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Common Response 12: Agricultural Resources

Overview

This Common Response addresses the common themes and topics raised in public comments on Chapter 15, *Agricultural Resources*, of the Delta Conveyance Project (project) Environmental Impact Report (EIR). To address these themes, this Common Response discusses the following.

- Factors driving crop choices in the region.
- Planned use of land reclamation to return some of the farmland within the construction footprint back to productive agricultural use post-construction when possible.
- Resources available in the EIR (i.e., Mapbooks 15-1 through 15-6) that depict the location of the project's temporary and permanent impacts on agricultural land.
- Project compliance with existing water quality standards as they pertain specifically to salinity of irrigation water for agricultural operators within the study area.
- Factors that will be considered during implementation of the mitigation measures identified in Chapter 15 to help ensure that the agricultural lands are protected within the Delta counties to offset the direct conversion of farmland within the Delta during construction of the project.
- Considerations to be made if the California Department of Water Resources (DWR) implements an optional approach of funding farm improvements pursuant to Mitigation Measure AG-1: *Preserve Agricultural Land*.

Crop Choices in the Delta

Current and future crops choices made by agricultural operators are largely driven by market forces that can be highly dynamic. As such, crop choices are effectively private business decisions that are not under DWR's ability to control and, therefore, are outside the scope of the EIR analysis.

The distribution of crop varieties within the study area is essentially a snapshot in time. As per California Environmental Quality Act (CEQA) Guidelines Section 15125, the *Environmental Setting* section of Chapter 15 provides a description of physical environmental conditions as they exist at the time the Notice of Preparation (NOP) is released. DWR analyzed crop distributions in the study area principally based on remote sensing information that was field-verified.

Analyzing the distribution of crop types within the study area provides a basis for evaluating the effects of the project on the potential for agricultural operators to maintain farmland in agricultural use. While the region is currently seeing a trend of crop conversion into orchards and vineyards, there is inadequate information available to answer a series of considerations, including (1) whether this trend is expected to persist into the future, and if so, (2) whether the rate of conversion is expected to continue at its present level or to either accelerate or decelerate. Since future market conditions are difficult to predict, DWR considered it overly speculative to consider an environmental setting that attempted to predict future distributions of certain crop varieties; however, the EIR does acknowledge such conversions were occurring in the years leading up to the NOP.

Land Reclamation

As some comments pointed out, areas where postconstruction land reclamation is planned to occur can be subject to soil compaction, which could degrade its potential value as farmland after construction activities associated with the project in those areas are completed (see the Post-Construction Land Reclamation technical memoranda [Delta Conveyance Design and Construction Authority 2022a, 2022b]). DWR is committed to returning any farmland temporarily converted as part of construction activities and no longer needed for long-term operation of the Delta Conveyance Project back to productive agricultural use or habitat, to the extent feasible. Construction areas of at least 5 contiguous acres of land that do not contain permanent project-related features would be targeted for land reclamation actions. These areas include sites associated with the intakes, tunnel launch shafts, and Southern Complex or Bethany Complex. Areas that were cropland prior to the commencement of construction activities would undergo surface treatments intended to allow the land to be returned to productive agricultural use or grassland habitat. Depending on specific site conditions, some of these areas may be deemed not suitable for a return to active agriculture; such areas would instead be seeded with native grasses with the intent that these areas become native annual grasslands.

Agronomic investigations would be employed to identify methods to minimize the effects of soil compaction due to construction activities and restore the agricultural potential for disturbed farmland. The investigations will start with greenhouse-based treatments. The greenhouse-based treatments would be conducted by an academic organization or horticulture nursery group at an existing greenhouse for a period of approximately 2 to 4 months. Using a small-scale greenhouse testing program would allow a wide range of topsoil and amendment combinations to be evaluated within a short timeframe and, therefore, would identify a smaller number of amendments to use in a larger field-scale study. Site-sourced soil collected from the Twin Cities Complex would be treated with the conditioners expected to be used for the project to create material with properties similar to the reusable tunnel material (RTM) that would be generated during tunnel boring. The soil would be sourced from shallow test pits of the same geologic unit as typical tunnel-depth RTM.

