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Description:	This section describes the soil resources present in the vicinity of the Project Site, as well as the potential impacts that may result from construction and operation of the Project related to soils.
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5.14 Soils

This section describes the soil resources present in the vicinity of the Vaca Dixon Power Center Project (Project), as well as the potential impacts that may result from construction and operation of the Project related to soils. Section 5.14.1 describes the existing environmental setting, including significant soil characteristics. Section 5.14.2 provides an overview of the regulatory setting related to soil resources. Section 5.14.3 identifies potential environmental impacts that may result from Project construction and operation (including maintenance), as well as mitigation measures that should be considered during Project construction and operation. Section 5.14.4 discusses cumulative impacts. Section 5.14.5 presents laws, ordinances, regulations, and standards (LORS) applicable to soil resources. Section 5.14.6 identifies regulatory agency contacts and Section 5.14.7 describes permits required for the Project related to soil resources. Section 5.14.8 provides references for this section.

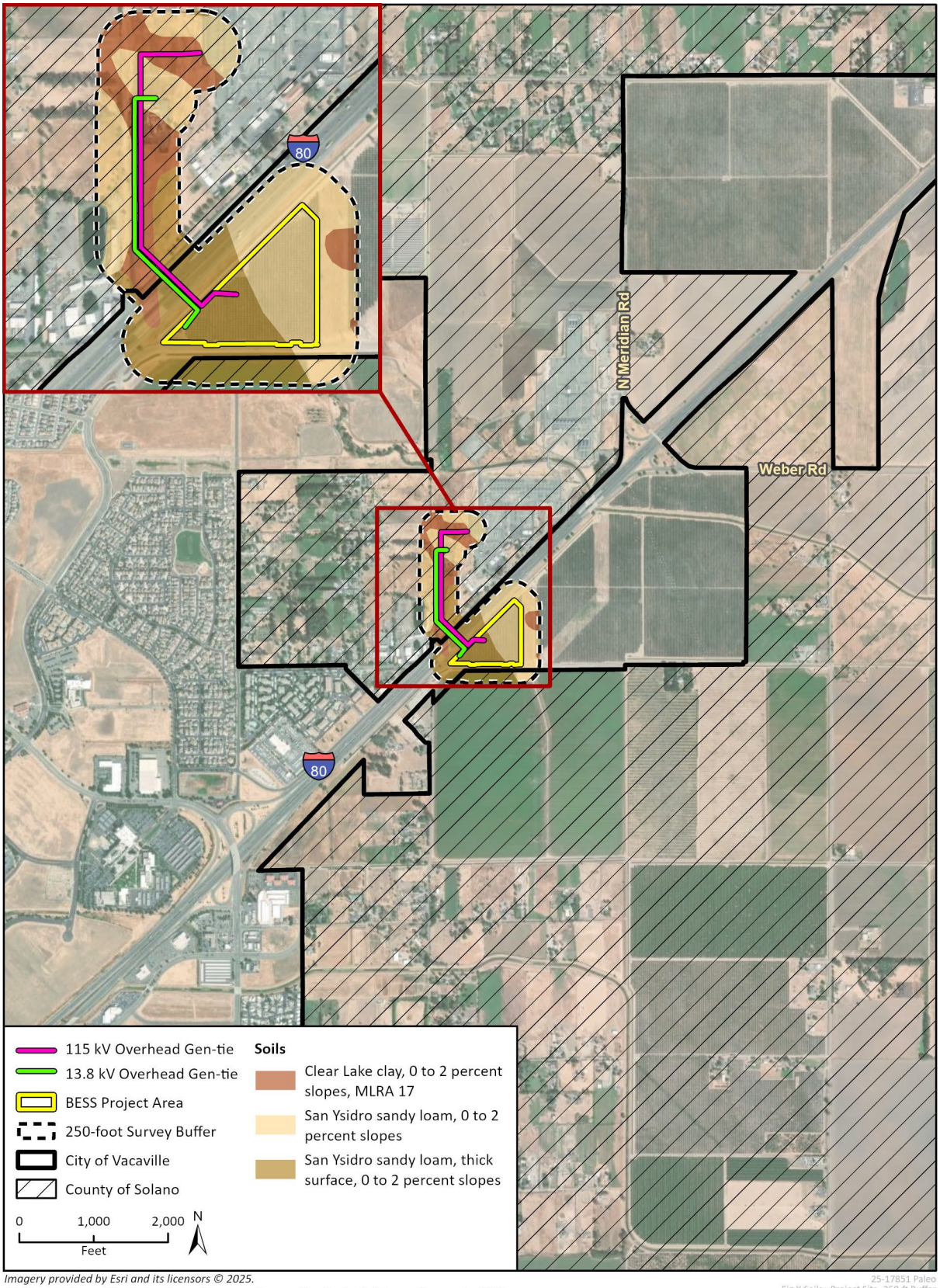
5.14.1 Environmental Setting

A description of the surficial soils within the Project Site, which includes the 10-acre property containing the BESS facilities and the transmission intertie (gen-tie) lines route to the Pacific Gas and Electric Company (PG&E) property, north of the Interstate 80 (I-80), was developed using the Natural Resources Conservation Service (NRCS) online soil survey information and the custom Soil Resource Report of Solano County, within which the Project Site is located (NRCS 2024). NRCS identifies soil map units for the Project Site, which are shown in Figure 5.14-1 and Table 5.14-1 summarizes the depth, texture, drainage, permeability, run-off, land capability class, and other characteristics of the NRCS soil map units underlying the Project Site (NRCS 2024).

