5. Appendices

5.1. Appendix A: Maps and Figures

Maps and figures can be found on ePlanning: https://eplanning.blm.gov/eplanning-ui/project/2030186/570

5.2. Appendix B: Issues Not Analyzed in Detail

5.2.1. Cultural Resources

How would the project affect cultural resources and Native American religious concerns?

5.2.1.1. Methods and Assumptions

To understand the types of cultural resources and Native American religious concerns that could be impacted by the Project, a Class I survey of existing information was conducted of BLM and OR SHPO OARRA databases as well as literature reviews. Cultural resources are evaluated for their eligibility for listing in the NRHP using the criteria for evaluation defined by the NHPA and guidance through the Nation Park Service Bulletin 15 to evaluate the significance of a resource (36 Code of Federal Regulations [CFR] Part 60.4). Pursuant to NHPA Section 106, the analysis of potential impacts to cultural resources is limited to historic properties, as defined by Section 106 of the NHPA and its implementing regulations, 36 CFR Part 800.

This section identifies and describes the cultural resources and Native American religious concerns that would be affected by the proposed Project. For the purposes of this evaluation, cultural resources are the physical, cultural remains of past human activities and events. They include archaeological and historic built environment resources (i.e., sites, structures, buildings, and artifacts), traditional cultural places (TCP), traditional cultural landscapes (TCL), and historic properties of religious and cultural significance to Indian Tribes (HPRCSIT), as well as other cultural indicators of past human events and activities.

5.2.1.2. Affected Environment

The cultural resources Area of Potential Effects (APE) consists of approximately 40,168 acres. The physical APE is comprised of the mine, processing ancillary facilities, access road and transmission line and encompasses approximately of 2,027 acres. The non-physical APE (visual, auditory and atmospheric effects) includes the physical APE plus a one-mile buffer for a total of approximately 37,869 acres (Appendix A, Figure 15.).

The APE is within mostly undeveloped rangeland characterized by rolling hills with small rock outcroppings along ridgelines in a semiarid shrub-steppe vegetation zone dominated by sagebrush communities (Appendix B, Section 5.2.4). The APE encompasses lands administered by the BLM and Bureau of Reclamation (BOR), as well as privately owned parcels. Table 32 shows the APE acreage by landowner.

Table 32. APE acreage by land ownership.

Area of Analysis	BLM	BOR	Private/ROW	Total
Physical APE	1,529.33	n/a	497.26	2,026.59
Non-Physical APE	24,166.82	1.41	13,700.58	37,868.81
TOTAL	**25,696.15**	**1.41**	**14,197.84**	**40,168.40**

A search of the records on the Oregon Archaeological Records Remote Access (OARRA) database, BLM records and literature (Class I survey) revealed ten prior cultural resources studies have been performed within the area of analysis, five of which overlap the physical disturbance footprint. Approximately 147 cultural resources have been identified in the APE. Parts of the physical APE were surveyed in 2014 and 2015 (Holschuh 2015; Smith et al. 2016) with six cultural resources identified. EM Strategies completed additional cultural resource surveys in the physical APE in 2017 (Felling 2019) and documented 43 additional cultural resources for a total of 48 cultural resources in the physical APE. The cultural resources consist of five of the previously recorded archaeological resources, nine new archaeological resources, 14 new built environment historic resources, and 20 new isolated finds. The Oregon State Historic Preservation Office (OR SHPO) has concurred with the eligibility recommendations for 44 of the 48 cultural resources discussed in Felling 2019. Conversely, the OR SHPO has not concurred on three of the cultural resources due to lack of complete information. Of the 48 cultural resources within the APE there are 22 that could potentially be adversely affected by the Project.

5.2.1.3. Environmental Consequences

5.2.1.3.1. No-Action Alternative

Under the No Action Alternative, Calico would still conduct notice level work on BLM lands limited to up to five acres of ground disturbance at one time where it has valid mining claims. Calico would be required to reclaim that land once the notice level work was completed. The facilities (the processing plant, mine support facilities, basalt quarry, transmission line, and access road upgrades) that Calico proposes to build on BLM administered lands would not be constructed and mining would not occur. Landscape conditions would remain the same resulting in no impacts to eligible or unevaluated cultural resources.