The most-promising greenhouse-based treatments would then be employed for field-scale tests. The field-scale tests would be conducted for a period of 10 to 24 months, implementing the treatments identified during the greenhouse testing that appear most promising. The parcel used for testing would be up to 1 acre in size and would be located within the project footprint at the Twin Cities Complex. Approximately 12 inches of soil would be stripped from a test area, and the removed topsoil would be stockpiled in a separate 0.5-acre area adjacent to the test site. Some of the simulated RTM created for the greenhouse-based treatments would be spread over the test area and divided into test plots. Five randomized and interspersed replicates for each treatment combination and control would be created. Each test plot would be approximately 10 feet wide by 20 feet long to allow the use of ripping, disking, and seeding equipment. Varying amounts of topsoil (e.g., 6 inches, 12 inches, or zero topsoil) would be applied as a secondary treatment factor. Fast-growing, noninvasive grasses or forbs would be seeded in all plots.

Based on the findings of the greenhouse-based and field-scale tests, DWR would determine final reclamation methods and potential transfer of the lands to other parties. For the purposes of mitigation calculations, DWR has conservatively assumed that the reclamation process may not be successful (i.e., the EIR presents a conservative approach to evaluating the magnitude of impacts) (in the Impacts of the Project Alternatives on Farmland Productivity section of Chapter 15, see Impact AG-1: *Convert a Substantial Amount of Prime Farmland, Unique Farmland, Farmland of Local*

1 *Importance, or Farmland of Statewide Importance as a Result of Construction of Water Conveyance*
2 *Facilities*). Nevertheless, DWR is committed to conducting comprehensive testing to maximize the
3 acreage of farmland areas within the construction footprint that can be returned to productive
4 agricultural usage after construction of the project is complete.

5 **Specific Location of Temporary and Permanent Conversion of** 6 **Farmland within the Delta**

7 Some commenters requested additional information regarding the specific location of anticipated
8 farmland properties within the study area that may be temporarily or permanently converted to
9 nonagricultural use. As part of preparation of the Draft EIR, DWR prepared Mapbooks 15-1 through
10 15-6, which show the construction footprint as it relates to the distribution of Important Farmland
11 and farmland properties currently under Williamson Act contract. These mapbooks also identify
12 farmland areas that could have permanent impacts versus temporary surface impacts, which would
13 be affected only during construction. The scale of the mapbooks is adequate to decipher the specific
14 areas of farmland within the construction footprint compared to the figures provided in Chapter 15;
15 the mapbooks are only meant to convey the distribution of Important Farmland types within the
16 broader study area.

17 The dataset used to present the mapping of crop distribution was based on the most current Land IQ
18 data (crop category types are mapped at a field level using ground-truthed remoted sensing
19 analysis) available at the time of the preparation of the EIR (Land IQ 2018). The Land IQ dataset
20 combines integrated crop production knowledge with detailed, field-verified information and
21 multiple satellite and aerial image resources to conduct remote sensing land use analysis at the field
22 scale. Individual fields (i.e., fields of homogeneous crop types, not legal parcel boundaries) were
23 classified into distinct crop categories. Within the study area, there is a discernible trend toward
24 perennial crops (e.g., orchards, vineyards) that generally generate higher value per acre. As stated
25 previously, the distribution of crop varieties within the study area is essentially a snapshot in time.
26 The distribution of crops within the study area is expected to be much more dynamic compared to
27 the distribution of Important Farmland or lands under Williamson Act or within a Farmland Security
28 Zone.

29 **Crop Salinity Tolerances**

30 The purpose of the EIR analysis is to distinguish the effects that the project's operation would have
31 on salinity levels and the project's influence on agricultural resources in the study area, since these
32 effects must be disentangled from the influence of future sea level rise on salinity levels and
33 agricultural resources. As discussed in Appendix 9L, *Water Quality 2040 Analysis*, climate change and
34 sea level rise are primary drivers of water quality changes, including salinity levels, in the study
35 area. Salinity in the western Delta, as measured at the Sacramento River at Emmaton, would
36 increase substantially in the months of July to December, regardless of whether the project is
37 operating (see the *Electrical Conductivity* section of Appendix 9L, *Water Quality 2040 Analysis*). As
38 such, it is reasonable to expect some changes in crop types in the western Delta in future decades, as
39 operators adjust to changing baseline conditions and shift to crop types that are more tolerant of
40 higher salinity levels in applied irrigation water. Such a change in crop types would likely occur
41 regardless of whether any of the project alternatives are implemented.

