CHAPTER 11
GEOLOGY AND SOILS

11.1 ENVIRONMENTAL SETTING

11.1.1 Topography

Regional Setting

The project site is located in the northeastern Sierra Nevada, which form a generally northeast/southwest-trending mountain range characterized by steep slopes formed by granite rock, faulting, volcanic activity, and glacial action. The Sierra Nevada range extends from the deserts of Southern California and continues up the eastern spine of California, terminating south of the California/Oregon border. The Central Valley lies to the west of the Sierra Nevada range and the California/Nevada border lies to the east, with portions of the mountain range crossing into Nevada. The project site is situated approximately 5 miles northwest of Lake Tahoe and 50 miles east of the Central Valley. The project site is within Bear Creek Valley, which is surrounded on three sides by peaks at least 8,600 feet above mean sea level (amsl) in elevation (Placer County 1968, p. 8). Figure 3-2, Vicinity Map, in Chapter 3 shows the general topography of the area.

Project Site Conditions

The project site has varying topography, and typically slopes moderately to steeply from south to north (Holdrege & Kull 2003, provided in Appendix H to this Draft Environmental Impact Report [EIR]). A low rock knoll is located in the east-central part of the site. Ground surface elevations range from approximately 7,076 feet amsl in the southeast corner of the site to 6,600 feet amsl in the north-central portion of the site. Bear Creek crosses the far western part of the site, and a tributary creek crosses the eastern part of the site (Appendix H).

11.1.2 Geology

Regional Setting

As documented in the Geotechnical Engineering Report and Update for Alpine Sierra (Holdrege & Kull 2003, 2013), which are provided as Appendix H to this EIR, the project site is located in the northern Sierra Nevada geologic province. The geology of the northern Sierra Nevada is dominated by volcanic rocks of Tertiary to Quaternary age. Scott Peak, located to the south of the project site, is composed of Pliocene (later Tertiary) volcanic rock consisting of andesite flows and lahar (mud flow) deposits. During much of Quaternary Period, the nearby crest of the Sierra Nevada was occupied by alpine glaciers that flowed down to what is now Bear Creek and then to the Truckee River (Appendix H).

Project Site Conditions

Much of the project site is underlain by relatively shallow volcanic rock consisting of andesite and lahar deposits. The volcanic rock underlying the project site is slightly older than the volcanic rock that makes up nearby Scott Peak. The northern portion of the site is underlain by Tioga-age glacial till deposits consisting of silty gravel and gravelly sand with numerous cobbles and boulders. The large granitic boulders on site provide evidence of the glacial till deposits. Rock outcrops are present in the southern part of the site, and isolated volcanic rock outcrops are present in the northern part of the site and in John Scott Trail cut, which runs along the northern boundary of the site. Granitic bedrock is present within the stream channel of Bear Creek near the proposed Road A crossing (Appendix H).

11.1.3 Soils

When evaluating potential impacts of development, soils are typically considered for their resource value in agricultural production and for their potential development characteristics and constraints. Some soils are susceptible to erosion and/or expansive behavior, and others are more suitable for compaction for construction.

Regional Setting

Soils found throughout the northeastern Sierra Nevada are derived from weathered granite, which produces fine-grained and well-drained soils.

Project Site Conditions

Holdrege & Kull found that the majority of the topsoil on the project site consists of 4 to 18 inches of dark brown, silty sand topsoil. Underlying the topsoil is a layer of near-surface soil consisting of medium-dense to very-dense silty sand with gravel, and silty sand with gravel containing varying amounts of cobbles and boulders up to approximately 4 feet in diameter. The northeast portion of the project site is underlain by alluvial deposits consisting of sand and gravel with some cobbles and boulders that have been transported to the site by water. Holdrege & Kull report that soils within the project site are well drained and not prone to landsliding (Appendix H). Although Holdrege & Kull did not encounter groundwater during its excavation of test pits, it reported that seasonal saturation of near-surface soils is to be anticipated, particularly during or after seasonal snowmelts and heavy rains (Appendix H). No highly plastic, potentially expansive, or compressible soil is known to be present at the project site (Appendix H).

In addition to Holdrege & Kull's soils assessment, on-site soils have been characterized by their U.S. Department of Agriculture (USDA) soil classifications, as shown in Figure 11-1, USDA Soil Classifications. Soils located in the portion of the site that is north of the proposed

development are shown in Figure 11-1 but are not included in the following descriptions, as this area is proposed to remain as open space.

Near-surface soils at the project site consist primarily of Meiss-Waca complex with 30% to 50% slopes, Jorge-Waca-Cryumbrepts wet complex with 30% to 50% slopes, and Tallac- Cryumbrepts wet complex with 30% to 50% slopes. The narrow southwestern portion of the project site that is bisected by Bear Creek consists of Tinker-Rock outcrop granitic-Cryumbrepts wet complex with 2% to 30% slopes. Minimal amounts of Meiss-Waca complex with 2% to 30% slopes and Jorge-Waca-Tahoma complex with 30% to 50% slopes exist near the southern boundaries of the project site. The descriptions below characterize each of these soil classifications.

During test pit excavations conducted as part of the subsurface field exploration, Holdrege & Kull encountered refusal at depths of 4 to 7.5 feet below the ground surface. The refusal was caused by what was surmised to be large boulders and/or volcanic rock. The quality of the rock varied from moderately weathered to fresh, closely to moderately fractured, and moderately strong to strong. Holdrege & Kull identifies the potential for perched groundwater to develop seasonally above this rock (Appendix H).

11.1.4 Slope Stability

Because the proposed project is located in an area of steep slopes, Holdrege & Kull evaluated the stability of the slopes within and near the project site in the Geotechnical Engineering Report. Unstable slopes have the potential to cause hazards such as landslides, debris flows, rock fall, and avalanches. Regional and project site avalanche conditions are described in Chapter 13, Hazards and Hazardous Materials. The potential for on-site debris flows are described in Chapter 12, Hydrology and Water Quality. Regional and site conditions with respect to landslides and rock falls are discussed in this section.

Regional Setting

The project site is located with mountainous terrain, with steep slopes located both within the project site and in the region of the project site (Appendix H).

Project Site Conditions

Landsliding

Although the project site is located within and near steep slopes, the site soils are relatively competent and are not prone to landsliding (Appendix H).

Rock Fall

The project site has a low potential for rock fall hazard. The parent rock above the project site consists of Lahar (volcanic mudflow) deposits, which generally weather into small, non-spherical boulders that are not prone to rolling down slopes. Holdrege & Kull identified colluvium and large boulders at the base of the slope located above the project site. However, the majority of this material appears to stop before it reaches the project site due to a decrease in slope gradient. Additionally, the existing dense vegetation within and around the project site reduces the potential for rock fall. An intense forest fire in the area would increase the potential for effects related to slope instability.

11.1.5 Seismicity

Regional Setting

The project site is located in a potentially active seismic area. To determine the presence of fault lines in the project vicinity, Holdrege & Kull reviewed four maps of the area prepared by the California Geological Survey (formerly called the California Division of Mines and Geology). The maps showed several active and potentially active faults in the area. The California State Mining and Geology Board defines active faults as those that have shown surface displacement within the past 11,000 years, and potentially active faults as those that have ruptured between 11,000 and 1.6 million years ago. The active and potentially active faults in the vicinity of the project site according to the four maps reviewed by Holdrege & Kull are as follows:

- **Dog Valley Fault** – Active; generally 12 miles northwest of the project site
- **Polaris Fault** – Active; generally 8 miles to the southeast of the project site
- **West Tahoe–Dollar Point Fault** – Active; generally 8 miles southeast of the project site
- **West Tahoe Fault** – Active; generally 8.7 miles southeast of the project site
- **Unnamed fault** – Active; generally 8 miles to the northeast of the project site
- **Unnamed fault** – Potentially active; located approximately 10 miles northeast of the project site

Additionally, the Tahoe Sierra Frontal Fault Zone (TSFFZ) is located in the vicinity of the project site. This fault zone trends sub-parallel to the crest of the Sierra Nevada and runs generally from Lake Tahoe to an area north of Donner Summit. Holdrege & Kull note that a report published by the Geological Society of America Bulletin in 2012 concluded that the TSFFZ is potentially active and may be considered active. Research regarding the TSFFZ is ongoing. The earthquake reoccurrence interval for this fault zone is several hundred to several

thousand years. Thus, Holdrege & Kull determined that the potential for fault rupture is present but not likely.

The project site is not located within or near an Alquist-Priolo active fault zone (Appendix H).

Project Site Conditions

The project site has the potential to experience hazards relating to surface rupture or strong ground motion resulting from the regional faults listed above and from faults that trend near or within the project site.

Holdrege & Kull identified the TSFFZ as trending near or through the southwest corner of the project site. Additionally, the geologic maps reviewed by Holdrege & Kull depict the TSFFZ in a variety of places near or within the project site, and some of the maps also depict the potential for other unnamed faults within or near the project site. The maps reviewed by Holdrege & Kull and their respective identification of faults within and near the project site are as follows:

A 1992 California Division of Mines and Geology map (Geologic Map of the Chico Quadrangle, California) and a 2005 California Geological Survey map (Geologic Map of the Lake Tahoe Basin, California and Nevada) show the TSFFZ trending west of the proposed building sites, concealed beneath glacial till deposits.