In addition, a geotechnical investigation was prepared for the Project Site by Soils Engineering, Inc. (Appendix H). Based on the soil conditions, determined by onsite investigations including 16 boring samples and laboratory testing of onsite soils, the report recommends several measures to ensure structural stability and long-term performance:

- **Excavation and engineered fill.** The upper 2 feet of soil (or 1 foot below proposed foundations) shall be replaced with engineered fill compacted to at least 90 percent of maximum density per Advanced Standards Transforming Markets (ASTM) D1557 to address variability in near-surface soils and improve bearing capacity.
- **Non-expansive fill beneath foundations.** Due to some native soils exhibiting moderate expansion potential, non-expansive engineered fill (Expansion Index < 20) shall be placed beneath shallow foundations and slabs to reduce the risk of heave or shrinkage.
- **Positive drainage.** Proper grading and drainage shall be incorporated to prevent water ponding near foundations, which could exacerbate soil expansion and settlement.
- **Foundation design.** Spread footings are suitable for the site and shall be at least 1 foot deep and designed for an allowable bearing pressure of 2,500 psf; anticipated total settlement is less than 1 inch.
- **Other considerations.** Liquefaction potential is low due to soil composition, but percolation rates are very slow (>60 minutes per inch), indicating poor infiltration. Corrosivity testing shows soils are corrosive to buried metals, so consultation with a corrosion engineer shall be required for protective measures.

Figure 5.14-1 NRCS Soils Overview Map



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Additional data provided by the Natural Resource Conservation Service Soil Survey Geography, 2025.

Table 5.14-1 NRCS Soil Map Unit Descriptions for Project Site

Map Unit	Description
CeA	**Clear Lake clay, 0 to 2 percent slopes, MLRA 17** **Landform:** Basin floors **Parent Material:** Basin alluvium derived from igneous, metamorphic, and sedimentary rock **Typical Profile:** ▪ Ag - 0 to 13 inches: clay ▪ Bssg1 - 13 to 19 inches: clay ▪ Bssg2 - 19 to 45 inches: clay ▪ Bkss - 45 to 60 inches: clay **LEP:** 11.6 **Shrink-swell Potential:** High **Depth:** More than 80 inches **Drainage:** Poorly drained **Permeability:** Moderately low to moderately high (0.06 to 0.20 in/hr) **Runoff class:** High **Capability class:** 2s (irrigated), 4s (nonirrigated) **Taxonomic class:** Fine, smectitic, thermic Xeric Endoaquerts **K-factor:** 0.17
SeA	**San Ysidro sandy loam, 0 to 2 percent slopes** **Landform:** Fan remnants **Parent Material:** Alluvium derived from sedimentary rock **Typical Profile:** ▪ H1 - 0 to 14 inches: sandy loam ▪ H2 - 14 to 28 inches: clay loam ▪ H3 - 28 to 54 inches: sandy clay loam ▪ H4 - 54 to 68 inches: stratified sandy loam to clay loam **LEP**: 4.1 **Shrink-swell Potential:** Low **Depth:** 12 to 20 inches to abrupt textural change **Drainage:** Moderately well drained **Permeability:** Very low to moderately low (0.00 to 0.06 in/hr) **Runoff class:** Very high **Capability class:** 4s (irrigated), 4e (nonirrigated) **Taxonomic class:** Fine, montmorillonitic, thermic Typic Palexeralfs **K-factor:** 0.32

Map Unit	Description
SfA	**San Ysidro sandy loam, thick surface, 0 to 2 percent slopes** **Landform:** Stream terraces, fan remnants **Parent Material:** Alluvium derived from sedimentary rock **Typical Profile:** ▪ H1 - 0 to 14 inches: sandy loam ▪ H2 - 14 to 28 inches: clay loam ▪ H3 - 28 to 54 inches: sandy clay loam ▪ H4 - 54 to 68 inches: stratified sandy loam to clay loam **LEP**: 4.1 **Shrink-swell Potential:** Low **Depth:** 14 to 30 inches to abrupt textural change **Drainage:** Moderately well drained **Permeability:** Very low to moderately low (0.00 to 0.06 in/hr) **Runoff class:** Very high **Capability class:** 3s (irrigated), 4e (nonirrigated) **Taxonomic class:** Fine, montmorillonitic, thermic Typic Palexeralfs **K-factor:** 0.32

MLRA - Major Land Resource Area

LEP - Linear Extensibility Percent

Source: Soil characteristics are based on soil descriptions available on the NRCS's Web Soil Survey (NRCS 2024). Official Soil Series Descriptions and the Soil Survey of Solano County (NRCS 2024). Soil descriptions provided above are limited to those soil units that are present within the Project Site.