The modeling for salinity, as measured using electrical conductivity, uses outputs from the Delta Simulation Model II (DSM2), a one-dimensional mathematical model for dynamic simulation of hydrodynamics, water quality, and particle tracking through the Delta. The period of record modeled by DSM2 was 1923–2015, with results presented for the full simulation period and by individual water year types (i.e., wet, above normal, below normal, dry, and critical). Appendix 9G, *Electrical Conductivity*, provides the details regarding each of the Delta assessment locations for which electrical conductivity was modeled under DSM2.

The project's effects on salinity conditions in the Delta are presented in Chapter 9, *Water Quality*. Evaluation of the project operations on the ability to protect agricultural beneficial uses was based on adherence to the State Water Resources Control Board (State Water Board) Water Right Decision 1641 (D-1641) water quality standard. Salinity standards are set by the State Water Board for protection of beneficial uses throughout the entire system. The State Water Board balances a variety of beneficial uses of water, including agricultural use. Future project operations are subject to compliance with D-1641 standards. While some commenters may disagree with the specific values set forth by the State Water Board D-1641 standards, such standards are neither subject to the control of DWR nor within the scope of this project to influence.

Some commenters noted that crop varieties in the study area have been trending over the past decade toward conversion to vineyard and orchard crops, which typically are more sensitive to saline conditions of applied irrigation water. As stated previously, what crops are planted is a business decision made by agricultural operators. Vineyards and orchards are perennial crops that generally are associated with higher economic output than the annual crop varieties they displace; however, their permanence exposes them to additional risk because both long-term future environmental conditions (e.g., availability of freshwater supplies is at growing risk due to climate change) and global commodity prices influencing the planting decisions may substantially shift in the future (e.g., a drop in the price for orchard crops in the future may make these crops less economically viable). Perennial crop types could suffer damage or reduced fruit yields if subjected to irrigation water with salinity levels that exceed crop tolerance levels and there are inadequate freshwater supplies to flush excess accumulated salts from the root zone. Ultimately, the Delta is an estuarine system and historically portions of the western Delta were saline. The gradient of salinity concentrations within the Delta has driven the distribution of crop types in the Delta (in the *Impacts of the Project Alternatives on Farmland Productivity* section of Chapter 15, see Impact AG-3: *Other Impacts on Agriculture as a Result of Constructing and Operating the Water Conveyance Facilities Prompting Conversion of Prime Farmland, Unique Farmland, Farmland of Local Importance, or Farmland of Statewide Importance*; Delta Protection Commission 2020). Areas with fresher water, such as the north Delta along the Sacramento River, are where many orchards and vineyards were planted, whereas the western Delta was more often planted in alfalfa and managed as pasture due to the naturally higher salinity water available in the channels.

Additional comments noted that the salinity tolerances and yield potential analysis presented in the *Environmental Setting* section of Chapter 15 used a reference that was published more than three decades ago (i.e., Ayers and Westcot 1985). During preparation of the Draft EIR, DWR reviewed various sources regarding salinity tolerances that were published more recently but retained the 1985 Ayers and Westcot source because it is commonly cited in discussions at the State Water Board hearings regarding programs and projects that may influence Delta water quality conditions and standards. Furthermore, although advances in agricultural sciences in recent decades have resulted in crop varieties that are more tolerant of saline conditions, DWR retained the reference to the 1985 Ayers and Westcot publication to ensure a conservative characterization of the environmental

setting that ultimately is more protective of agricultural operators in the study area because it avoids assuming that operators have changed to the more salt-tolerant seed varieties.