A 2012 California Geological Survey map (Geologic Map of the North Lake Tahoe-Donner Pass Region, Northern Sierra Nevada, California) shows an accurately located fault trace trending through the western portion of the project site and an approximately located, discontinuous fault trace trending through or near the northeast corner of the project site.

A 2010 California Geological Survey map (Fault Activity Map of California) shows the TSFFZ trending in a general northwest direction to the east of the project site and identifies this fault zone as potentially active. This map also identifies two fault traces designated as potentially active or of indeterminate activity that trend through the southwest corner of the project site.

As part of its evaluation of the potential for on-site faults, Holdrege & Kull conducted a site-specific evaluation of the project site via a site reconnaissance and a review of aerial photographs and aerial topography. Holdrege & Kull found evidence of fault traces to the north and south of the project site, as indicated by contact between different rock types and by topographic features such as gullies. Within the project site, Holdrege & Kull found no prominent fault scarps, ponds, or depressions that are indicative of active faulting, and also found no evidence of the fault line that was identified beneath the glacial till deposits in the 1992 California Division of Mines and Geology map and in the 2005 California Geological Survey map.

Holdrege & Kull determined that regional faults, such as the West Tahoe Fault, would likely produce stronger ground motion on the site than would the smaller fault traces that are mapped closer to the project site. Although the TSFFZ is mapped as an active or potentially active fault within or near the project site, Holdrege & Kull states that the potential for surface rupture resulting from this fault is relatively low in a given year (Appendix H).

Liquefaction

Liquefaction is the transformation of uncemented, saturated sand or silt to a liquefied state, typically caused by seismic shaking. Liquefaction typically occurs in loose, saturated soils or sediments of primarily sandy composition in the presence of ground accelerations generally greater than 1.98 meters per second (6.50 feet per second). When liquefaction occurs, the material involved has a total or substantial loss of shear strength and behaves like a liquid or semi-viscous substance. The excess hydrostatic pressure generated by ground shaking can result in formation of sand boils, mud spouts, or seepage of water through cracks in the ground. On sloping ground, liquefaction usually results in slope failure. Liquefaction can cause structural distress or failure as a result of settlement, a loss of bearing capacity in the foundation soils and sediments, and the buoyant rise of buried structures. The Geotechnical Engineering Report Update prepared for the proposed project indicates a low potential for liquefaction at the project site, and a low potential for lateral spreading (Appendix H).

11.2 REGULATORY SETTING

11.2.1 Federal Regulations

The Clean Water Act, administered by the U.S. Army Corps of Engineers, regulates soils disturbance as it affects wetlands and other waters of the United States. The National Pollutant Discharge Elimination System is a federal regulation intended to protect surface water quality. These regulations may influence the extent and methodology of soil disturbance allowed to occur on site. However, since the intent of these regulations is primarily to protect hydrologic and biological resources, they are discussed in Chapter 6, Biological Resources, and Chapter 12, Hydrology and Water Quality.

11.2.2 State Regulations

Building Codes and Standards

Construction within Placer County (County) is required to conform to the California Building Code (CBC) (California Building Standards Commission 2013), which is based on the International Building Code (IBC) (ICC 2015). The CBC incorporates the IBC and includes numerous more detailed and/or more stringent regulations to reflect conditions specific to

California. Where no other building codes apply, Chapter 18 of the IBC/CBC regulates excavation, foundations, and retaining walls, and Appendix A33 of the IBC/CBC regulates grading activities, including drainage and erosion control, and construction on expansive soils. The proposed project would be required to conform to the applicable adopted building codes in effect at the time building permits are issued.

In addition, Section 19100 et seq. of the California Health and Safety Code requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum seismic safety requirements are set forth in Chapter 16 of the IBC/CBC. The IBC/CBC identifies seismic factors that must be considered in structural design. It provides seismic design and construction standards applicable to Seismic Zones 3 and 4. Zone 4 standards are more stringent than Zone 3 standards, but seismic standards in both zones are more stringent than those generally applied elsewhere in the United States. The project site is located in Seismic Zone 3 of the CBC Seismic Zone Map (Appendix H).

Seismic Safety

The Alquist-Priolo Earthquake Fault Zoning Act was passed by the State Legislature in 1972 to reduce potential earthquake hazards to structures used for human occupancy, primarily by prohibiting construction of buildings used for human occupancy on the surface of active faults.

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface-fault rupture earthquake hazards, including liquefaction and seismically induced landslides. This act requires the California Department of Conservation to identify Seismic Hazard Zones within the state based on the probable seismic shaking exposure and soil conditions in a given area. Areas that may be subject to substantial shaking, or where soil conditions indicate the area may be prone to liquefaction or earthquake-induced landslides, are included in Seismic Hazard Zones.

Both acts require the state to identify areas with substantial risks related to earthquakes and faults. The project site is not located in an Alquist-Priolo earthquake hazard zone (Appendix H), and there are no Seismic Hazard Zones mapped in Placer County (California Geological Survey 2013).

Other State Regulations

Similar to the Clean Water Act, discussed above, the State Water Resources Control Board and California Department of Fish and Wildlife have developed standards and guidelines related to disturbance of hydrologic and biological resources. These standards and guidelines may influence the extent and methodology of soil disturbance allowed to occur on site. In particular, these agencies require the use of best management practices (BMPs) to control soil erosion from entering waterways. Because the intent of these standards and guidelines is primarily to protect

hydrologic and biological resources, they are discussed in more detail in Chapter 6, Biological Resources, and Chapter 12, Hydrology and Water Quality.

11.2.3 Local Regulations

Placer County General Plan

The Placer County General Plan contains a range of goals and policies related to the treatment of geologic and soil resources and safety considerations related to geology and seismicity (Placer County 2013). The scale and extent of grading operations may be affected by the County's basic land use goals and goals related to preserving other resources (especially visual and biological resources). This chapter focuses on the potential impacts to geologic and soil resources, and the potential safety hazards associated with geologic conditions at the project site. The goal listed below is applicable to this analysis of the proposed project's impacts relating to geology and seismicity. The Placer County General Plan does not contain any goals specifically related to preservation of soil resources. An analysis of the project's consistency with general plan policies that support the goal listed below, as well as other goals related to resource protection, is provided in Appendix C, Policy Consistency Analysis, to this Draft EIR.

Goal 8.A: To minimize the loss of life, injury, and property damage due to seismic and geological hazards.

Alpine Meadows General Plan

The Alpine Meadows General Plan (Placer County 1968) does not provide goals, policies, or objectives relevant to the analysis of impacts related to geology, soils, and seismicity.

Placer County Grading Ordinance

The Placer County Grading Ordinance (Placer County 2015) establishes requirements for grading, erosion control, and stormwater management. Development projects must comply with these requirements during grading and construction. The Grading Ordinance is codified in Article 15.48 of the Placer County Code. The primary goals of the Grading Ordinance are to ensure public safety; avoid pollution of watercourses with hazardous materials, nutrients, and sediments caused by surface runoff; and ensure that the intended use of a site for which a grading permit is sought complies with all applicable County and state codes and regulations, including the CBC.

The Grading Ordinance requires a grading permit for most projects within unincorporated Placer County. Grading permit conditions are detailed in Section 15.48.240 of the Placer County Code. These conditions include requirements for control of dust, erosion, sediment, and noise, and for

mitigating adverse environmental impacts identified in any environmental review document. When issuing a grading permit, the County may impose any condition necessary to protect public health and welfare and avoid any hazardous conditions.

Proposed Development Standards

The proposed project-specific Development Standards, provided in Appendix B, provide specific regulations in regard to grading for both project alternatives. They are intended to guide lot development such that grading impacts are limited. Such limits include keeping the overall grading to a practical minimum, prohibiting mass grading, requiring that structures be designed to fit existing slopes on the site, garages and driveways be at street level, and foundation systems should be constructed as stem wall foundations and other foundation systems that minimize overall site impacts though slabs are allowed where the slab-on-grade foundation would step with the site elevation so as to not result in mass grading. The Development Standards provide conceptual grading that both is functional and limits the amount of grading.

The Tentative Subdivision Map for Alternative A, also included in Appendix B, defines the area in which construction is permitted based on property boundary setback and would not prohibit grading areas on building sites with slopes in excess of 30%, which could result in some conflicts with policies of the countywide General Plan that limit grading to areas with slopes of 30% or less. The Tentative Subdivision Map for Alternative B, which is also included in Appendix B, defines the area in which construction is permitted based on property boundary setbacks and further restricts the locations where development can occur on certain lots through implementation of building envelopes. The building envelopes for both alternatives are generally defined by the required lot setbacks and Alternative B would further restrict the possible building envelopes for several lots that include physical constraints on the property, such as visually prominent locations, steep slopes, and avalanche hazard areas. No structures of any kind would be permitted to be constructed outside of the identified setbacks and building envelopes. The building envelopes define the total area on which building could be allowed. These would be further defined for each individual lot when the Development Notebooks are prepared for each project phase. The Development Standards require that each building plan indicate a maximum Limit of Disturbance (LOD), outside of which no equipment or earthmoving equipment is permitted. The LOD must be entirely within the building envelope and the total building footprint must meet the building coverage limits identified in the Development Standards. The LOD for each lot would encompass the building footprint as well as the footprint for all improvements, including accessory buildings, garages, decks, patios, fences, screens, and recreational facilities. The LOD must also identify additional area for the movement of construction equipment and laydowns; however, the Development Standards also call for just-in-time deliveries to limit laydown areas.