5.2.1.3.2. Proposed Action

Under the Proposed Action, the Project would have the potential to adversely impact ten historic and precontact cultural properties within the physical APE that are currently recommended as *eligible* or *unevaluated* for listing in the NRHP under Criterion D, data recovery potential. Additionally, one site that is recommended as *unevaluated* for listing in the NRHP would be adversely impacted by the construction of the transmission line. Thus, the Project as proposed would result in a*dverse physical effects* to approximately 11 cultural properties. Eleven additional resources would be adversely affected due to visual, auditory and/or atmospheric impacts. The BLM is consulting with OR SHPO and affected tribes, including the Burns Paiute Tribe and Shoshone Paiute Tribes of the Duck Valley Indian Reservation, to assess if avoidance

and/or minimization of the adverse effects is feasible, pursuant to 36 CFR Part 800.5. These measures could include a buffer zone around an identified resource or micro siting away from resources to avoid physical impacts.

Short term impacts to cultural resources would occur during the two years of mine construction including improving the proposed access road. During this time, impacts to cultural resources would be both physical and non-physical. Long term impacts would occur during the operations and decommissioning/reclamation of the mine site during years two through 14, or until vegetation has re-established, and would mostly be visual, auditory and atmospheric in nature. If the adverse effects cannot be avoided, the BLM would consult further with tribes, OR SHPO, and Advisory Council on Historic Preservation (ACHP) to resolve the adverse effects pursuant to 36 CFR Part 800.6. Resolution of adverse effects requires consultation and agreement on appropriate mitigation and can vary depending on the size, scope and type of cultural resource.

5.2.1.3.3. Conclusion

Because of Project Design Features and ongoing consultation with Tribes, OR SHPO and the ACHP regarding appropriate mitigation, there would be no irretrievable or irreplaceable impacts to cultural resources.

5.2.2. Lands with Wilderness Characteristics

There are no Lands with Wilderness characteristics within the planning area (Appendix A, Figure 16).

5.2.3. Noise

How would noise related to the construction, operation and closure of the Proposed Action affect the environment?

5.2.3.1. Analysis Method

The state of Oregon Department of Environmental Quality (ODEQ) has established statewide maximum permissible environmental noise levels for new industrial uses at the nearest noise-sensitive property (such as a residence, school, church, hospital, or public library). Stantec (2024) conducted a noise analysis focused on key noise receptor locations to assess compliance with ODEQ noise criteria. Two noise study areas were defined: Noise Study Area 1 encompassing Site D and Noise Study Area 2 encompassing Site B and Site C (Appendix A, Figure 17.).

The analysis assumed the primary sources of the Proposed Action noise would occur during construction and operations, to be considered short-term effects. Construction is planned to occur for two years followed by eight years of operations; therefore, short-term effects would occur for a total of ten years. Noise levels during the closure and reclamation phases were assumed to be lower than those during the construction and operations phases because during the four years of closure construction activities, some of the equipment and activities required would be similar in nature but lower in quantity, and for the 26 year post-closure monitoring period, activities at site

would not include heavy equipment or construction activities and be limited to infrequent, quarterly, site visits utilizing light vehicles for short durations (less than one month). As a result, a quantitative noise assessment for the closure and post-closure period was not conducted. The noise analysis considered noise emissions from mobile and stationary equipment during construction (two years) and operations (eight years) activities at the mine site and access road (Stantec 2024). These activities include traffic to and from the mine site as well as construction and operations at the mine site. Potential noise impacts on identified noise receptors were determined by comparing existing baseline noise levels with predicted noise levels. The noise impact analysis was conducted using the baseline noise measurements described above and noise modeling (Stantec 2024).

Maximum permissible environmental noise levels for new industrial facilities are measured at nearby quiet areas (such as wilderness areas, state parks, game reserves, wildlife breeding areas, and outdoor amphitheaters) and are more restrictive (lower) than for noise-sensitive properties. A noise effects model was prepared for the construction and operation phases using the Cadna/A software (DataKustik 2021), which incorporates International Organization for Standardization (ISO) Standard 9613 (ISO 1993, 1996) algorithms, which specify methods of calculating the attenuation of sound propagating outdoors. These ISO standards are commonly used by noise practitioners and are widely accepted by regulatory bodies and government agencies. The Cadna/A software model accounts for multiple factors including geometric spreading, atmospheric absorption, ground conditions, the size, location, directivity and elevation of noise sources, and mild downwind conditions from the Proposed Action to the dwelling(s) and/or temperature inversion condition (Stantec, 2024).