5.14.1.1 NRCS Soil Map Units

As shown on Figure 5.14-1 and described in Table 5.14-1, the Project Site contains three NRCS soil map units. The Project Site soils are classified as Clear Lake clay, San Ysidro sandy loam, and San Ysidro sandy loam with a thick surface. These soils are characterized by their varying textures and properties, including clay and sandy loam profiles, low shrink-swell potential, and moderate drainage capabilities. The Clear Lake clay is poorly drained with high shrink-swell potential, while the San Ysidro sandy loams are moderately well drained with low shrink-swell potential.

5.14.1.2 Agricultural Use

As detailed in Section 5.2, *Land Use*, the BESS Project Area is currently used for agriculture and contains a deciduous fruit orchard. The Project Site contains Farmland of Statewide Importance and Unique Farmland. In addition to the onsite agricultural use, the Project Site is bordered to the east and south by agricultural uses. The Project Site abuts the I-80 to the north-northwest. Agricultural use in the vicinity is discussed in more detail in Section 5.2, *Land Use*.

5.14.1.3 Wetlands

An Aquatic Resources Delineation (ARD) was conducted by Rincon Consultants, Inc. to identify the presence of wetlands within the Project Site and a 250-foot buffer. The ARD is provided as Appendix J of the Biological Resources Technical Study (Appendix Y). As shown in Appendix A of the ARD, 10 wetland waters of the state were identified within 250 feet of the Project Site: one within 250 feet of the BESS facilities, and the other nine are within 250 feet of the gen-tie line route. No federally jurisdictional wetlands were identified in the ARD. Wetlands are discussed in more detail in Section 5.12, *Biological Resources.*

5.14.1.4 Potential for Soil Loss and Erosion

Erosion is a natural process whereby soil and weathered rock particles detach and are transported, most commonly by wind or water. This action presents hazards to structures because it removes soils, which can undermine foundational elements, and transports and deposits the eroded material at other locations, which could cover roads, fill in reservoirs, and cause other impairments to infrastructure.

The soil erodibility factor, or K-factor, of the Universal Soil Loss Equation (USLE) and Revised Universal Soil Loss Equation (RUSLE), was used to assess the Project Site's vulnerability to erosion by surface water run-off (sheet and rill erosion). The K-factor is a measure of the susceptibility of soil particles to detach and transport by rainfall and runoff. K-factors range from 0.05 to 0.69, and other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by surface water flows (USDA 2024). Soil erodibility and the associated K-factor ranges are presented below in Table 5.14-2.

Table 5.14-2 Soil Erodibility and K-Factor Ranges

K-Factor Range	Soil Erodibility
0.05 – 0.2	Low
0.25 – 0.4	Moderate
0.45 – 0.69	High

Source: (Michigan State University 2024)

San Ysidro sandy loam has a moderate soil erodibility value and could be susceptible to erosion as a result of human activity (e.g., off-road vehicle use). Clear Lake Clay has a low susceptibility to erosion but can be affected by significant human activities such as grading for construction. These soils are located extensively throughout the Project Site (NRCS 2024). The soils present across the Project Site (Clear Lake Clay and San Ysidro sandy loam) have K-factors of 0.17 and 0.32 (NRCS 2024), which indicates moderate soil erosion potential.

5.14.1.5 Other Significant Soil Characteristics

Other significant soil characteristics that could affect the Project Site include expansive soils, liquefaction risk, and the potential for shallow groundwater and soil contamination.

Expansive Soils

Expansive soils, which are rich in clay minerals like smectite, can swell when wet and shrink when dry, potentially causing structural damage. This action is characterized by a soil's "shrink-swell potential," and can damage building and structural foundations via the differential movement of soil. The geotechnical report prepared for the Project determined on-site soil has very low to medium expansion potential with Expansion Indices ranging from 2 to 59. Soils are considered to be expansive when the Expansion Index result is greater than 20, per ASTM D4829, Expansion Index of Soils (Appendix H).

Liquefaction Risk

The Project Site is not located within a mapped liquefaction zone (California Geological Survey [CGS] 2022). Liquefaction is a process in which saturated soil temporarily becomes fluid during intense and

prolonged ground shaking, or because of a sudden shock or strain. Liquefaction typically occurs in areas with loose sand or silt where groundwater is shallow. Settlement is the vertical compression of the soil structure in response to a load, such as a building or compressive ground shaking in an earthquake. Settlement can be rapidly induced by liquefaction as sediments densify in response to the dissipation of pore water pressures (dewatering). The on-site soils in the upper approximately 51.5 feet below ground surface consist mainly of sandy clay and clayey sand. Based on the soil conditions, liquefaction potential in the upper 51.5 feet is considered to be low (Appendix H). Liquefaction is discussed in more detail in Section 5.16, *Geological Hazards and Resources*.

Potential for Shallow Groundwater

Groundwater was encountered during the field investigation in all borings at depths ranging from 14 to 26 feet below ground surface. According to the Sustainable Groundwater Management Act Data Viewer utilizing Department of Water Resources data, the depth to groundwater in the vicinity of the site was approximately 28 feet below ground surface in the Spring of 2024 (Appendix H).