11.3 IMPACTS

11.3.1 Significance Criteria

The analysis in the Initial Study (Appendix A) found that the project would have no impact related to the following criteria:

- Would the project be located on expansive soils?
- Would the project destroy, cover, or modify any unique geologic or physical features?

Therefore, these topics are not discussed further in this Draft EIR.

The analysis below evaluates the potential for the project to result in significant geologic- and soil-related impacts related to the following criteria:

- Would the project expose people or structures to unstable earth conditions or changes in geologic substructures?
- Would the project result in significant disruptions, displacements, compaction, or overcrowding of the soil?
- Would the project substantially alter topography?
- Would the project result in a significant increase in wind or water erosion?
- Would the project result in changes in deposition, erosion, or siltation that may modify any water body?
- Would the project expose people to geologic and/or geomorphological hazards (earthquakes, landslides, etc.)?
- Would the project be located on a geological unit or soil that is unstable or would become unstable/exposure to hazards such as landslide, lateral spreading, subsidence, liquefaction, or collapse?

11.3.2 Project Impacts

Impact 11.1

Would the project expose people or structures to unstable earth conditions or changes in geologic substructures?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None	None
Significance after mitigation:	Less than significant	Less than significant

Alternative A Impacts

Site topography is moderate to steep, with elevations that range from ±6,600 feet to ±7,076 feet amsl (Appendix H). According to the Geotechnical Engineering Report (2003) and the Geotechnical Engineering Report Update (2013) prepared for the project site, the granular native soil and rock at the site are suitable for supporting roadways, utilities, and structures. Additionally, the Geotechnical Engineering Report identified that site soil would generally be suitable for reuse as structural fill, given removal of oversized material. No highly plastic, compressible, or potentially expansive soils are known to be located at the site (Appendix H). The majority of earthwork would be completed using conventional construction and trenching equipment. Construction is not expected to alter any geologic substructures on site. With implementation of the excavation and fill placement methods recommended in the Geotechnical Engineering Report and the Geotechnical Engineering Report Update, as well as compliance with the CBC, impacts associated with potential soil instability would be **less than significant**. Residents and structures are not expected to be exposed to unstable earth conditions and no mitigation measures would be required.

Alternative B Impacts

Modifications to the site plan under Alternative B would not substantially alter site grading compared to Alternative A. As with Alternative A, implementation of the excavation and fill placement methods recommended in the Geotechnical Engineering Report and the Geotechnical Engineering Report Update, as well as compliance with the IBC, would be required. The majority of earthwork would be completed using conventional construction and trenching equipment, and construction is not expected to alter any geologic substructures on site. Under Alternative B, residents and structures are not expected to be exposed to unstable earth conditions; impacts associated with potential soil instability would be **less than significant** and no mitigation measures would be required.

Mitigation Measures

No mitigation measures are required.

Impact 11.2

Would the project result in significant disruptions, displacements, compaction, or overcrowding of the soil?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation measures 11.2a through 11.2d	Mitigation measures 11.2a through 11.2d
Significance after mitigation:	Less than significant	Less than significant

Alternative A Impacts

Construction of the 47 single-family residences, 5 secondary dwelling units, and associated infrastructure proposed under Alternative A would require cuts and fills, soil compaction, and construction of retaining walls that would alter the existing landform and soil conditions. The disrupted soil areas may contribute to other project impacts such as increasing dust emissions and degrading the visual character of the project area, as evaluated in other chapters in this Draft EIR. The proposed grading plan for Alternative A is shown on Figures 11-2a and 11-2b.

Earthwork cuts and fills of 20 feet or more would be required during site grading (Appendix H). Cuts associated with site grading would total approximately 41,600 cubic yards, and fills would total approximately 40,300 cubic yards. It is anticipated that due to the presence of rock in the soil, a portion of the cut material will not be suitable for use as fill on site. Based on preliminary site engineering evaluations and the preliminary grading plan, tt is assumed that a total of 3,000 cubic yards of material would be exported off site and 1,500 cubic yards would be imported.

The majority of earthwork would be completed using conventional construction and trenching equipment. The large boulders and less-weathered rock identified on the site during the geotechnical study would require more heavy-duty equipment for excavation. Additionally, excavations for foundations, roadways, and underground utilities that extend into the rock layer identified at depths of 4 to 7.5 feet below the ground surface may require special excavation techniques, such as spot blasting (Appendix H).

Disruption of site soils and topography is an unavoidable result of development of the site. Grading for roadways and building sites and excavations for drainage features and utility infrastructure would result in significant changes to the site's current condition. The Alternative A grading plan would minimize changes in site topography and provide transitions between

graded areas and adjacent properties. The proposed use of sensitive grading techniques would minimize soil disruptions on site.

Mitigation Measure (MM) 11.2a requires implementation of an Erosion Prevention and Sediment Control Plan and implementation of any other conditions included in the grading permit during site grading and construction. MM 11.2b requires preparation of a final Geotechnical Engineering Report to address project construction that must incorporate the specific recommendations of the Geotechnical Engineering Report and the Geotechnical Engineering Report Update identifying construction and design standards that would protect structures from the effects of soil saturation. The final report would be subject to County approval. MM 11.2c and MM 11.2d require that all grading plans conform to the Placer County Grading Ordinance and implement the recommendations of the Geotechnical Engineering Report and the Geotechnical Engineering Report Update.

Implementation of these mitigation measures would minimize the changes to soils associated with project construction, and would ensure that all earthwork on site complies with Placer County's grading standards. Although soil disruption would still occur, making the impact **potentially significant**, the mitigation measures require the use of specific techniques to prevent or minimize indirect effects such as increased dust emissions and sedimentation of waterways. The environmental effects associated with disruptions, displacements, and compaction of soils would therefore be reduced to **less than significant**.

Alternative B Impacts

Construction of the 38 single-family residences, 5 secondary dwelling units, and associated infrastructure proposed under Alternative B would require amounts of cuts and fills, soil compaction, and construction of retaining walls similar to Alternative A. The proposed grading plan for Alternative B is shown on Figures 11-3a and 11-3b. Grading activities would alter the existing landform and soil conditions. The disrupted soil areas may contribute to other project impacts such as increasing dust emissions and degrading the visual character of the project area, as evaluated in Chapter 9, Air Quality, and Chapter 5, Visual Resources, in this Draft EIR. The proposed grading plan for Alternative B (provided in Appendix B) indicates that the same amount of cut and fill would be used as Alternative A; thus, the impacts of Alternative B would remain **potentially significant** and would require implementation of MM 11.2a through MM 11.2d to reduce the impact to **less than significant.**

Mitigation Measures

MM 11.2a: Prior to the approval of Improvement Plans, the project applicant shall submit a Construction Emission/Dust Control Plan to the Placer County Air Pollution Control District. This plan must address the minimum Administrative Requirements

found in Sections 300 and 400 of Placer County Air Pollution Control District Rule 228, Fugitive Dust, and shall include the following requirements:

a. Apply soil stabilizers to inactive areas

b. Replace ground cover in disturbed areas quickly

c. Water exposed surfaces three times daily

d. Reduce speed on unpaved roads to less than 15 miles per hour

e. Manage haul road dust by watering twice daily

MM 11.2b: The Improvement Plan submittal shall include a final geotechnical engineering report produced by a California Registered Civil Engineer or Geotechnical Engineer. The report shall incorporate the specific recommendations in the Geotechnical Engineering Report and the Geotechnical Engineering Report Update identifying construction and design standards that would protect structures from the effects of soil saturation and shall address and make recommendations on the following:

a. Road, pavement, and parking area design

b. Structural foundations, including retaining wall design

c. Grading practices

d. Erosion/winterization

e. Special problems discovered on site (i.e., groundwater, expansive/ unstable soils)

f. Slope stability

g. Fault rupture

Once approved by the Engineering and Surveying Division (ESD), two copies of the final report shall be provided to the ESD and one copy to the Building Services Division for its use. It is the responsibility of the developer to provide for engineering inspection and certification that earthwork has been performed in conformity with recommendations contained in the report.

If the soils report indicates the presence of critically expansive or other soils problems that, if not corrected, could lead to structural defects, a certification of completion of the requirements of the soils report will be required for subdivisions prior to issuance of Building Permits. This certification may be completed on a lot-by-lot basis or on a tract basis. This requirement shall be so noted on the Improvement Plans; in the Covenants, Conditions, and Restrictions

(CC&Rs); in the Development Notebook; and on the Informational Sheet filed with the Final Subdivision Map(s).