Proposed Action noise emissions were established using information sources including equipment lists, design data, and equipment noise ratings based on the data from similar equipment from the Stantec acoustic database; equipment specifications and referenced formula from acoustic literature; a publication that provides reference sound power levels and sound pressure levels for common construction equipment (Department for Environment, Food, and Rural Affairs 2005); and measurement data of the sound power levels and sound pressure levels for common operational equipment. During operations, traffic to and from the mine site would include light vehicles, employee shuttle buses, and delivery vehicles estimated to be in a low range of eight to 31 vehicles per day. The Transportation baseline report (EM Strategies, 2018) presents traffic count data collected at two locations, one of which was located on Twin Springs Road, the proposed access route, at approximately the midpoint between Russell Road and the intersection with Mithell Butte Road. Data were collected in the fall and spring for 30 days and recorded 18.8 vehicles per day for the fall period and less than 1 vehicle per day for the spring period. Additional traffic data were collected for the first quarter of 2025 at a different location on Twin Springs Road south of the intersection of Twin Springs Road and Mitchell Butte Road (SLR, 2025). These data recorded an average of five vehicles per day.

5.2.3.2. Affected Environment

The analysis area for the existing ambient noise includes the Plan of Operations boundary including the Mine and Process Area and the Access Road and Transmission Line and two study areas associated with receptors representing noise-sensitive properties (Appendix A, Figure 17.). Existing ambient noise levels were measured by Creative Acoustics Northwest, Inc. (2019) at four noise measurement sites described below and shown in Appendix A, Figure 17.:

- **Site A**: An undeveloped area on Bureau of Land Management (BLM) land located approximately 170 feet west of Twin Springs Road, approximately three miles south of the Cow Hollow Road and Twin Springs Road intersection. This measurement location, although not technically a noise-sensitive property, was intended to represent a location that could experience an environmental noise effect due to a change in road traffic accessing the mine along Twin Springs Road. Data at this location were collected for reference only.

- **Site B**: Located in the Lake Owyhee State Park, 1298 Lake Owyhee Dam Road, Adrian, Oregon, approximately 250 feet west of Fisherman Road (the access road into Indian Creek Campground) and approximately 600 feet south of the gate entrance into Indian Creek Campground. This measurement site was chosen to represent the closest noise-sensitive property to the mine site.

- **Site C**: A location situated within the Mine and Process Area, approximately 375 feet southwest of the proposed entrance gate and 150 feet west of an unnamed access road. This measurement location, while not technically classified as a noise-sensitive property, was intended to represent an undeveloped rural area. Data at this location were collected for reference only.

- **Site D**: A residence located at 2025 Bishop Road, Vale, Oregon, approximately 250 feet east of Russell Road. This measurement site was chosen to characterize a residential noise-sensitive property and to characterize a location that would potentially experience a change in road traffic along Russell Road. Additionally, three receptors have been identified in proximity, classified as residences.

At each location, for each 1-hour interval, ambient meteorological data including temperature, wind speed, wind direction, barometric pressure, precipitation, and humidity were recorded. The results of the ambient noise measurements indicated the primary noise sources were as follows:

- **Site A**: atmospheric (wind) movement, vegetation movement caused by the wind, occasional vehicular traffic, and bird activity (song and movement).

- **Site B**: atmospheric (wind) movement, vegetation movement caused by the wind, vehicular traffic, boating activity on the lake, occupied campground activity, and bird activity (song and movement). At night, an added contributor was insect activity around the lake, and although audible, was not excessive in loudness nor duration.

- **Site C**: atmospheric (wind) movement, vegetation movement caused by the wind, and bird activity (song and movement). There were no anthropogenic noise sources in the vicinity of Site C when the measurements were taken.

- **Site D**: atmospheric (wind) movement, vegetation movement caused by the wind, vehicular traffic along Russell Road and some along Bishop Road, and agricultural activity including irrigation pumping equipment and field implements.

Noise levels in the existing environment at these sites are low except when vehicles were driving by, and farm equipment was in use (Creative Acoustics Northwest, Inc. 2019).