Soils Percolation and Drainage Potential

Percolation testing conducted as part of the geotechnical investigation found that soils at the Project Site exhibit very low percolation rates, ranging from 43 to greater than 150 minutes per inch. These rates were measured in sandy clay and clayey sand soils at a depth of 5 feet (Appendix H).

Potential for Soil Contamination

The following databases were searched in July 2025 for records related to any known soil contamination at the Project Site:

- State Water Resources Control Board (2024) GeoTracker database (SWRCB 2025);
- California Department of Toxic Substances Control (DTSC) EnviroStor database (DTSC 2025);
- List of active Cease and Desist Orders and Cleanup and Abatement Orders from the State Water Resources Control Board (California Environmental Protection Agency 2025)

Based on a review of the databases listed above, there is no known soil contamination on the Project Site or within 0.5-mile surrounding the Project Site.

Soil Corrosivity

Laboratory testing of soil samples collected from the upper five feet of the Project Site identified minimum resistivity values ranging from 364 to 4,385 ohm-cm. These values suggest that the on-site soils may be corrosive to buried metals (Appendix H).

5.14.2 Regulatory Setting

Federal, state, and local LORS related to soils were reviewed for applicability to the Project. These are detailed in Section 5.14.5, *Laws, Ordinances, Regulations, and Standards*.

5.14.3 Impact Analysis

The following subsections discuss the potential direct and indirect impacts related to soil resources from construction and operation (including maintenance) of the Project.

5.14.3.1 Methodology

To identify and assess the potential for impacts to soil resources, Rincon Consultants, Inc. reviewed publicly available information, including maps, online databases, articles, reports, and published research papers. The primary information sources used include the following:

- Natural Resources Conservation Services soils maps
- Sustainable Groundwater Management Act (SGMA) viewer
- The General Plan for the City of Vacaville
- Safety Element of the General Plan for the City of Vacaville
- Conservation and Open Space of the General Plan for the City of Vacaville
- The Municipal Code for the City of Vacaville
- The General Plan for Solano County
- The Municipal Code for Solano County
- Geotechnical Investigation for the Vaca Dixon 57 MWh BESS (Appendix H)
- California Building Code (CBC)
- Aquatic Resources Delineation (Appendix J of the Biological Resources Technical Study (Appendix Y))

5.14.3.2 Impact Evaluation Criteria

The potential for impacts related to soils were evaluated using the relevant criteria described in the California Environmental Quality Act (CEQA) Environmental Checklist (Appendix G of the CEQA Guidelines). Related to soils, the CEQA Checklist asks, would the Project:

- Result in substantial soil erosion or the loss of topsoil?
- Be located on expansive soil, as defined in Table 18-1-B of the UBC (International Code Council 1994), creating substantial direct or indirect risks to life or property?
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?
- Have a substantial adverse effect on state or federally protected wetlands?

Impact SOI-1

Threshold:	Would the Project result in substantial soil erosion or the loss of topsoil?

Construction and Decommissioning

Less than Significant Impact. Construction of the Project would involve grading, excavation, and demolition of an existing deciduous fruit orchard across a 10-acre site in Vacaville, as well as installation of gen-tie lines constructed from the Arges 400 MWh BESS switchyard and Vaca Dixon 57 MWh BESS switchyard at the BESS Project Area south of I-80 to the PG&E Vaca-Dixon Substation which is located approximately 725 feet north of the Project Site. The Arges 400 MWh BESS gen-tie would connect directly to the PG&E Vaca-Dixon Substation whereas the Vaca Dixon 57 MWh BESS gen-tie line would connect via a transformer at the Vaca Dixon Peaker Plant which is already connected to the PG&E substation. The gen-tie lines would cross the I-80 and would be supported by new shared transmission line structures. Two of these new structures would be located on the

10-acre parcel south of I-80 and the other seven would be located on the parcel north of I-80. These construction activities would disturb surface soils and increase the potential for water and wind erosion, topsoil loss, and sediment transport. The use of heavy equipment may also result in soil compaction, reducing infiltration capacity, and increasing surface runoff.

The Project Site is generally flat, and on-site soils exhibit low to moderate erosion potential, which helps minimize erosion risk. As the disturbed area would exceed one acre, a National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit (Order No. 2022-0057-DWQ) would be required for the Project. Compliance with this permit requires preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), including best management practices (BMPs) such as:

- Silt fencing and erosion control blankets
- Covering stockpiled soils
- Proper waste handling and material storage
- Vehicle maintenance protocols to prevent leaks and spills

Additionally, the Project is subject to Chapter 14.19.244 of the City of Vacaville Municipal Code, which requires adherence to grading standards as listed in the California Building Code. Chapter 14.19.244 also requires a post-construction erosion, sediment, and runoff control plan. This plan would include structural and land treatment measures with defined timing to minimize erosion and runoff. Site monitoring would ensure BMPs are properly maintained throughout construction and decommissioning.

As there would be ground disturbance on the northern parcel of the Project Site, within unincorporated Solano County, the Project would be subject to the post-construction erosion control requirements within Chapter 31 of the Solano County Municipal Code, including implementation of an erosion, sediment and runoff control plan which indicates necessary land treatment, structural measures and timing requirements which would effectively minimize soil erosion, sedimentation and rate of water runoff (Solano County Code Section 31-26).

