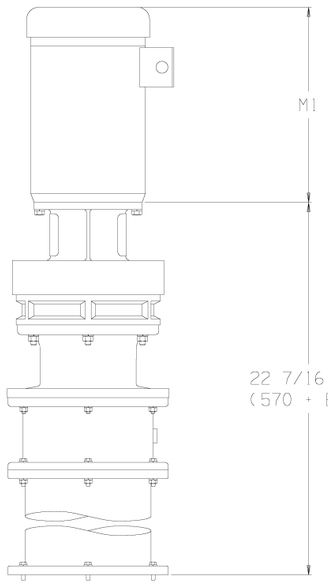
AVAILABLE SHAFT EXTENSIONS																		
DIM E	12 (305)	18 (457)	24 (610)	30 (762)	36 (914)	42 (1069)	48 (1219)	54 (1372)	60 (1524)	66 (1676)	72 (1829)	78 (1981)	84 (2134)	90 (2286)	96 (2438)	102 (2591)	108 (2743)	114 (2896)	120 (3048)

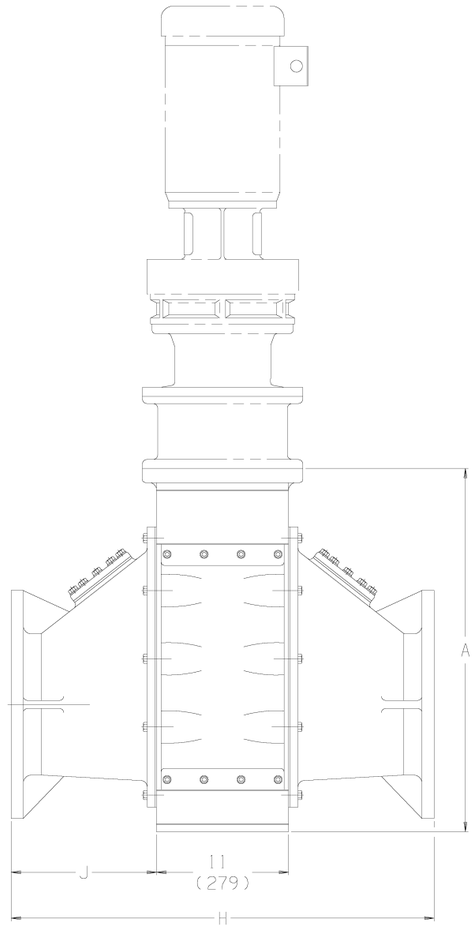


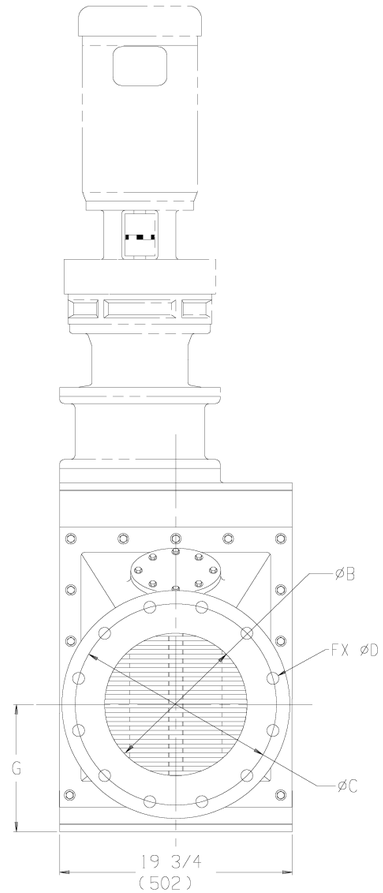












TAB BLOCK I			
ELECTRIC	M1	M2	M3
5 HP			
TEFC	14 (356)	8 7/8 (225)	11 1/4 (286)
SUPER-E	13 3/8 (340)	9 (229)	12 (305)
TEXP	16 1/4 (413)	9 (229)	12 (305)
CHEM PRCS EXTRM SRVC	14 1/4 (362)	10 1/4 (260)	12 1/4 (311)
10 HP			
TEFC	16 7/16 (418)	10 3/8 (264)	12 5/8 (321)
SUPER-E	15 7/8 (403)	10 3/8 (264)	14 7/16 (367)
TEXP	17 1/4 (438)	10 3/4 (273)	15 1/8 (384)
CHEM PRCS EXTRM SRVC	16 11/16 (424)	12 1/8 (308)	14 15/16 (379)
HYDRAULIC			
TORQUE MOTOR	7 1/4 (184)	7 1/4 (184)	5 7/16 (138)

TAB BLOCK II								
DIMENSIONS								
MODEL	A	B	C	D	F	G	H	J
40002-1812	30 1/4 (768)	12 (300)	17 (432)	1 (25)	12	10 3/4 (273)	35 1/4 (895)	12 1/8 (308)
40002-2412	37 1/4 (946)	12 (300)	17 (432)	1 (25)	12	10 3/4 (273)	35 1/4 (895)	12 1/8 (308)
40002-2416	37 1/4 (946)	16 (400)	21 1/4 (540)	1 1/8 (29)	16	12 5/8 (321)	43 1/4 (1099)	16 1/8 (410)
40002-2418	37 1/4 (946)	18 (450)	22 3/4 (578)	1 1/4 (32)	16	13 5/8 (346)	47 1/4 (1200)	18 1/8 (460)
40002-3220	43 7/8 (1114)	20 (508)	25 (635)	1 1/4 (32)	20	15 (381)	51 1/4 (1302)	20 1/8 (511)

NOTES: UNLESS OTHERWISE SPECIFIED

1. E = OPTIONAL EXTENDED SHAFT LENGTH. LENGTH TO BE 6"(152) INCREMENTS. EXTENDED SHAFTS SHALL NOT BE GREATER THAN 10'(3048). CONSULT FACTORY FOR GREATER LENGTHS.

ITEM NO.	QTY. REQD	PART NO.	NOMENCLATURE OR DESCRIPTION	SPECIFICATION OR MATERIAL

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ±1/8 (3) DECIMALS .XX ± .XXX± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN PHONG MAI	7-12-01
CHECKED R.SABOL	7-31-01

JWC ENVIRONMENTAL
2600 South Garnsey, Santa Ana, California 92707

MACHO MONSTER
IN-LINE CONFIGURATION
MODEL 40002

SIZE	CODE IDENT NO.	DRAWING NO.	REVISION
D	53242	40002-IL-CD	B

SCALE NONE SHEET 1 OF 1

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