5.2.3.3. Environmental Consequences

5.2.3.3.1. No-Action Alternative

Under the No Action Alternative, Calico would still conduct notice level work on BLM lands limited to up to five acres of ground disturbance at a time on its valid mining claims. Calico would be required to reclaim that land once the notice level work was completed. The facilities (the processing plant, mine support facilities, basalt quarry, transmission line, and access road upgrades) that Calico proposes to build on BLM administered lands would not be constructed and mining would not occur. Current uses of the project area would remain and there would be no changes to the current ambient noise levels.

5.2.3.3.2. Proposed Action

The ODEQ noise regulations only apply to noise-sensitive properties (Site D) and quiet areas (Site B). Stantec (2024) modeled noise at Site D, which has three residential dwellings near the proposed access road and approximately six miles from the mine site, and Site B, which is near Lake Owyhee State Park, six miles from the mine site. Stantec used the Federal Transit Authority (FTA) guidance on noise effects during construction and the modeling results were compared to the ODEQ noise criteria and FTA noise limits.

The construction phase was selected for modeling for noise impacts because it represents the worst-case scenario of equipment usage with the associated activities which include the use of heavy equipment within the mine site and along the access route, upgrades and realignment of the access road, upgrades of existing powerlines and installation of new powerline, blasting at the quarry and mine sites, construction of ancillary facilities (TSF, TWRSF, processing building, etc.) and the use of passenger vehicles driving to and from the mine site.

During construction of the powerline, one emergency diesel generator capable of producing 2,000 kW would be located at the process plant to be used during construction and initial mining of the underground mine decline. Noise impacts would be short term, approximately two years, or until the powerline is completed and energized to power the mine site.

The operational phase would include eight years of mining, milling, and processing. The mine site activities would include mobile equipment, such as haul trucks and other trucks traveling

between different areas on site, and stationary equipment in the process areas, mine area, and other operating areas. Stationary equipment would include equipment in the process building, reagent building, gold room, and mill building. No mine haul trucks or other heavy equipment es would travel along the access road during the operation phase, so operational vehicle noise for that area was not included in the modeling.

Aboveground mobile equipment would operate across the entire site. The noise emissions from the mobile equipment would be distributed throughout the site. Mobile sources such as haul trucks and hydraulic loaders operating aboveground across the mine area would operate for two twelve-hour shifts per day. The mine would operate 24 hours per day, four days per week, and processing would occur 24 hours per day, seven days per week. Mobile mining equipment that remains underground would have no noise effects on aboveground noise levels. Noise associated with daily operations would remain localized and would not impact noise-sensitive properties (site D) or quiet areas (site B).

Blasting would occur during construction of the mine and construction and continued use of the quarry site. Blasting would be most constant during the construction phase, two years, and at specified time during operations when excavating materials from the quarry. Because there is a specific time schedule for quarry blasting, impacts are less than one day.

Design features to minimize the effects of noise due to traffic include limiting speeds on the access route to 35 miles per hour and the use of shuttle buses for the transportation of employees to the mine site during the operations phase.

Beyond residential impacts, noise has the potential to affect Range Management, Section 3.6 and Wildlife, Section 3.12. Effects to those resources are presented those Sections respectively.

5.2.3.3.3. Conclusion

Short term, approximately two years, impacts from noise would occur during construction as road improvements, mine development and the construction of ancillary facilities occur. Moderate term impacts from noise, two to 14 years, during operations and closure of the mine would occur due to localized heavy equipment use, quarry development, ancillary facility use and deconstruction and the transport of workers and materials to and from the mine site. Long term effects from noise, longer than 14 years would not occur because after the mine has closed and the ancillary facilities have been removed, the only activities would be associated with reclamation/rehabilitation of the site and monitoring which would entail in frequent vehicle traffic along the access route and at the mine site utilizing pickup trucks and/or passenger vehicles. There would not be any irretrievable or irreplaceable impact to the site and surrounding area as a result of noise.

5.2.4. Recreation

How would the project affect recreation access?

5.2.4.1. Affected Environment

The recreation resources area of analysis consists of the entire Project area for the Proposed Action (the Mine and Process Area and the Project Access road and Transmission Line Area). Roadways used for recreation opportunities within the recreation area of analysis include Russell Road, Cow Hollow Road, and Twin Springs Road (Project Access Area; Appendix A, Figure 18.).