MM 11.2c: The applicant shall prepare and submit Improvement Plans, specifications and cost estimates (per the requirements of Section II of the Land Development Manual [LDM] that are in effect at the time of submittal) to the Engineering and Surveying Division (ESD) for review and approval of each project phase. The plans shall show all physical improvements as required by the conditions for the project as well as pertinent topographical features both on and off site. All existing and proposed utilities and easements, on site and adjacent to the project, which may be affected by planned construction, shall be shown on the plans. All landscaping and irrigation facilities within the public right-of-way (or public easements), or landscaping within sight distance areas at intersections, shall be included in the Improvement Plans. The applicant shall pay plan check and inspection fees with the first Improvement Plan submittal. (NOTE: Prior to plan approval, all applicable recording and reproduction cost shall be paid). The cost of the above-noted landscape and irrigation facilities shall be included in the estimates used to determine these fees. It is the applicant's responsibility to obtain all required agency signatures on the plans and to secure department approvals. If the Design/Site Review process and/or Development Review Committee (DRC) review is required as a condition of approval for the project, said review process shall be completed prior to submittal of Improvement Plans. Record drawings shall be prepared and signed by a California Registered Civil Engineer at the applicant's expense and shall be submitted to the ESD in both hard copy and electronic versions in a format to be approved by the ESD prior to acceptance by the County of site improvements.

Conceptual landscape plans submitted prior to project approval may require modification during the Improvement Plan process to resolve issues of drainage and traffic safety.

The applicant shall provide five copies of the approved Tentative Subdivision Map(s) and two copies of the approved conditions with the plan check application. The Final Subdivision Map(s) shall not be submitted to the ESD until the Improvement Plans are submitted for the second review. Final technical review of the Final Subdivision Map(s) shall not conclude until after the Improvement Plans are approved by the ESD. No Building Permits shall be issued until, at a minimum, the Improvement Plans are approved by the ESD.

Prior to the County's final acceptance of the project's improvements, the project applicant shall submit to the ESD two copies of the Record Drawings in digital format (on compact disc or other acceptable media) in accordance with the latest version of the Placer County Digital Plan and Map Standards along with two blackline hardcopies (black print on bond paper) and two PDF copies. The digital format is to allow integration with Placer County's Geographic Information System (GIS). The final approved blackline hardcopy Record Drawings will be the official document of record.

MM 11.2d: The Improvement Plans shall show all proposed grading, drainage improvements, vegetation and tree removal and all work shall conform to provision of the County Grading Ordinance (Ref. Article 15.48, Placer County Code) and Stormwater Quality Ordinance (Ref. Article 8.28, Placer County Code) that are in effect at the time of submittal. No grading, clearing, or tree disturbance shall occur until the Improvement Plans are approved and all temporary construction fencing has been installed and inspected by a member of the Development Review Committee (DRC). All cut/fill slopes shall be at 2:1 (horizontal:vertical) unless a soils report supports a steeper slope and the ESD concurs with this recommendation.

The applicant shall revegetate all disturbed areas in accordance with the Improvement Plans. Revegetation undertaken from April 1 to October 1 shall include regular watering to ensure adequate growth. A winterization plan shall be provided with project Improvement Plans. It is the applicant's responsibility to ensure proper installation and maintenance of erosion control/winterization during project construction. Where soil stockpiling or borrow areas are to remain for more than one construction season, proper erosion control measures shall be applied as specified in the Improvement Plans/Grading Plans. Erosion control shall be provided where roadside drainage is off the pavement, to the satisfaction of the ESD.

The applicant shall submit to the ESD a letter of credit or cash deposit in the amount of 110% of an approved engineer's estimate for winterization and permanent erosion control work prior to Improvement Plan approval to guarantee protection against erosion and improper grading practices. One year after the County's acceptance of improvements as complete, if there are no erosion or runoff issues to be corrected, unused portions of said deposit shall be refunded to the project applicant or authorized agent.

If, at any time during construction, a field review by Placer County personnel indicates a significant deviation from the proposed grading shown on the Improvement Plans, specifically with regard to slope heights, slope ratios, erosion

control, winterization, tree disturbance, and/or pad elevations and configurations, the plans shall be reviewed by the DRC/ESD for a determination of substantial conformance to the project approvals prior to any further work proceeding. Failure of the DRC/ESD to make a determination of substantial conformance may serve as grounds for the revocation/modification of project approval by the appropriate hearing body.

Impact 11.3

Would the project substantially alter topography?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None	None
Significance after mitigation:	Less than significant	Less than significant

Alternative A Impacts

The project site is currently vacant, supports natural topsoil, and consists of moderate to steep topography (Appendix H). This steep topography would necessitate steep constructed slopes and high retaining walls (up to 20 feet in height) as part of Alternative A. The geotechnical study completed for the project site determined that site soils are relatively competent and can be constructed at steep angles, and that cut slopes would be stable in the near-surface rock.

Grading for construction of the on-site roads and construction of retaining walls is shown on Figures 11-2a and 11-2b, Alternative A Grading Plan (Sheets 1 and 2). The project site layout generally reflects considerations related to retaining the existing topography. Grading for Road A could result in disturbance within approximately 25 feet of the edge of pavement. A retaining wall would be created along the majority of Road A, ranging in height from 3 to 20 feet. In isolated pockets along Road A where a retaining wall is not proposed, cut/fill slopes would be stabilized following construction. Fewer retaining walls would be used in the eastern portion of the site, resulting in greater areas of cut/fill slopes that would require stabilization following construction.

Additional grading would occur to prepare building sites for each future residence. The proposed Development Standards prohibit mass grading of each lot and restrict the use of slab-on-grade foundations. Further, adherence to the Placer County Grading Ordinance would ensure smooth transitions to neighboring properties, as shown on Figures 11-2a and 11-2b. These requirements would serve to minimize the potential for a substantial alteration of topography.

Although construction of the project would alter the local topography by creating areas with large cuts and fills, the project would not substantially change the overall topography of the site

and there would be smooth transitions to neighboring properties. Further, the geotechnical analysis concludes that the cut slopes would be stable (Appendix H). For these reasons, impacts associated with alteration of existing topography would be **less than significant** and no mitigation measures would be required.

Alternative B Impacts

Grading for Alternative B is shown on Figures 11-3a and 11-3b, Alternative B Grading Plan (Sheets 1 and 2). As shown, grading for construction of on-site roads under Alternative B would be substantially the same as Alternative A. Additional grading would occur to prepare building sites for each future residence. The proposed Development Standards for Alternative B also prohibit mass grading of each lot and restrict the use of slab-on-grade foundations. These requirements would serve to minimize the potential for a substantial alteration of topography.

Further, adherence to the Placer County Grading Ordinance would ensure smooth transitions to neighboring properties, as shown on Figures 11-3a and 11-3b. While Alternative B would alter the local topography, the overall topography of the site would not be changed and cut slopes would be stable. Therefore, impacts associated with alteration of existing topography would be **less than significant** and no mitigation measures would be required.

Mitigation Measures

No mitigation measures are required.

Impact 11.4

Would the project result in a significant increase in wind or water erosion?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation measures 11.4a through 11.4f	Mitigation measures 11.4a through 11.4f
Significance after mitigation:	Less than significant	Less than significant

Alternative A Impacts

Alternative A would consist of construction of 47 single-family residential units, 5 secondary dwelling units, roadways, drainage features, and utility infrastructure. If areas where soil has been disturbed are left exposed, construction activities could to lead to wind and water erosion. The resulting dust and sediment has the potential to degrade air quality and water quality, making this impact **potentially significant**. However, MM 11.4a through MM 11.4f require that grading and construction conform to the Placer County Grading Ordinance, require the use of

BMPs to minimize wind and water erosion and protect water quality, require implementation of a dust and erosion control plan, require placement of soil stockpiles far from existing residences and protected resources, and require that the applicant obtain a National Pollutant Discharge Elimination System construction stormwater quality permit. With implementation of these measures, the potential for wind and water to cause erosion of site soils would be minimized, and potential erosion impacts caused by project grading would be reduced to **less than significant**.

Alternative B Impacts

Alternative B would consist of construction of 38 single-family residential units, 5 secondary dwelling units, roadways, drainage features, and utility infrastructure. As with Alternative A, construction activities would result in a **potentially significant** impact if erosion occurs where areas of exposed soil are created. Implementation of MM 11.4a through MM 11.4f, as described previously, would also be required under Alternative B to reduce potential erosion impacts caused by project grading to **less than significant**.

Mitigation Measures

MM 11.4a: The project applicant shall implement Mitigation Measure (MM) 11.2c, which requires that Improvement Plans be submitted to and approved by Placer County prior to commencement of site preparation and construction activities.

MM 11.4b: The project applicant shall implement MM 11.2d, which requires all site work to meet the Placer County Grading Ordinance requirements, and identifies requirements for erosion control measures to be included in project Improvement Plans.