Fine grained soils have the potential for wind erosion. Wind erosion is greatest when dry, fine sandy material is exposed at the ground surface. The Project would be subject to the Yolo-Solano Air Quality Management District Dust Measures, including:

- Watering exposed surfaces
- Covering haul trucks
- Minimizing equipment idling

With adherence to existing Yolo-Solano Air Quality Management District Measures and the City of Vacaville Municipal Code, impacts related to wind erosion would be less than significant.

With implementation of these regulatory requirements and BMPs, construction and decommissioning would not result in substantial erosion or topsoil loss, and impacts would be less than significant.

Operation

Less than Significant Impact. Operation of the BESS facilities would not involve grading or soil movement, and the Project Site would be stabilized with permanent infrastructure and landscaping, following construction. The erosion potential of on-site soils would remain low to moderate, and no substantial loss of topsoil would be anticipated.

The Project would adhere to both Solano County's and the City of Vacaville's erosion, sediment, and runoff control plans such that operational activities do not contribute to soil degradation. As the Project would not include traditional power plant components (e.g., stacks or cooling towers), the Project would not emit pollutants that could degrade vegetation or soil stability.

Therefore, operational impacts related to soil erosion and topsoil loss would be less than significant under CEQA.

Impact SOI-2

Threshold:	Would the Project be located on expansive soil, as defined in Table 18-1-B of the UBC (International Code Council 1994), creating substantial direct or indirect risks to life or property?

Less Than Significant. The Project Site contains soils with very low to medium expansion potential. To mitigate risks associated with expansive soils, the Project would implement the recommendations of the geotechnical report, including over-excavation of structure areas and placement of engineered fill with EI < 20. Specifically, shallow foundations would be underlain by one foot of non-expansive engineered fill, and concrete slabs would be underlain by two feet of non-expansive engineered fill (Appendix H). These measures would reduce the potential for differential settlement and structural damage, and impacts would be less than significant. Compliance with the Project geotechnical report would ensure construction of these Project components does not directly or indirectly create substantial risk to life or property due to expansive soils, and impacts would be less than significant.

Impact SOI-3

Threshold:	Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?

Potentially Significant Impact. As detailed in Section 5.2, *Land Use*, the 10-acre portion of the BESS Project Area, south of I-80, is currently used for agriculture and contains a deciduous fruit orchard. The Project Site contains both Farmland of Statewide Importance and Unique Farmland. As discussed in Section 5.2, *Land Use*, the Project would involve changes which would result in the conversion of Farmland to non-agricultural uses, and a significant impact may occur. With implementation of Mitigation Measure AG-1, this impact would be reduced to a less-than-significant level under CEQA. Refer to Section 5.2, *Land Use*, for a full discussion of potential impacts related to this impact evaluation criterion.

Impact SOI-4

Threshold:	Would the Project have a substantial adverse effect on state or federally protected wetlands?

Less than Significant. The Project would not affect federally protected wetlands, as none were identified during the ARD. Portions of a state jurisdictional swale and seasonal wetlands fall within close proximity to the Project footprint (Appendix J of Appendix Y). The Project will be designed to avoid direct impacts to these features; however, indirect impacts may occur to these nearby wetlands due to runoff and disturbance. Mitigation Measure BIO-6 requires agency consultation and, if necessary, permitting and compensatory mitigation, reducing impacts to a less-than-significant level under CEQA. Please see Section 5.12, *Biological Resources*, for a full discussion of potential impacts related to this impact evaluation criterion.

5.14.4 Cumulative Impacts

Impacts of the Project would be considered cumulatively considerable if they would have the potential to combine with other past, present, or reasonably foreseeable projects to become significant.

Overall Project

A list of closely related past, present, and reasonably foreseeable projects are provided in Table 5-1 of Section 5, *Environmental Analysis.* The geographic scope for cumulative soils impacts is limited to development sites in proximity to the Project Site. This geographic scope is appropriate for soils because soils impacts, such as erosion and loss of topsoil, can affect adjacent sites but do not typically impact regional areas in a cumulative manner. Soil risks, such as expansive soils, are generally site-specific and depend on localized soil conditions. Development of other projects in the area would increase ground disturbance in the vicinity of the Project Site, which would have the potential to result in erosion and loss of topsoil in the area. However, similar to the Project, cumulative projects would be required to adhere to the NPDES Program, as applicable, and prepare a site-specific SWPPP that includes BMPs to minimize erosion and runoff. The SWPPP would be reviewed and approved by the RWQCB. Adherence to all federal, State, and local programs, requirements, and policies pertaining to soil erosion and soil hazards would reduce cumulative impacts related to soils to a less than significant level.

5.14.5 Laws, Ordinances, Regulations, and Standards

The LORS that may apply to the Project related to soils are summarized in Table 5.14-3. The local LORS discussed in this section are ordinances, plans, or policies of the City of Vacaville.