The area of analysis facilitates dispersed recreation and is served by an established road network that ensures recreational access. Available recreational opportunities include off-highway vehicle (OHV) usage, camping, hiking, hunting, wildlife observation, and rockhounding (EM Strategies 2018a). No designated recreation sites are located within the area of analysis.

The nearest designated recreation site is Twin Springs Campground, approximately three miles southwest of the Project area. The BLM manages the Twin Springs Campground, which is primitive and has limited amenities, including a vault toilet, non-potable water hand pump, picnic tables, and fire rings and is accessed via Twin Springs Road. The Oregon Department of Fish and Wildlife, Big Game Hunting Southeast Area - Owyhee Hunt Unit 67 comprises the area of analysis, where hunting for mule deer, elk, and pronghorn sheep is popular (ODFW 2025). Within the area of analysis, OHV use is limited to existing roads and primitive routes (BLM 2024).

There are no designated wild, scenic, or recreational rivers within the recreation area of analysis. The Owyhee River, located approximately 31 miles from the recreation area of analysis, is the closest nationally designated wild, scenic, or recreational river (EM Strategies 2018b).

5.2.4.2. Environmental Consequences

5.2.4.3. Analysis Method

The analysis relies on existing Project specific data and incorporation of best available science where necessary, such as BLM or State of Oregon publicly available data resources. Spatial indicators (acreages) are used to analyze the spatial extent of effects. Temporary effects are quantified analyzing the effects relative to the schedule of operation. Short-terms effects occur within the first two years of pre-operation construction through operation and decommissioning (14 years after initiating construction). Long-term effects occur starting the first year following the final year of decommission and analyzed for 26 years until final closure. The analysis area for characterizing recreation resources consists of the Mine and Process Area and the Project Access Area (approximately 1,655 acres), which encompasses where recreation resources may be present and affected, either by changes to short- or long-term deviations from the natural viewscape. The degree of effect on recreational areas and uses was determined by considering the portion of the analysis area that the project would affect compared to the total areas available for recreation.

The BLM's Recreation Opportunity Spectrum (ROS) characterizes recreation opportunities in terms of setting, activity, and experience opportunities. The ROS provides a way to characterize either the capability of a resource to provide an experience, or the demand for an experience in terms of the activity opportunity and setting opportunity provided or demanded. The ROS is divided into six classes, with each class defined in terms of its combination of activity setting and experience opportunities. The six classes are primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban. The two recreation classifications (BLM 2002) that occur within the area of analysis are summarized below:

- Semi-primitive motorized - This is a predominantly natural or natural-appearing environment of moderate to large size. User interaction is low, but there is evidence of other users. Minimum on-site controls and restrictions may be present. Use of motorized vehicles is permitted. There is a moderate probability of experiencing isolation, closeness to nature, and self-reliance in outdoor skills. Activities may include boating, motor biking, specialized landcraft use, mountain climbing, driving for pleasure, camping, and picnicking.

- Rural - This is a substantially modified environment. Resource modifications and utilization practices are to enhance specific recreation activities. Facilities are designed for use by a large number of people. Motorized use and parking opportunities are available. The probability of user interaction is moderate to high, as is the convenience of sites and opportunities. These factors are generally more important than the physical setting. Wildland challenges and testing of outdoor skills are generally unimportant. Activities may include interpretive services, swimming, bicycling, recreation cabin use, and skiing.

5.2.4.3.1. No Action Alternative

Under the No Action Alternative, Calico would still conduct notice level work on BLM lands limited to up to five acres of ground disturbance at a time on its valid mining claims. Calico would be required to reclaim that land once the notice level work was completed. The facilities (the processing plant, mine support facilities, basalt quarry, transmission line, and access road upgrades) that Calico proposes to build on BLM administered lands would not be constructed and mining would not occur. Existing recreational use and types of recreational activities in the general area would continue at existing levels and the notice-level work on BLM land would not be expected to affect existing recreational uses within the analysis area. Twin Springs Road, which leads to the Twin Springs Campground, would not be subject to upgrades, widening, or culvert installation, and current road conditions and use would continue.