MM 11.4c: An Erosion Control Plan shall be prepared and submitted to the Placer County ESD. The Erosion Control Plan shall be submitted no later than 45 days prior to groundbreaking and the applicant shall not break ground prior to approval of the plan. Both the Dust Control Plan and the Erosion Control Plan shall comply with Placer County's Erosion Control standards and the Placer County Grading Ordinance. The plans shall incorporate best management practices (BMPs) for dust and erosion control during construction of site roadways and driveways, and during building pad grading. BMPs to minimize wind and water erosion shall include the following:

1. Timing grading activities to minimize the amount of exposed areas during the wet season, to the extent feasible.
2. Revegetating all areas that have been graded and will remain undeveloped during the rainy season by mid-October. Revegetation shall use native vegetation. Revegetated areas shall be secured from the possibility of erosion.

3. Preventing eroded soil from entering site drainageways through measures such as placement of hay bales or other acceptable materials such as sediment barriers, installation of temporary earth berms, use of fabric silt fences, spreading hay or straw on exposed areas, and/or development of temporary settling areas. Sediment collected at the erosion control sites shall be collected and disposed of once vegetation has become established.
4. Preventing dust emissions through measures such as maintaining an operational water truck on site at all times and applying water to areas prior to and after disturbance to maintain adequate moisture in the soil to avoid dust emissions; suspending construction activities during periods of high winds; installing wind barriers to prevent dust emissions from leaving the project site; restricting vehicle and equipment speed to 15 miles per hour in construction areas; and controlling storage piles by keeping them wet, establishing and maintaining surface crusting, covering with tarp or vegetative cover, or installing wind barriers of 50% porosity around three sides of the pile.

MM 11.4d: Improvement Plans shall show that water quality treatment facilities/BMPs shall be designed according to the guidance of the California Stormwater Quality Association's Stormwater Best Management Practice Handbooks for Construction, for New Development/Redevelopment, and for Industrial and Commercial (or other similar source as approved by the ESD). The Stormwater Quality Design Manual for the Sacramento and South Placer Regions is an additional guidance document that may be used as a reference for post-construction BMPs.

Construction (temporary) BMPs for the project shall include Fiber Rolls (SE-5), Hydroseeding (EC-4), Stabilized Construction Entrance (LDM Place C-4), Straw Bale Barriers (SE-9), Storm Drain Inlet Protection (SE-10), Silt Fence (SE-1), revegetation techniques, dust control measures, and concrete washout areas.

MM 11.4e: Prior to commencement of construction, the applicant shall provide evidence to the Engineering and Surveying Division of a WDID number generated from the State Regional Water Quality Control Board's Stormwater Multiple Application & Reports Tracking System (SMARTS). This serves as the Regional Water Quality Control Board approval or permit under the National Pollutant Discharge Elimination System (NPDES) construction stormwater quality permit.

MM 11.4f: The Improvement Plan(s) shall identify the stockpiling and/or vehicle staging areas with locations as far as practical from existing dwellings and protected resources in the area.

Impact 11.5

Would the project result in changes in deposition, erosion, or siltation that may modify any water body?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation measure 11.5a	Mitigation measure 11.5a
Significance after mitigation:	Less than significant	Less than significant

Alternative A Impacts

Bear Creek traverses the project site at its far western side, and an unnamed tributary creek crosses the eastern portion of the project site (Appendix H). Drainage from the site flows generally south to north. The portion of the project site that is traversed by Bear Creek is proposed to be developed with Road A, which would provide access to the project site from Alpine Meadows Road. Road A would extend across Bear Creek via a proposed "Conspan" bridge, which would minimize any physical changes to the creek bed. The section of the project site that is traversed by Bear Creek would be zoned as open space.

Some residential development would occur near and on the unnamed tributary in the eastern portion of the project site. No development would occur along the trace of the stream. The project proposes a 100-foot-wide easement centered on the stream, in which construction of buildings or structures would be prohibited. Thus, the easement would ensure that development on the site maintains a minimum 50-foot setback from the centerline of the stream, consistent with the requirements of the Placer County Zoning Ordinance Section 7.54.140.D. The four roadways that would cross the stream area would extend over the creek channel via bridges.

Erosion generated during construction or operation of the project could affect water quality in Bear Creek, in the unnamed tributary creek, and in other downstream waterways, making this impact **potentially significant**. During operational conditions, drainage from the project site would be conveyed through level spreaders, infiltration trenches, and other stormwater BMPs that would filter stormwater runoff, as shown on the grading and drainage plan provided in Figures 11-2a and 11-2b (Alternative A Grading Plan) and Figures 11-3a and 11-3b (Alternative B Grading Plan). These stormwater BMPs would minimize the amount of sediment leaving the project site that would have the potential to contribute to off-site soil deposition and siltation of drainageways.

To ensure additional erosion control, MM 11.5a requires that project activities conform to the Placer County Grading Ordinance, create and implement an Erosion Control Plan, and implement BMPs. The combination of these three erosion control methods and practices would

reduce the possibility of an accidental increase in sediment polluting and degrading aboveground waterways. With implementation of these measures, impacts related to the potential for deposition, erosion, or siltation to cause modification of Bear Creek, the unnamed tributary creek, or off-site water bodies would be reduced to **less than significant**.

Alternative B Impacts

Alternative B would also include the 100-foot-wide open space easement centered on the stream in the eastern portion of the site, and would prohibit, through the Development Standards and Design Guidelines (both provided in Appendix B), construction of buildings and structures within the easement. Alternative B would also include four roadways that would cross the stream area using bridges to minimize disturbance to the creek bed, including the crossing of Bear Creek near the entrance to the site.

Alternative B has the same potential as Alternative A to generate erosion during construction or operation that could affect water quality in Bear Creek, in the unnamed tributary creek, and in other downstream waterways, making this impact **potentially significant**. Alternative B would implement the same stormwater BMPs as Alternative A to filter stormwater runoff. To ensure that additional erosion control is achieved, implementation of MM 11.5a, requiring that project activities conform to the Placer County Grading Ordinance, create and implement an Erosion Control Plan, and implement BMPs, would be required under Alternative B. The combination of these three erosion control methods and practices would reduce the possibility of an accidental increase in sediment polluting and degrading aboveground waterways. With implementation of these measures, impacts related to the potential for deposition, erosion, or siltation to cause modification of Bear Creek, the unnamed tributary creek, or off-site water bodies would be reduced to **less than significant**.

Mitigation Measures

MM 11.5a: The project applicant shall implement MM 11.2c and MM 11.2d, which require that all grading and construction be in accordance with the Placer County Grading Ordinance and shown on Improvement Plans, which must be approved by Placer County prior to commencement of construction activities. In addition, the project shall implement MM 11.4c, which requires the creation of an Erosion Control Plan that includes BMPs to limit erosion.

Impact 11.6

Would the project expose people to geologic and/or geomorphological hazards (earthquakes, landslides, etc.)?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A Impacts

Earthquakes have the potential to occur on the project site. The project site is located in the vicinity of several potentially active and active faults. Additionally, a trace of the TSFFZ possibly traverses near or through the southwest corner of the project site, and two state geologic maps show a fault trace trending near or through the eastern or northeastern portion of the project site (Appendix H). The presence of these faults on or near the project site presents the potential for both fault rupture and groundshaking, and the presence of regional fault lines in the vicinity of the project site presents the potential for groundshaking. With respect to the TSFFZ, Holdrege & Kull found that the interval of earthquakes on this fault "is likely on the order of several hundred to thousands of years. Therefore, if the fault is active, the potential for surface rupture in any one year at the site is relatively low. The project area is not located within an Alquist-Priolo Earthquake Fault Zone. Therefore, establishing setbacks along the fault trace as it trends through the southwest corner of the project area is not warranted" (Appendix H).

Both groundshaking and fault rupture are considered significant geologic hazards. However, as discussed above in the Regulatory Setting, the CBC establishes building standards that ensure structures are designed to resist stresses produced by lateral forces caused by wind and earthquakes. Therefore, compliance with the CBC, as required by Placer County standards, would ensure that the potential for groundshaking impacts to occur would remain **less than significant** and no mitigation measures would be required.

Alternative B Impacts

The potential exposure to geologic hazards at the project site would not change under Alternative B. Development would occur in generally the same areas as under Alternative A, and all construction must meet the requirements of the CBC. The potential for groundshaking impacts to occur would be **less than significant** under Alternative B and no mitigation measures would be required.

Mitigation Measures

No mitigation measures are required.

Impact 11.7

Would the project be located on a geological unit or soil that is unstable or would become unstable/ exposure to hazards such as landslide, lateral spreading, subsidence, liquefaction, or collapse?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation measure 11.7a	Mitigation measure 11.7a
Significance after mitigation:	Less than significant	Less than significant

Alternative A Impacts

According to the Geotechnical Engineering Report, the project site contains granular native soil that is capable of supporting the proposed roadways, utilities, and structures. The report identified that no highly plastic, potentially expansive, or compressible soil is known to be present at the site, and the potential for liquefaction and lateral spreading is low (Appendix H).