Table 5.14-3 LORS Applicable to Soils

Jurisdiction	LORS	Applicability	Opt-In Application Reference	Project Conformity
Federal	Clean Water Act, 1972, including amendments	Regulates stormwater and non-stormwater discharges from construction and industrial activities	Impact SOI-1	The Project would comply with the requirements of the Clean Water Act, including amendments, through NPDES compliance.
State	California Environmental Quality Act (CEQA)	Requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of the Project and to reduce environmental impacts to the extent feasible.	Throughout this Opt-In Application	The Project's approval by the CEC would comply with CEQA, as required by the CEC's Opt-In Application process.
State	Porter-Cologne Water Quality Control Act	Regulates discharges of waste to state waters and land	Impact SOI-1	The Project would comply with the requirements set forth in the Porter-Cologne Water Quality Control Act through NPDES compliance.
State	Department of Water Quality, Construction General Permit, SWPPP	Requirements for Application for General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2022-0057-DWQ as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ	Impact SOI-1	The Project would comply with Order 2022-0057-DWQ as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ, and a SWPPP would be prepared for the Project.
State	Central Valley Region Basin Plan	Regulates discharges of waste to Central Valley waters and land	Impact SOI-1	The Project would comply with requirements set forth in the Central Valley Region Basin Plan through NPDES compliance.
State	Table 18-1-B of the Uniform Building Code (ICC 1994)	Regulations for soils and foundations, including standards for defining expansive soils	Impact SOI-2	Project construction would comply with soil and foundation recommendations in accordance with Uniform Building Code requirements.
State	California Building Standards Code (CCR Title 24, Part 2, Chapters 18 and 18A) (2022)	Sets the requirements for general building design and construction	Impact SOI-2	Project construction would comply with building and design recommendations in accordance with CBC requirements.
Local	City of Vacaville General Plan: SAF-P1.1-SAF-P1.12	Requirements for new developments in seismic areas, providing soil information, and mandating geotechnical evaluations	Throughout this Opt-In Application	The Project would conform with applicable Policies in the City of Vacaville General Plan through compliance with recommendations in the geotechnical report.

Jurisdiction	LORS	Applicability	Opt-In Application Reference	Project Conformity
Local	City of Vacaville Municipal Code: Chapters 14.19, 14.26, 14.27, 14.28	Requirements for grading activities, soil disturbance, and runoff control; mandates for erosion prevention measures, stormwater management, and agricultural land preservation	Throughout this Opt-In Application	The Project would conform to applicable City of Vacaville soil-related policies by implementing grading controls, erosion prevention measures, stormwater management practices, and agricultural land preservation consistent with Municipal Code requirements.
Local	Solano County Code of Ordinances: Chapter 6.3 and 31	Standards for permits, grading, excavation, draining, erosion control and water quality	Throughout this Opt-In Application	The Project would adhere to the standards within Chapter 6.3 and Chapter 31 including preparation and implementation of a required erosion, sediment and runoff control plan.
Local	Solano County General Plan: HS. P-12 HS. P-13 HS. P-14 HS. P-15 HS. P-17 HS. P-18 HS. I-20 HS. I-21 HS. I-22	Requirements for new developments in seismic areas, providing soil information, and mandating geotechnical evaluations	Throughout this Opt-In Application	The Project would conform with applicable policies in the Solano County General Plan through compliance with recommendations in the geotechnical report.

Sources: Vacaville General Plan 2015, Vacaville Municipal Code 2025, Solano County Code of Ordinances, Solano County General Plan

5.14.5.1 Federal LORS

Clean Water Act

The Clean Water Act establishes requirements for discharges of stormwater or wastewater from any point source that would affect the beneficial uses of waters of the United States. Section 402 of the CWA effectively prohibits discharges of stormwater from construction sites unless the discharge is in compliance with an NPDES permit. The State Water Resources Control Board (SWRCB) is the permitting authority in California and has adopted a statewide general permit for stormwater discharges associated with construction activity (SWRCB 2022) that applies to projects resulting in one or more acres of soil disturbance. The Project would result in disturbance of more than one acre of soil. Therefore, the Project would need to be covered under the General Construction Permit (SWRCB 2022) and develop and implement a site-specific SWPPP to meet permit requirements. Requirements are described in greater detail in Section 5.13, *Water Resources*.

5.14.5.2 State LORS

California Environmental Quality Act

CEQA requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of the Project and to reduce environmental impacts to the extent feasible. Appendix G of the CEQA Guidelines includes criteria for evaluating potential impacts related to soils.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code, Division 7) is the State law governing water quality of all state waters, including both surface waters and groundwater. Under the Porter-Cologne Water Quality Control Act, SWRCB has the ultimate authority over water quality policy on a state-wide level, and nine RWQCBs establish and implement water quality standards specific for each respective region. The Central Valley RWQCB regulates water quality in the Project area, and the Project would need to meet water quality standards that are identified in the Water Quality Control Plan for the region.

SWRCB Division of Water Quality, Stormwater General Construction Permit

The five-member SWRCB allocates water rights, adjudicates water right disputes, develops statewide water protection plans, establishes water quality standards, and guides the nine RWQCBs in the major watersheds of the state. The joint authority of water allocation and water quality protection enables the SWRCB to provide comprehensive protection for California's waters.