5.2.4.3.2. Proposed Action

The Proposed Action will include the construction of 22,176 feet of temporary fencing for security and safety around the Mine and Process Plant Area boundary (perimeter fence) directly restricting recreation use by approximately 738.5 acres for approximately fourteen years. The total acreage temporarily affected is approximate 0.02 percent of the 4.6-million-acre planning area that encompasses public lands under the Southeastern Oregon Resource Management Plan Amendment (BLM 2002). Short term impacts, approximately two years during construction,

would be the increased occurrence of large construction type vehicles on the access road that might impede recreational traffic.

Short-term visual disturbance and noise during construction and operations would affect recreation users by reducing the amount of land available to users seeking primitive recreational experiences that are free from any signs of human alteration in the natural landscape. Specifically, fugitive dust emissions and facility placement within the proximity of common recreation areas may have direct short-term direct effects on recreational scenic values.

Additionally, a long-term effect resulting from the time necessary for vegetation to establish and mimic the conditions of the surrounding area may present a less-desirable landscape for scenic values, but this effect is temporary. Visual resources are further analyzed in Section 3.15 of the EIS. For recreational hunting, wildlife may avoid the Project boundary for greater than pre-existing distances due to the increase of traffic and noise resulting in further necessary travel to find hunting opportunities. Effects to wildlife are provided in Section 3.12 of this DEIS. As part of the Proposed Action, approximately seventeen miles of the Project Access Area, beginning at the intersection of U.S. Highway 20 (US 20) and Russell Road, south along Cow Hollow Road and Twin Springs Road, to the Mine and Process Plant Area, would be improved over an approximately one-year period. Roadway improvements would have a short-term, indirect effect on recreation activities due to delays for users of the Twin Springs Campground and Owyhee Reservoir, which would have greater effects in the summer season for recreational traffic. Long-term (20+ years) beneficial effects would be improved access for recreationists in winter months as a result of the Proposed Action's Road maintenance requirements.

Short-term effects would result from construction traffic, including oversized vehicles and trucks, that would travel along Twin Springs Road during the construction, operational, and decommissions stages of the projects (fourteen years) which may delay other road users. Traffic and delays would potentially cause short-term effects to recreationists and may encourage use of alternate routes to previously accessed areas. Signage would be installed along the roadways, alerting drivers of the presence of heavy construction vehicles to help prevent roadway conflicts. After roadway improvements are completed, the Project vehicle traffic, including pick-up trucks, service vehicles, mine staff personal vehicles, and a daily shuttle bus, would travel on Twin Springs Road for the life of the mine operations. This additional traffic is not anticipated to hinder recreational users, since Project vehicles would not be oversized and there would be more opportunity for mine related traffic to utilize the constructed pull-outs allowing for recreationists to bypass them.

Roadway improvements would have a direct beneficial short-term effect on recreationists from enhanced area access. Better road conditions would increase recreational visits, resulting in more traffic along these roadways as visitors find it easier to reach dispersed recreational opportunities. An increase in traffic would lead to indirect short-term effects to recreation users due to additional vehicle noise, fugitive dust, increased litter or dumping, and potential collisions with wildlife.

Under the Proposed Action, Mitchell Butte Road would be used as an emergency access route and does not require improvements. In the event of an emergency, traffic delays would have a

short-term effect on recreational users using Mitchell Butte Road when the road is used for an emergency-only event (Calico 2022).

Long-term effects are minimal, since the only activity occurring on site following decommission is reclamation monitoring. Reclamation monitoring will consist of scheduled mine site inspections (reclamation monitoring), groundwater monitoring, noxious weed treatments, over the 26-year monitoring period. In the final year of reclamation monitoring, the groundwater monitoring wells, growth media stockpile, and closure of the direct mine access road which spurs off the Twin Springs Road the site periodic travel will occur for the 26 years of reclamation monitoring to ensure that the affected landscape is returned to conditions that mimic the surrounding undisturbed landscape. Activities during the final year of closure (closure of monitoring wells, growth stockpile medium, and segment of access road) will likely have a similar effect to that analyzed in short term effects, as some earth-moving equipment and a water-well drill rig will be necessary to complete the reclamation objectives.

During the reclamation monitoring, it would be necessary to limit recreational activities in the area until hazardous materials are no longer detected within the mine site. Reclamation of surface disturbance would reduce visual disruption except for the quarry and the TSF, which would remain. The TSF would be capped and revegetated and ultimately take a form not contrasting significantly with the surrounding landscape.