Although groundwater was not encountered in the test pits that were excavated as part of the geotechnical study, the geotechnical report stated that near-surface soil layers will likely become seasonally saturated. This soil saturation has the potential to cause adverse conditions such as the collection of groundwater in residence crawl spaces, migration of moisture through concrete slabs-on-grade, degradation of asphalt concrete pavements, and contribution to frost heave (upward swelling of soil during freezing conditions) (Appendix H). Given these potential adverse conditions, MM 11.7a requires that a final geotechnical engineering report be prepared and submitted to the Engineering and Surveying Division to ensure that construction within the project site adheres to the recommendations in the Geotechnical Engineering Report and the Geotechnical Engineering Report Update identifying construction and design standards that would protect structures from the effects of soil saturation. Specifically, the Geotechnical Engineering Report and Update provide recommendations for foundation design and materials and management of soil moisture and drainage from each lot. With implementation of MM 11.7a, **potentially significant** impacts associated with near-surface soil saturation would be reduced to **less than significant**.

Alternative B Impacts

The potential soil saturation and associated environmental effects would be the same under Alternative B as Alternative A, and would be a **potentially significant** impact. Implementation

of MM 11.7a would ensure that future construction under Alternative B would not be exposed to soil instability associated with near-surface soil saturation, and the impact would be reduced to **less than significant**.

Mitigation Measures

MM 11.7a: The project applicant shall implement MM 11.2b, which requires that a final geotechnical engineering report produced by a California Registered Civil Engineer or Geotechnical Engineer be submitted to the Engineering and Surveying Division for review and approval with the project Improvement Plans. Further, the final geotechnical engineering report must address pavement and road design, foundations and retaining walls, grading, erosion control, unique site conditions such as groundwater and expansive soils, soil stability, and fault rupture.

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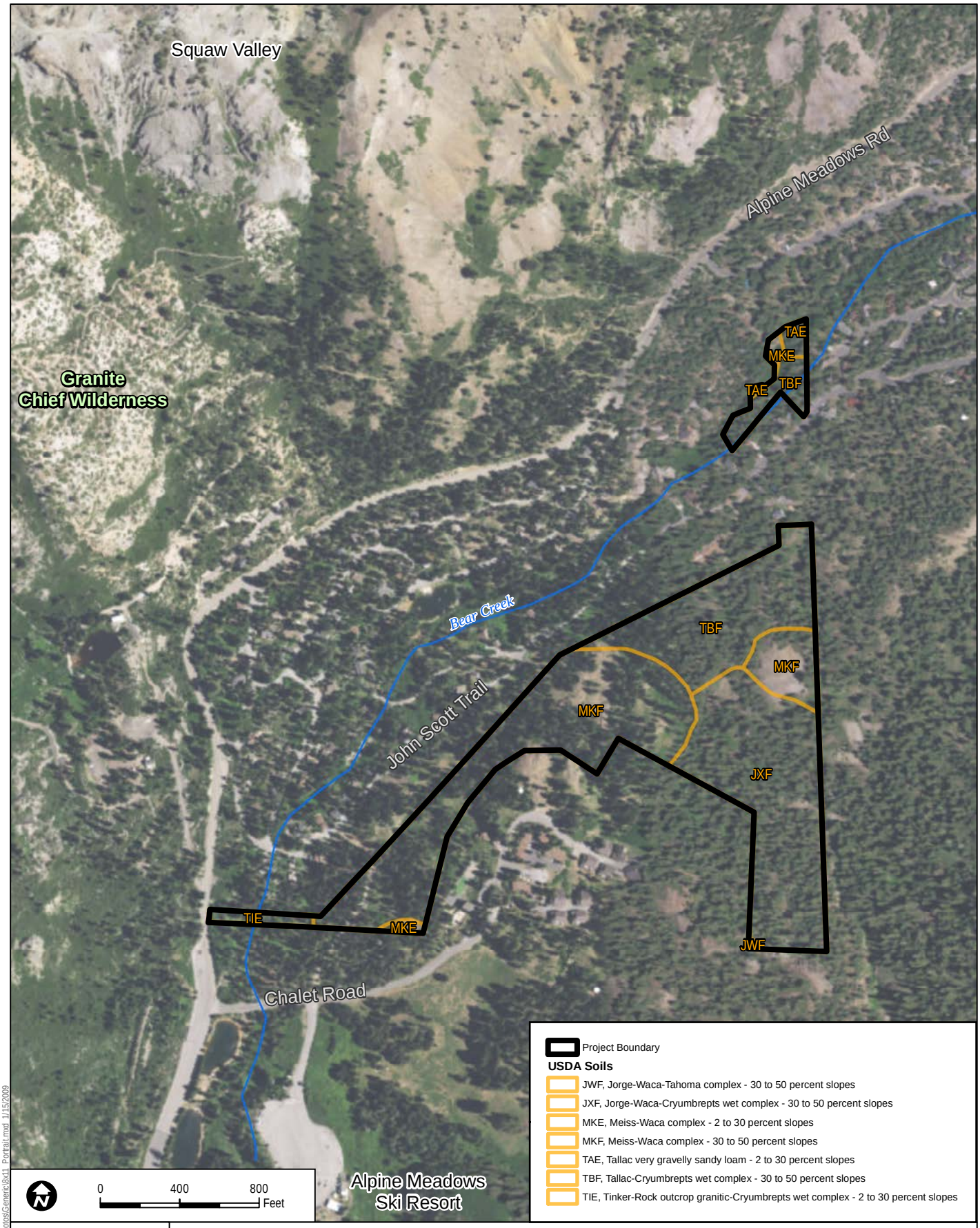

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SOURCE: ESRI 2013, County of Placer 2015, USDA 2007

FIGURE 11-1

USDA Soil Classifications

Alpine Sierra Subdivision - Environmental Impact Report

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ALPINE SIERRA SUBDIVISION

VESTING TENTATIVE MAP

PLACER COUNTY, CALIFORNIA

GRADING & DRAINAGE PLAN

JULY 2014

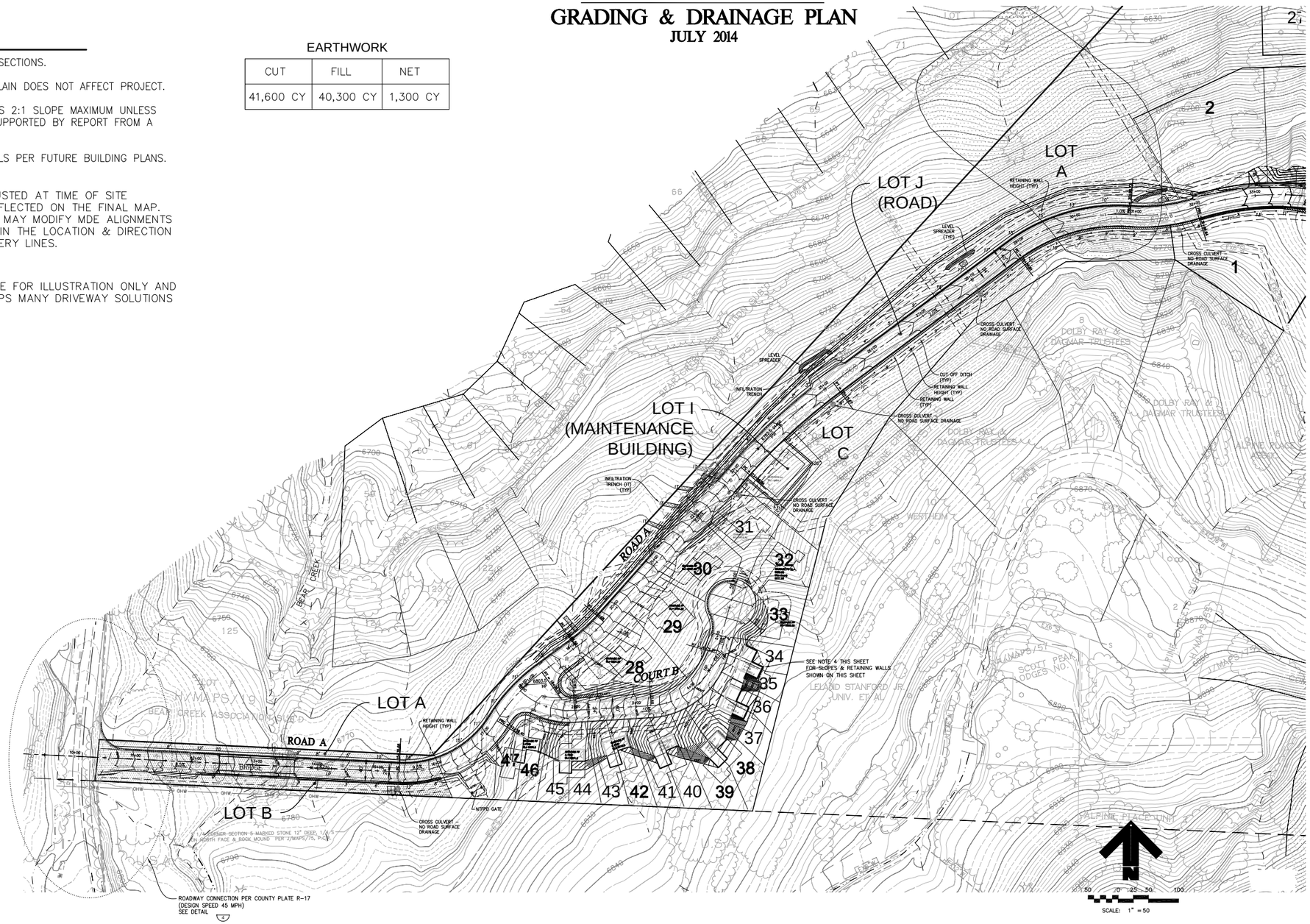
NOTES:

1. SEE SHEET 4 FOR ROAD SECTIONS.
2. FEMA 100 YEAR FLOOD PLAIN DOES NOT AFFECT PROJECT.
3. ALL PROPOSED GRADING IS 2:1 SLOPE MAXIMUM UNLESS OTHERWISE NOTED AND SUPPORTED BY REPORT FROM A GEOTECHNICAL ENGINEER.
4. SLOPES & RETAINING WALLS PER FUTURE BUILDING PLANS. (TYP)
5. ANY MDE MAY BE ADJUSTED AT TIME OF SITE IMPROVEMENTS AND REFLECTED ON THE FINAL MAP. INDIVIDUAL PROPERTIES MAY MODIFY MDE ALIGNMENTS PROVIDED THEY MAINTAIN THE LOCATION & DIRECTION OF FLOW AT THE PROPERY LINES.

* DRIVEWAYS INDICATED ARE FOR ILLUSTRATION ONLY AND REPRESENT ONE OF PERHAPS MANY DRIVEWAY SOLUTIONS FOR EACH LOT.

EARTHWORK

CUT	FILL	NET
41,600 CY	40,300 CY	1,300 CY



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SOURCE: TLA ENGINEERING & PLANNING 2014

FIGURE 11-2a

Alternative A Grading Plan Sheet 1

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ALPINE SIERRA SUBDIVISION

VESTING TENTATIVE MAP

PLACER COUNTY, CALIFORNIA

GRADING & DRAINAGE PLAN

JULY 2014

TYPICAL CUT DRIVEWAY DETAIL

N.T.S.

TYPICAL FILL DRIVEWAY DETAIL

N.T.S.

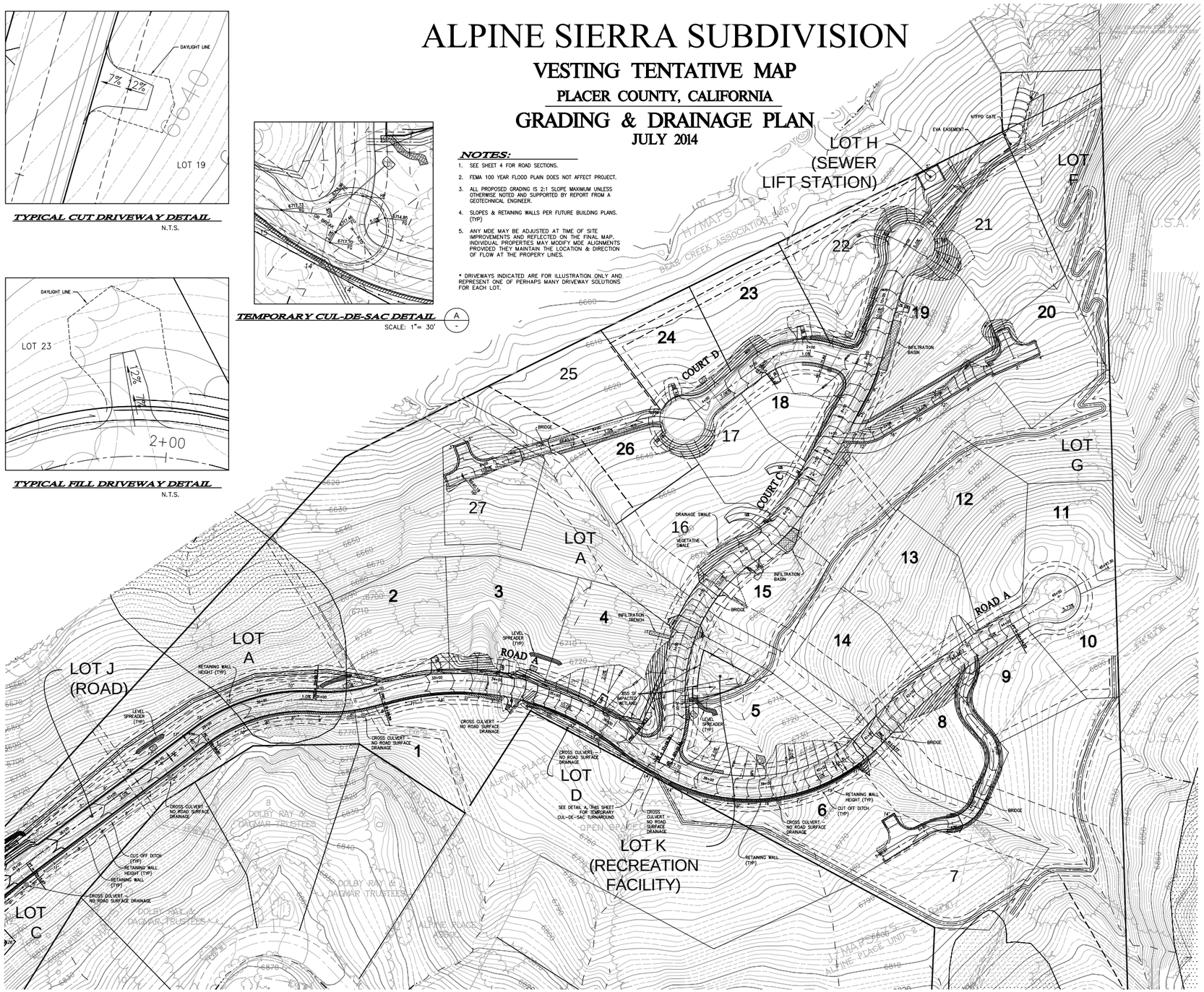
TEMPORARY CUL-DE-SAC DETAIL (A)

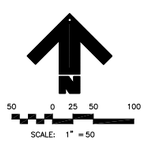
SCALE: 1"= 30'

NOTES:

1. SEE SHEET 4 FOR ROAD SECTIONS.
2. FEMA 100 YEAR FLOOD PLAIN DOES NOT AFFECT PROJECT.
3. ALL PROPOSED GRADING IS 2:1 SLOPE MAXIMUM UNLESS OTHERWISE NOTED AND SUPPORTED BY REPORT FROM A GEOTECHNICAL ENGINEER.
4. SLOPES & RETAINING WALLS PER FUTURE BUILDING PLANS. (TYP)
5. ANY MDE MAY BE ADJUSTED AT TIME OF SITE IMPROVEMENTS AND REFLECTED ON THE FINAL MAP. INDIVIDUAL PROPERTIES MAY MODIFY MDE ALIGNMENTS PROVIDED THEY MAINTAIN THE LOCATION & DIRECTION OF FLOW AT THE PROPERY LINES.

* DRIVEWAYS INDICATED ARE FOR ILLUSTRATION ONLY AND REPRESENT ONE OF PERHAPS MANY DRIVEWAY SOLUTIONS FOR EACH LOT.





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SOURCE: TLA ENGINEERING & PLANNING 2014

FIGURE 11-2b

Alternative A Grading Plan Sheet 2

Alpine Sierra Subdivision - Environmental Impact Report

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ALPINE SIERRA SUBDIVISION

OPTION 'B'