The *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities*, Order No. 2022-0057-DWQ, NPDES No. CAS000002 (Construction Stormwater General Permit), adopted by the SWRCB, regulates construction activity that includes clearing, grading, and excavation resulting in soil disturbance of at least one acre of total land area. The General Construction Permit generally requires that construction sites with one acre or greater of soil disturbance, or less than one acre but part of a greater common plan of development, apply for coverage for discharges under the General Construction Permit by submitting a Notice of Intent for coverage, developing a SWPPP, and implementing BMPs to address construction site pollutants if

the Project is deemed to discharge into a water of the U.S. For the duration of the construction of the Project, BMPs will be implemented in accordance with the Project-specific SWPPP.

Central Valley Region Basin Plan

The Basin Plan (Water Quality Control Plan) for the Central Valley Region establishes water quality standards for the ground and surface waters of the region. The Basin Plan includes an implementation plan describing the actions by RWQCB and others that are necessary to achieve and maintain the water quality standards. The Central Valley RWQCB regulates waste discharges to minimize and control effects of the quality of the region's water, and it is the permitting agency for discharge.

Uniform Building Code

Chapter 18 of the International Building Code and Table 18-1-B of the Uniform Building Code (ICC 2000 and ICC 1997) describe the allowable soil bearing capacity of different types of soils, including expansive soils. Project construction would comply with soil and foundation recommendations in accordance with Uniform Building Code requirements.

California Building Standards Code

The Project is subject to the applicable sections of Title 24, Part 2 of the CBC, which is administered by the California Building Standards Commission. Under state law, all building standards must be centralized in Title 24 to be enforceable. The CBC sets the requirements for general building design and construction requirements relating to fire and life safety, structural safety, and access compliance. CBC provisions provide minimum standards to safeguard life or limb, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings and structures and certain equipment (ICC 2023). The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure—or any appurtenances connected or attached to such buildings or structures—throughout California.

5.14.5.3 Local LORS

City of Vacaville Municipal Code

The City of Vacaville Municipal Code incorporates soil-related regulations through several chapters within its Land Use and Development Code. These provisions establish standards for grading, erosion control, stormwater management, and agricultural land preservation that apply to new development projects, including the Project. Key chapters include:

- **Chapter 14.19 – Grading Regulations:** Establishes requirements for grading permits, slope stability, cut-and-fill operations, and dust suppression. It mandates erosion control measures during construction and requires site-specific plans to minimize soil loss and sedimentation.
- **Chapter 14.26 – Urban Storm Water Quality Management and Discharge Control:** Regulates stormwater runoff from disturbed soils and construction sites. It requires implementation of best management practices (BMPs) to prevent sediment discharge and protect water quality.
- **Chapter 14.27 – Water Efficient Landscaping:** Includes soil preparation standards for new landscaping, such as soil amendments and mulching, to improve water retention and reduce erosion.

- **Chapter 14.28 – Agricultural and Avian Foraging Habitat Impact Mitigation Program:** Requires mitigation for the conversion of designated farmland, including preservation of agricultural soils through conservation easements or in-lieu fees.

Together, these chapters ensure that construction projects maintain soil stability, minimize erosion and runoff, and preserve agricultural resources in accordance with Vacaville's environmental and land use policies.

City of Vacaville General Plan

California Senate Bill 271 and Assembly Bill 2038 required that counties and cities adopt General Plan policies regarding natural hazards. The City of Vacaville's General Plan provides direction for land development and conservation initiatives to foster a sustainable community characterized by a healthy environment, strong economy, and social equity. The City of Vacaville General Plan contains several policies that are applicable to the Project, including, but not limited to:

- **Policy SAF-P1.6:** Require preparation of a soils report prior to issuing a building permit, except where the Building Official determines that a report is not needed.
- **Policy SAF-P1.7:** Require comprehensive geologic and engineering studies of new critical structures, such as hospitals, fire and police stations, utility centers and substations, emergency communication facilities, overpasses, and bridges, regardless of location.

Solano County Code of Ordinances

The Solano County Code of Ordinances largely adopts the CBC with specific edits. Chapter 6.3 – Standards and Code and Chapter 31 – Grading, Drainage, Land Leveling, and Erosion Control includes building and construction requirements to reduce hazard potential that are applicable to all new constructions, including the Project. These requirements include, but are not limited to:

- **Chapter 6.3:** Chapter 6.3 of the Solano County Code establishes building standards and codes to ensure safe construction practices, with a particular focus on soil stability and integrity. It adopts the California Building Standards Code and other uniform codes, setting forth regulations for permits, construction, maintenance, and safety measures. The chapter includes provisions for professional design requirements, inspections, and enforcement to protect public health, safety, and welfare. Specific to soils, it addresses requirements for grading, foundation design, and erosion control to prevent soil erosion, sedimentation, and other related environmental impacts, ensuring that construction projects maintain soil stability and protect downstream waterways and wetlands
- **Chapter 31:** Chapter 31 of the Solano County Code establishes comprehensive regulations for grading, drainage, land leveling, and erosion control to prevent soil erosion and environmental damage. It sets standards for permits, design principles, and best management practices, and outlines procedures for review, approval, inspection, and enforcement. The ordinance mandates the development of erosion control plans and maintenance measures to ensure long-term effectiveness, aiming to protect natural resources and promote sustainable land use. In conjunction with Chapter 70 of the Uniform Building Code, it addresses soil erosion, sedimentation, water runoff, and environmental protection to safeguard public health and welfare.