The Mine and Process Plant Area does not offer unique recreational opportunities not found elsewhere in the vicinity, as there are other areas of public lands accessible for recreation within the MFO boundaries. The level of disruption to recreators considering both the short- and long-term effects would depend on their proximity to the construction and operation activities and would discontinue upon completion of the Proposed Action.

5.2.5. Vegetation and Wetlands

How would the alternatives affect vegetation, including Sensitive Species, wetlands, and invasive and noxious weeds?

This section identifies and describes the vegetation resources, including vegetation communities, wetlands, riparian buffer areas, invasive non-native species, noxious weeds, and special status plant species that would be affected by the Proposed Action and No-Action Alternative. The vegetation resource area of analysis includes the proposed boundary of the Plan of Operations (Mine and Process Area and the Access Road Area) (Appendix A, Figure 19.).

5.2.5.1. Affected Environment

5.2.5.2. Environmental Consequences

5.2.5.3. Analysis Method

The analysis in this section was completed by quantifying the acres of surface disturbance expected to result from the proposed project. Acres of impact were used to estimate the loss or degradation of upland vegetation communities, wetlands and riparian zones, and potential

impacts to special status species. The extent of ground disturbance was also used to quantitatively and qualitatively assess the increased risk of dispersal of noxious weeds and invasive species.

For the purposes of this analysis, short-term effects were considered to occur through pre-production construction (2 years) and 8 years of mining and processing. Long-term effects were defined as longer than 8 years and include the four-year-long closure period and the reclamation period which would last until monitoring indicated reclamation conditions were met.

5.2.5.3.1. No-Action Alternative

Under the No Action Alternative, Calico would still conduct notice level work on BLM lands limited to up to five acres of ground disturbance at a time on its valid mining claims. Calico would be required to reclaim that land once the notice level work was completed. The facilities (the processing plant, mine support facilities, basalt quarry, transmission line, and access road upgrades) that Calico proposes to build on BLM administered lands would not be constructed and mining would not occur. The analysis area would not be developed for mining purposes, with no associated changes in habitat or disturbance of upland, aquatic, or special-status species. Existing uses of the analysis area would likely continue, including cattle grazing on BLM-managed rangeland allotments. In summary, there would be minimal short-term effects to vegetation communities resulting from the impact of up to five acres of habitat, and no effects to wetlands from the No Action alternative.

5.2.5.3.2. Proposed Action

Under the Proposed Action, reasonably foreseeable environmental effects to vegetation resources include loss or degradation of upland vegetation, special status plants, and buffer/wetland vegetation communities and the potential to increase dispersal of noxious weeds. Short-term effects would extend through the active operation period of the mine. Potential impacts from these short-term uses (until closure begins) include temporary changes in existing vegetation communities, population decline of special status plant species, degradation of special status plant species habitat, and increased presence of invasive and noxious plant species in the analysis area. Long-term effects would occur during the closure and reclamation periods and would consist of a period of decreased vegetation community function and quality as the disturbed vegetation communities progress through the reclamation process. Long-term effects could consist of permanent changes to vegetation communities, such as a reduction in quality or quantity of native plant communities, potential introduction and spread of non-native and noxious plant species in previously healthy vegetative communities if the reclamation plan fails, and loss of individuals and habitat for special status plant species.

Under the Proposed Action, the development of the mine and processing facilities would cause surface disturbance to approximately 435.6 acres of BLM administered lands and 44.1 acres of privately owned land. Short-term affects to vegetation from construction of site facilities would include removal of vegetation and soil from surface layers for use in later reclamation activities. Long-term effects include potential changes in soil and vegetation composition and introduction of non-native species. Upon completion of surface disturbance, reclamation of the area would

take place to re-establish native vegetation in the area. Of the ten (plus wetland) vegetation communities three (plus wetland) community types are native communities, four are mixed native/non-native, and three are nonnative and/or highly disturbed.