Feasibility or Effectiveness of Agricultural Resources Mitigation

Under Mitigation Measure AG-1, any permanently affected Important Farmland will be mitigated through a combination of acquisition and dedication of agricultural land, development rights or conservation easements to permanently protect agricultural land, and payment of in-lieu fees to fully fund the acquisition and maintenance of such agricultural land by a third party. Agricultural conservation easements (or similar restrictions on development rights) generally limit subdivision, nonagricultural development, and other uses that are inconsistent with commercial agricultural operations. These agricultural easements are permanent unless they are terminated through eminent domain proceedings. DWR will achieve a minimum 1:1 acreage ratio to directly offset the amount of agricultural lands that are considered a permanent conversion of Important Farmland in the EIR (i.e., those areas taken out of production as a result of construction of the Delta Conveyance Project). The 1:1 ratio assumes that the land to be protected under easements is of equivalent or better quality than corresponding farmland taken out of production. These agricultural conservation easements are to be acquired near the locations of impacts on agricultural land to ensure long-term viability of agriculture in the Delta counties (i.e., Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo).

Agricultural Mitigation Considerations

Equivalent Farmland

DWR considered various factors to evaluate whether future prospective mitigation areas provide an equivalent quality of farmland as the farmland to be permanently converted (i.e., “like for like”). Myriad factors can affect the quality of farmland, including character, productivity, and heritage. When implementing off-site mitigation, it is not possible to completely replicate all the facets of the particular farmland property targeted for conversion. To the extent possible, however, DWR intends to ensure protection of farmland of generally similar qualities, particularly those farmland properties providing the highest level of agricultural productivity. DWR may consider the following individual factors when implementing Mitigation Measure-AG-1.

- Important Farmland status
- Soil quality
- Vulnerability to development
- Location

These factors are described in more detail in the following sections.

Important Farmland Status

The California Department of Conservation designates four farmland types as Important Farmland. A brief description of each of these Important Farmland types follows.

- **Prime Farmland**—Land that has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields.

- 1 • **Farmland of Statewide Importance**—Land similar to Prime Farmland but with minor
- 2 shortcomings, such as greater slopes or less ability to store soil moisture.
- 3 • **Unique Farmland**—Land of lesser quality soils used for the production of the state’s leading
- 4 agricultural cash crops. This land is usually irrigated but may include non-irrigated orchards or
- 5 vineyards as found in some climatic zones in California.
- 6 • **Farmland of Local Importance**—Land that is of importance to the local agricultural economy,
- 7 as defined by each county’s local advisory committee and adopted by its board of supervisors.

8 To be mapped as either Prime Farmland or Farmland of Statewide Importance, the soil must meet
 9 certain physical and chemical criteria, as determined by the National Resources Conservation
 10 Service. Also, the land must have been used for irrigated agricultural production at some time
 11 during the 4 years prior the development of the Important Farmland map update (which is based on
 12 analysis of aerial photos, local comment letters, and available geographical information systems
 13 [GIS] data supplemented with field verification). Both categories represent very high-quality
 14 farmland, with Prime Farmland possessing those qualities that make the land more productive or
 15 more flexible, in terms of supported crop varieties, than farmland mapped as Farmland of Statewide
 16 Importance.

17 Unique Farmland has lesser quality soils compared to lands designated as Prime Farmland or
 18 Farmland of Statewide Importance but is still able to support crop types of particularly high
 19 economic importance to California. Unique Farmland is included as an Important Farmland category
 20 mainly because of its importance in the larger agricultural economy and, more broadly, the
 21 statewide economy.

22 As described previously, Farmland of Local Importance is designated by the respective county’s
 23 board of supervisors and guided by a local advisory committee. Such land generally provides a lower
 24 tier of farmland quality relative to the other three Important Farmland types. DWR was not
 25 obligated to assess impacts on Farmland of Local Importance under the existing CEQA Guidelines.

26 High-quality tiers of farmland are more valuable precisely because they offer landowners or
 27 agricultural operators the greatest flexibility in what can be grown. Decisions to change crop types
 28 may arise from a wide array of factors, including crop yields, crop pricing, input costs, and
 29 compatibility with adjacent farming operations, among many other potential reasons. Therefore,
 30 increased flexibility in how the land can be managed profitably is valuable to the agricultural
 31 community. Given these considerations, DWR determined that any farmland mitigation would need
 32 to protect farmland of equivalent or better quality than the farmland converted as a result of the
 33 Delta Conveyance Project construction and operation.

