

1 **3.6 GEOLOGY AND SOILS**

<b>GEOLOGY AND SOILS – Would the Project:</b>	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.6.1 Environmental Setting**

3 The backwater habitat would be created through dry-cutting (dry land excavation) to  
 4 establish a new channel within the Project area. Dry-cutting would involve earthwork  
 5 consisting of excavation, grading, and contouring of the perimeter of the backwater  
 6 channel that would extend from the River to the existing Park Moabi Channel (Figure  
 7 2.4-1). Excavated material would consist of dry fill gathered above the ground water  
 8 elevation. Areas within the footprint of the backwater channel may be excavated until  
 9 the groundwater elevations are reached and further if necessary and feasible.

10 Groundwater elevations within the Project area fluctuate between the depth of 3.5 and  
 11 13 feet with the rise and fall of the River. Excavation would be accomplished through

1 the use of mechanical and hydraulic equipment such as excavators, back hoes, skid  
2 steers, and front loaders.

3 During earthwork and excavation, approximately 1.2 million cubic yards of compacted  
4 fill would be excavated. Dry fill materials would be placed directly adjacent to the newly  
5 excavated channel to bury vegetation debris collected during Phase 1 (Figure 2.4-1).

6 The dry fill material would be soils that are characterized as Salothids and Indio-Silt.  
7 Soil textures within the Project area are a combination of clay to sand depending on  
8 their position in the landscape. The diameter ranges from 0.0625 millimeter (or 1/16  
9 millimeter) to 2 millimeter in diameter. The Project area contains large areas that are  
10 covered with a salt crust and soils that commonly contain salt concentrations. Currently,  
11 this area consists of 146.5 acres of land within a Reclamation dredge spoil area created  
12 as a result of past dredging operations

13 All material excavated within the Project area, located on fee lands of CSLC leased to  
14 the CDFW and the County, would fall under the jurisdiction of CSLC. Ownership of the  
15 dry fill material belongs to the state of California.

16 Hazard overlay maps prepared by the County for the areas do not identify the risk of  
17 seismic activity. Seismic ground shaking is influenced by the proximity of the site to an  
18 earthquake fault, the intensity of the seismic event, and the underlying soil composition.

19 In addition, the area is relatively flat and has been altered by the construction roadways  
20 around the perimeter. The hazard overlay maps do not identify the risk of landslides and  
21 liquefaction. Liquefaction or lateral spreading refers to landslides that commonly form on  
22 gentle slopes and that have rapid fluid-like flow movement, like water.

### 23 **3.6.2 Regulatory Setting**

24 The following Federal and State laws and regulations pertaining to this issue area and  
25 relevant to the Project are identified in Table 3.6-1.

**Table 3.6-1. Laws, Regulations, and Policies (Geology and Soils)**

CA	Alquist-Priolo Earthquake Fault Zoning Act (Pub. Resources Code, §§ 2621-2630)	This Act requires that "sufficiently active" and "well-defined" earthquake fault zones be delineated by the State Geologist and prohibits locating structures for human occupancy across the trace of an active fault.
	California Building Code (CBC) (Cal. Code Regs., tit. 23)	The CBC contains requirements related to excavation, grading, and construction of pipelines alongside existing structures. A grading permit is required if more than 50 cubic yards of soil are moved. Sections 3301.2 and 3301.3 contain provisions requiring protection of adjacent properties during excavations and require a 10-day written notice and access agreements with adjacent property owners.
	California Seismic Hazards	This Act and the Seismic Hazards Mapping Regulations (Cal. Code Regs., tit. 14, Div. 2, Ch. 8, Art. 10) are designed to protect the public from the effects of strong ground shaking, liquefaction, landslides, other ground failures, or other

**Table 3.6-1. Laws, Regulations, and Policies (Geology and Soils)**

Mapping Act (Pub. Resources Code, § 2690 and following as Division 2, Chapter 7.8)	hazards caused by earthquakes. The Act requires that site-specific geotechnical investigations be conducted identifying the hazard and formulating mitigation measures prior to permitting most developments designed for human occupancy. Special Publication 117, <i>Guidelines for Evaluating and Mitigating Seismic Hazards in California</i> (CDC 208), constitutes guidelines for evaluating seismic hazards other than surface fault rupture and for recommending mitigation measures as required by section 2695, subdivision (a).
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1 The following local goals and policies related to geology and soils from the San  
2 Bernardino County 2007 General Plan include (SBC 2007):

3 • Chapter VIII. Safety Element – Section B. Goals and Policies of the Safety  
4 Element:

5 ○ **Goal S 6.** To protect residences from natural and manmade hazards by  
6 utilizing the Hazard and Resources Overlay Maps to identify areas  
7 suitable or required for retention as open space.