Solano County General Plan

California Senate Bill 271 and Assembly Bill 2038 required that counties and cities adopt General Plan policies regarding natural hazards. The County of Solano's General Plan provides direction for land development and conservation initiatives to foster a sustainable community characterized by a healthy environment, strong economy, and social equity. The Solano County General Plan contains several policies that are applicable to the Project gen-ties, including, but not limited to:

- **Goal HS. G-1**: Minimize the potential for loss of life and property resulting from natural or human-caused hazards.
- **Policy HS. P-12:** Require new development proposals in moderate or high seismic hazard areas to consider risks caused by seismic activity and to include project features that minimize these risks.
- **Policy HS. P-13:** Review and limit the location and intensity of development and placement of infrastructure in identified earthquake fault zones.
- **Policy HS. P-14:** Identify and minimize potential hazards to life and property caused by fault displacement and its impact on facilities that attract large numbers of people, are open to the general public, or provide essential community services and that are located within identified earthquake fault zones.
- **Policy HS. P-15:** Reduce risk of failure and reduce potential effects of failure during seismic events through standards for the construction and placement of utilities, pipelines, or other public facilities located on or crossing active fault zones.
- **Policy HS. P-17:** Restrict the crossing of ground failure areas by new public and private transmission facilities, including power and water distribution lines, sewer lines, and gas and oil transmission lines.
- **Policy HS. P-18:** Make information about soils with a high shrink-swell potential readily available. Require proper foundation designs in these areas.
- **Policy HS. I-20:** Require geotechnical evaluation and recommendations before new development in moderate or higher-hazard areas. Such geotechnical evaluation shall analyze the potential hazards from: landslides, liquefaction, expansive soils, steep slopes, erosion, subsidence, Alquist-Priolo Earthquake Fault Zones or other identified fault zones, tsunamis, and seiches. Require new development to incorporate project features that avoid or minimize the identified hazards. Costs related to providing or confirming required geotechnical reports will be borne by the applicant.
- **Policy HS. I-21:** Require owners of all existing or proposed oil, gas, water, and sewer pipelines that cross active faults to file an operations plan describing the probable effects of pipeline failure at the fault and the various emergency facilities and procedures that exist to ensure that failure does not threaten public safety.
- **Policy HS. I-22:** Provide current data to the public regarding geologic hazards. Coordinate with cities to gather and periodically assess new geologic data including fault zone activity, landslide activity, and distribution of shrink-swell soils.

5.14.6 Agencies and Agency Contacts

Applicable agency contacts for soils-related permits and approvals are shown in Table 5.14-4. The NPDES permit is discussed in Section 5.13, *Water Resources*.

Table 5.14-4 Agency Contacts for Soils

Issue	Agency	Contact
Erosion control for stormwater discharges associated with construction and decommissioning	Central Valley RWQCB (Region 5)	Nicholas Avdis 916-464-3291 11020 Sun Center Drive, #200 Rancho Cordova, CA 95670-6114 nicholas.avdis@waterboards.ca.gov

5.14.7 Permits and Permit Schedule

A Construction Stormwater General Permit would be obtained for the Project. This permit is listed in Table 5.14-5 and discussed in Section 5.13, *Water Resources*. The Project would not require building and grading permits from the City of Vacaville or County of Solano due to certification through the CEC Opt-In application process.

Table 5.14-5 Permits and Permit Schedule for Soils

Permit	Schedule	Status
National Pollutant Discharge Elimination System (NPDES) *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Construction Stormwater General Permit; Order No. 2022-0057-DWQ	Prior to construction	Discussed in Section 5.13, *Water Resources*
Major Grading Permit	Prior to construction	Permit application will be submitted following completion of CEC Opt-In application process.

5.14.8 References

California Department of Toxic Substances Control (DTSC). 2025. EnviroStor. https://www.envirostor.dtsc.ca.gov/public/ (accessed July 2025).

California Department of Water Resources (DWR). 2025. Sustainable Groundwater Management Act (SGMA) Data Viewer. https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub (accessed July 2025).

California Environmental Protection Agency. 2024. List of "active" CDO and CAO from Water Board. https://calepa.ca.gov/sitecleanup/corteselist/ (accessed July 2025).

California Geological Survey (CGS). 2022. Liquefaction Zones. https://gis.data.ca.gov/datasets/cadoc::cgs-seismic-hazardsprogram-liquefaction-zones-1/about (accessed July 2025).

Eekhout, J. 2022. Global impact of climate change on soil erosion and potential for adaptation through soil conservation. https://www.sciencedirect.com/science/article/pii/S0012825222000058 (accessed July 2025).

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Michigan State University (MSU). 2024. *RUSLE K factor*. http://www.iwr.msu.edu/rusle/kfactor.htm (accessed July 2025).

Natural Resources Conservation Service (NRCS). 2024. Custom Soil Resource Report for Solano County, California.

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