34 **Soil Quality**

35 Land is classified by the U.S. Department of Agriculture Natural Resources Conservation Service
 36 (NRCS) on the basis of permanent limitations or hazards in keeping the soil productive. Soil
 37 characteristics are considered when evaluating the soil capability class; there are eight different
 38 classes of land. Factors in soil quality that can affect the soil capability class include soil texture, soil
 39 depth, topography, erosion potential, permeability, and runoff potential. Class I through Class IV are
 40 considered to be cultivated classes.

41 Class I lands, which have the highest ranking, are considered to be suitable for cultivation over a
 42 long period of time and have no known limitations that restrict their use. They are typically soils

that are deep, level, moderately well-drained, and subject to minimal erosion. Class II soils are also well suited for cultivation but have some limitations, such as slight erosion or slope, which restrict what types of crops can be grown or require some conservation practices (typically easy to implement) to compensate for the limitations. Class III soils have more severe hazards that limit crop choice and require certain conservation measures which are more difficult to apply, such as terracing. Class IV soils can be cultivated but have known severe limitations such as steep slopes or erodible soils, which restrict the choices of crops that can be grown on them.

The classification of soil reflects both its inherent and dynamic properties, which serve as indicators of soil function. Inherent soil properties change little over time and develop from various soil-forming factors such as climate, topography, parent material, and biota. These inherent properties include soil texture, depth to bedrock, and drainage. Dynamic soil properties are influenced by human management and natural disturbances.

Vulnerability to Development

Agricultural areas that are threatened with a change to a nonagricultural use (e.g., urban development) are considered vulnerable farmland. Protection of vulnerable farmland is often a critical component of a farmland mitigation strategy. For example, while a project may convert farmland in one area (an immediate impact), the mitigation for that project may preclude the likely conversion of farmland at a nearby, off-site location at a future point, thereby reducing the net long-term impact of the project on farmland resources in the region. Vulnerable farmland could also be considered to include areas of nonurban development that can still result in conversion of agricultural lands. In particular, habitat restoration in the Delta region has targeted restoration of tens of thousands of acres—largely requiring the conversion of existing agricultural lands to land covers where agricultural practices can no longer occur, such as tidal wetlands.

Location

Placement of agricultural conservation easements pursuant to Mitigation Measure AG-1 will occur only within the Delta counties. DWR will endeavor to direct mitigation for loss of Delta farmland due to project construction to areas within the Delta whenever possible. Ultimately, DWR will be limited to the locations of willing, participating landowners.

Agricultural Property Improvements

For increased flexibility, Mitigation Measure AG-1 allows an optional approach of funding farm improvements instead of acquiring agricultural conservation easements. This optional approach would be pursued only if it is preferred by interested agricultural interested parties in the Delta. The funding of farm improvements pursuant to compliance with Mitigation Measure AG-1 could also be implemented in conjunction with the acquisition of agricultural conservation easements. Additionally, if there is sufficient interest and if opportunities within the study area exist (e.g., adequate number of willing and interested agricultural landowners), Mitigation Measure AG-1 could feasibly be implemented entirely through this approach of funding farm improvements. DWR would be responsible for ensuring that the funding of farm improvements ultimately contributes to an increase in the extent of Important Farmland present within the study area. Improving acreages of farmland from a non-Important Farmland status to one of the four Important Farmland types as a direct result of DWR's funding farm improvements would reduce the need for acquiring agricultural conservation easements under Mitigation Measure AG-1 at an equivalent 1:1 basis.

Improvements to productivity for an agricultural property not considered to be an Important Farmland type (i.e., Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance) could be implemented in a manner that improves all or part of the property to Prime Farmland or Farmland of Statewide Importance status as shown on subsequent Farmland Mapping and Monitoring Program (FMMP) Important Farmland Maps following completion of such improvements. Such improvements may include providing irrigation infrastructure for agricultural properties (or parts thereof) with soils that meet the NRCS physical and chemical criteria for Prime Farmland or Farmland of Statewide Importance but previously were dryland farmed due to lack of requisite infrastructure. DWR-funded improvements may also include providing improved drainage infrastructure for agricultural properties (or parts thereof) that, based on presence of suitable soil conditions and irrigation infrastructure, could potentially be considered Prime Farmland or Farmland of Statewide Importance but are not mapped as such by the FMMP because they were not used for irrigated agricultural production at any time during the 4 years prior FMMP mapping due to ongoing drainage issues.

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