8 ○ **Goal S 7.** To minimize exposure to hazards and structural damage from  
9 geological and seismic conditions by:

10 ▪ Designating areas identified by the Alquist-Priolo Earthquake Fault  
11 Zoning Act (Public Resource Code, Division 2, Chapter 7.5) on the  
12 Hazard Overlay Maps to protect occupants and structures from  
13 high level of risk caused by ground rupture during earthquake.

14 ▪ Minimizing damage cause by liquefaction, which can cause  
15 devastating structural damage and a high potential for saturation  
16 exists when the groundwater level is within the upper 50 feet of  
17 alluvial material.

18 ▪ Protecting life and property from risks resulting from landslide,  
19 especially in San Bernardino and San Gabriel Mountains that have  
20 high landslide potential.

21 Regulatory requirement and permits related to this resource area including, but not  
22 limited to, the CWA 404 Permit, National Pollutant Discharge Elimination System  
23 (NPDES), Storm Water Pollution Prevention Program (SWPPP), and Water Quality  
24 Management Plan (WQMP) would be obtained to control soil erosion during and after  
25 construction. Conditions and stipulations required in the permits would be adhered to by  
26 Reclamation.

27 **3.6.3 Impact Analysis (CEQA)**

28 **a) Expose people or structures to potential substantial adverse effects,**  
29 **including the risk of loss, injury, or death involving:**

30 i. *Rupture of a known earthquake fault, as delineated on the most recent*  
31 *Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist*  
32 *for the area or based on other substantial evidence of a known fault?*  
33 *Refer to Division of Mines and Geology Special Publication 42.*

1           **No Impact.** The Project is not located within an Alquist-Priolo Earthquake  
2           Fault Zone according to maps prepared by the California Geologic Survey  
3           or on the County of San Bernardino Geologic Hazards Overlay Surface  
4           Mining and Reclamation Act (SMARA) Overlay Map (California  
5           Department of Conservation 2015a).

6           ii.    *Strong seismic ground shaking?*

7           **Less than Significant Impact.** The Project is not located in the  
8           immediate vicinity of an earthquake fault but like all of Southern California,  
9           large earthquakes can subject land that is not in the immediate vicinity of  
10          an earthquake fault to some degree of seismic ground shaking. Impacts  
11          from seismic ground shaking are forecast to be less than significant  
12          because the site is not located within close proximity of an earthquake  
13          fault.

14          iii.   *Seismic-related ground failure, including liquefaction?*

15          **No Impact.** According to the Geologic Hazards Overlay SMARA Overlay  
16          Map the Project is not located in an area susceptible to liquefaction  
17          (California Department of Conservation 2015a).

18          iv.    *Landslides?*

19          **No Impact.** According to the Geologic Hazards Overlay SMARA Overlay  
20          Map, the Project is not located in an area susceptible to landslides  
21          (California Department of Conservation 2015a). In addition, the Project  
22          area is relatively flat and no new significant slopes will be created.

23          **b) Result in substantial soil erosion or the loss of topsoil?**

24          **Less than Significant Impact.** Development of the Project would require  
25          vegetation removal, grading, and excavation to create the open backwater. The  
26          excavated material would be placed at the adjacent staging area to the east of  
27          the Project area leased by the County. There would be no loss of soil material  
28          within the Project area because the excavated soil material would stay within the  
29          Project area.

30          The Project design includes a re-vegetation plan using native plants to improve  
31          and enhance wildlife and riparian habitat. Although Phase 1, vegetation clearing  
32          activities, and Phase 2, construction activities, would present a potential for soil  
33          erosion, the impacts would be short-term and controlled by having an NPDES,  
34          SWPPP, and a WQMP in place. Preparation of an NPDES, SWPPP, and WQMP  
35          are regulatory requirements and would be obtained by the Applicant. Conditions  
36          and stipulations specific to the Project area would be adhered to, to control soil  
37          erosion during and after construction.