VESTING TENTATIVE MAP

PLACER COUNTY, CALIFORNIA

NOVEMBER 2016

GRADING & DRAINAGE PLAN

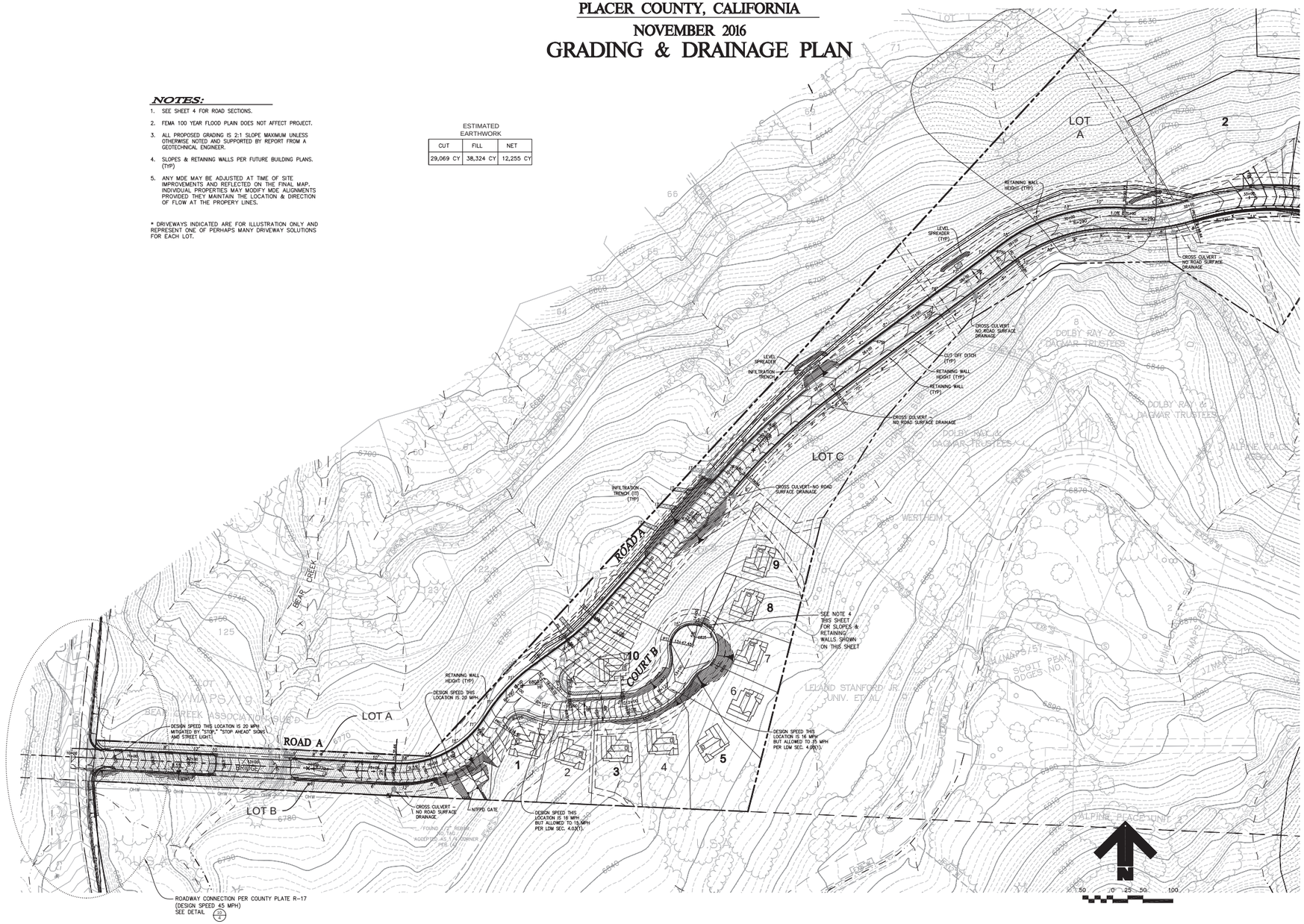
NOTES:

1. SEE SHEET 4 FOR ROAD SECTIONS.
2. FEMA 100 YEAR FLOOD PLAIN DOES NOT AFFECT PROJECT.
3. ALL PROPOSED GRADING IS 2:1 SLOPE MAXIMUM UNLESS OTHERWISE NOTED AND SUPPORTED BY REPORT FROM A GEOTECHNICAL ENGINEER.
4. SLOPES & RETAINING WALLS PER FUTURE BUILDING PLANS. (TYP)
5. ANY MDE MAY BE ADJUSTED AT TIME OF SITE IMPROVEMENTS AND REFLECTED ON THE FINAL MAP. INDIVIDUAL PROPERTIES MAY MODIFY MDE ALIGNMENTS PROVIDED THEY MAINTAIN THE LOCATION & DIRECTION OF FLOW AT THE PROPERY LINES.

* DRIVEWAYS INDICATED ARE FOR ILLUSTRATION ONLY AND REPRESENT ONE OF PERHAPS MANY DRIVEWAY SOLUTIONS FOR EACH LOT.

ESTIMATED EARTHWORK

CUT	FILL	NET
29,069 CY	38,324 CY	12,255 CY



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SOURCE: TLA ENGINEERING & PLANNING 2017

FIGURE 11-3a

Alternative B Grading Plan Sheet 1

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ALPINE SIERRA SUBDIVISION

OPTION 'B'

VESTING TENTATIVE MAP

PLACER COUNTY, CALIFORNIA

NOVEMBER 2016

GRADING & DRAINAGE PLAN

TYPICAL CUT DRIVEWAY

N.T.S.

TYPICAL FILL DRIVEWAY

N.T.S.

TEMPORARY CUL-DE-SAC

SCALE: 1"= 30'

A

NOTES:

1. SEE SHEET 4 FOR ROAD SECTIONS.
2. FEMA 100 YEAR FLOOD PLAIN DOES NOT AFFECT PROJECT.
3. ALL PROPOSED GRADING IS 2:1 SLOPE MAXIMUM UNLESS OTHERWISE NOTED AND SUPPORTED BY REPORT FROM A GEOTECHNICAL ENGINEER.
4. SLOPES & RETAINING WALLS PER FUTURE BUILDING PLANS. (TYP)
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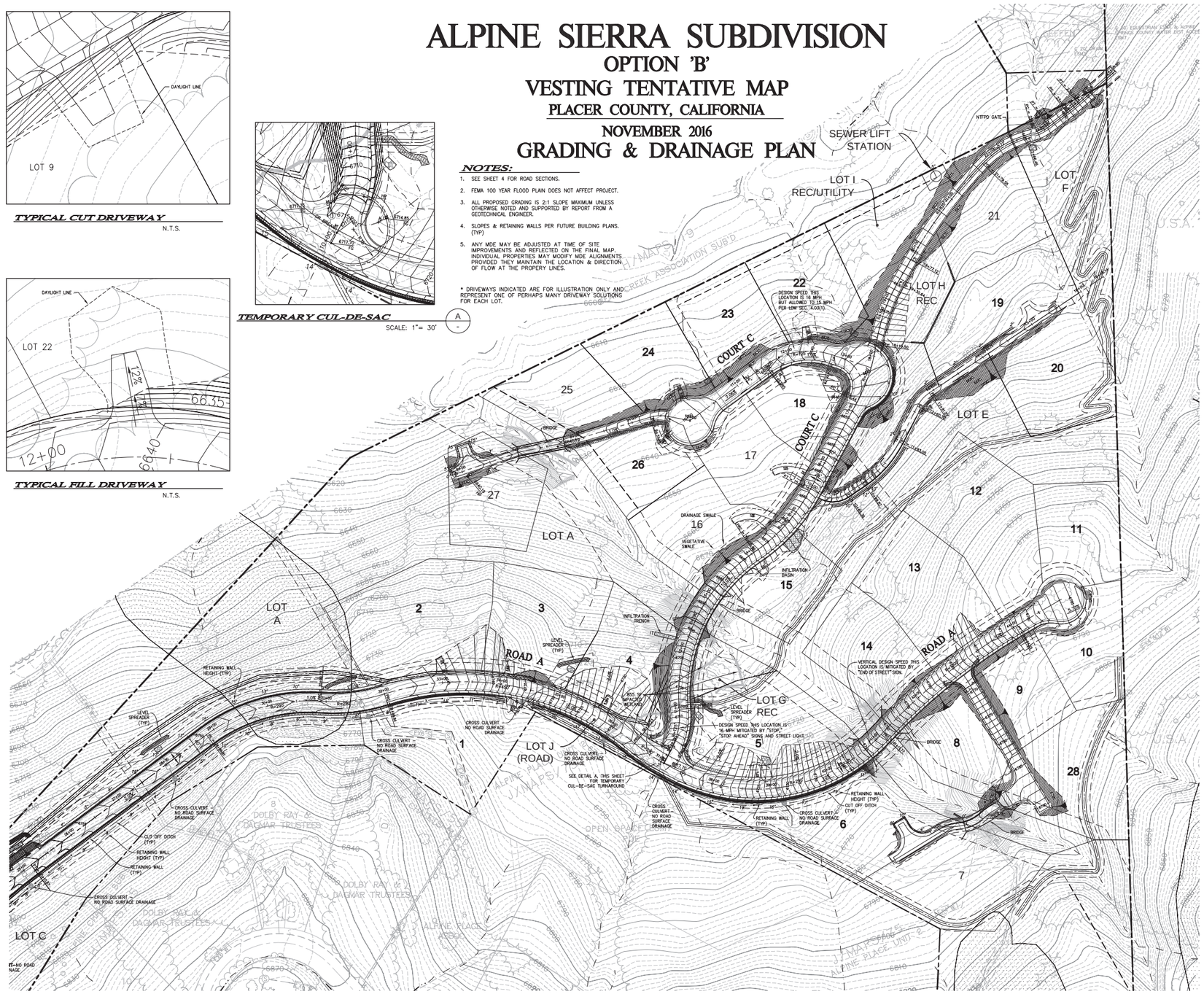

SOURCE: TLA ENGINEERING & PLANNING 2017

FIGURE 11-3b

Alternative B Grading Plan Sheet 2

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Alpine Sierra Subdivision - Environmental Impact Report

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