38          The implementation of the Project, specifically during re-vegetation scheduled in  
39          Phase 3, is anticipated to restore and improve site conditions. Following

1 construction of the Project, the restored and improved site conditions would have  
2 no increased potential for soil erosion and would maintain current conditions.

3 **c) *Be located on a geologic unit or soil that is unstable, or that would become***  
4 ***unstable as a result of the project, and potentially result in on- or off-site***  
5 ***landslide, lateral spreading, subsidence, liquefaction or collapse?***

6 **Less than Significant Impact.** As noted in the response to item a) above:

- 7 • Item a, iv) above, the Project site is not susceptible to landslides; thus, the  
8 impacts from lateral spreading are considered less than significant.
- 9 • Item a, iv) above, the Project site is not susceptible to landslides; thus, no  
10 impacts from landslides are forecast to occur.
- 11 • Item a, iii) above, the Project site is not located in an area that is  
12 susceptible to liquefaction.

13 In addition, there is no identifiable risk from a geologic unit that is unstable or soil  
14 that is unstable within the Project area. The proposed design of the open  
15 backwater area does not propose habitable structures so there is no risk from a  
16 geologic unit that is unstable or soil that is unstable.

17 **d) *Be located on expansive soil, as defined in Table 18-1-B of the Uniform***  
18 ***Building Code (1994), creating substantial risks to life or property?***

19 **No Impact.** The Project area is not located in an area which has been identified  
20 by the County Building and Safety Geologist as having the potential for  
21 expansive soils. No impact is anticipated.

22 **e) *Have soils incapable of adequately supporting the use of septic tanks or***  
23 ***alternative waste water disposal systems where sewers are not available***  
24 ***for the disposal of waste water?***

25 **No Impact.** The Project will not require a wastewater system. No impact is  
26 anticipated.

27 **3.6.4 Environmental Consequences (NEPA)**

28 **No Action Alternative**

29 The No Action Alternative would have no effect to Geology and Soils because there  
30 would be no construction to alter the existing conditions of the Project area. The current  
31 use as a designated OHV recreational area would continue and the geology/soils would  
32 remain in its current condition.

33 **Proposed Action (Project)**

34 The Project would be implemented within a location that is relatively flat and outside any  
35 areas at risk for severe seismic activity, liquefaction, and landslides. Although the  
36 implementation of the Project would require vegetation removal, grading, and

1 excavation of an open backwater channel in Phases 1 and 2, soil materials excavated  
2 would be moved within the Project area to the east (leased by the County). It would not  
3 result in the loss of soil material.

4 The Project design includes a re-vegetation plan using native plants to improve and  
5 enhance wildlife and riparian habitat. Although Phase 1, vegetation clearing activities,  
6 and Phase 2, construction activities, would present a potential for soil erosion, the  
7 impacts would be short term and controlled by having an NPDES, SWPPP, and a  
8 WQMP in place. Preparation of an NPDES, SWPPP, and WQMP are regulatory  
9 requirements and would be obtained by the applicant. Conditions and stipulations  
10 specific to the Project area that would be adhered to control soil erosion during and after  
11 construction.

12 The implementation of the Project, specifically during re-vegetation scheduled in Phase  
13 3, is anticipated to restore and improve site conditions. Following construction of the  
14 Project, the restored and improved site conditions would have no increased potential for  
15 soil erosion and would maintain or improve current conditions.

#### 16 **Cumulative Impacts**

17 The OHV use within the Park may contribute to localized soil erosion on previously  
18 disturbed lands. Re-vegetation is expected to restore and improve site conditions that  
19 would have no increased potential for soil erosion and would maintain or improve  
20 current site conditions; therefore, significant cumulative impacts from soil erosion are  
21 not anticipated. No other cumulative impacts are anticipated as there would be no other  
22 potential impacts to the resources evaluated in this section.

#### 23 **3.6.5 Mitigation Summary (CEQA Only)**

24 The Project would result in less than significant impacts to Geology and Soils.  
25 Therefore, no mitigation measure is required.