Calico prepared a Reclamation Plan (Calico 2023) to be completed in accordance with the Bureau of Land Management (BLM), the State of Oregon Department of Geology and Mineral Industries (DOGAMI), and ODEQ regulations. The goals of reclamation are to establish a sustainable ecosystem similar to the conditions found prior to mining activities that supports defined land uses such as wildlife habitat and domestic grazing; minimizing erosion damage and protecting water resources through control of water runoff and stabilization of components; establishing post-reclamation surface soil conditions conducive to the regeneration of a stable plant community; and revegetating disturbed areas with a diverse mixture of plant species in order to establish productive long-term plant communities compatible with existing land uses. Depending on the seed mix used and re-establishment success of new vegetation, some existing non-native plant communities may be replaced with more desirable native vegetation, resulting in minor improvements over the long-term. Calico has also prepared a Noxious Weed Monitoring and Control Plan (Calico 2024) with the understanding that the risk of introducing or spreading weed infestations is high, and a management plan to prevent, treat, and monitor noxious weeds is required. Implementation of weed management techniques would be conducted in consultation with the Oregon Department of Agriculture (ODA), BLM, and/or the Malheur County Weed Inspector, as appropriate.

Mulford's milkvetch occurs in the analysis area along the access road. This sensitive species was detected at distances of 12 to 500 feet from the existing road. Due to the short distance from the road shoulder and the proposed widening of the access road individuals of this species could be directly affected by project-related ground disturbances and travel on roads adjacent to habitat for species. Individuals of its species are also documented beyond the anticipated disturbance and would not be impacted. Given that populations exist outside of the expected area of disturbance, this project would not trend this species toward federal threatened or endangered listing. Road upgrades and development of facilities as part of the proposed Project would necessitate either a permit or a consultation with staff at the ODA and the BLM.
In accordance with Executive Order 11990, the Project will avoid impacting ODFW Category 2 wetlands to the extent possible and will be required to show avoidance and minimization efforts.

The potential effects of the Proposed Action on wetlands would be classified as temporary and permanent. Permanent effects, depending upon the type, location and size would require mitigation measures to offset the permanent impacts to the resource. The contributing hydrology to the wetlands is seeps and a high-water table. A natural buffer zone of 50 feet has been established for state regulated wetlands, the permit registrant must establish and maintain any natural buffer. There would be short-term and long-term effects to the buffers. Short-term effects result from surface disturbances related to construction, operation and reclamation activities. Long-term effects consist of permanent changes to vegetation communities, irrespective of reclamation success.

Two state regulated wetlands were identified within the wetland analysis area. The two wetlands, totaling 0.20 acres, located in the Access Road Area (Appendix A, Figure 18.) could be disturbed

during road improvements, potentially resulting in permanent adverse effects. If any of these wetlands would be disturbed or filled to accommodate Project operations, a permit from ODSL would be required, and mitigation required to address effects to wetlands would be stipulated within the permit. All other wetland features found within the analysis area do not meet wetland criteria or are ephemeral in nature and effects are not expected.

The buffers could be disturbed by the road improvements. According to the ODEQ Natural Buffer Zone requirements, if the buffer is affected, erosion and sediment controls must be implemented to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer zone.

5.2.5.3.3. Vegetation Communities

The area of analysis is located in the Owyhee Uplands and Canyons subregion of the Northern Basin and Range Ecoregion and the Unwooded Alkaline Foothills subregion of the Snake River Plain Ecoregion. These ecoregions are known to be the driest ecoregions in Oregon, marked by extreme ranges of daily and seasonal temperatures. The landscape is defined as being composed of numerous flat basins separated by isolated mountain ranges. Vegetation in the region is characterized by sagebrush communities dominating the landscape with an understory of forbs and perennial bunchgrasses, such as bluebunch wheatgrass (*Pseudoroegneria spicata*) and Idaho fescue (*Festuca idahoensis*) (EM Strategies 2018). Distribution of vegetation types in the area of analysis is strongly influenced by variations in landscape position, soil type, moisture, elevation, and aspect. A large portion of the area has been affected by grazing, fire, and range seeding programs. Cheatgrass (*Bromus tectorum*) was one of the dominant species in every plant community (EM Strategies 2018). Vegetation community mapping took place in 2012, 2014, 2015, 2017, and 2019. As an outcome of the five survey events, ten plant communities (plus wetlands) were identified in analysis area, as described in Table 33.

Table 33. Identified Vegetation Communities in the Analysis Area

Confirmed Vegetation Community	Access Road and Transmission Line Area	Mine and Processing Area
Bluebunch Wheatgrass/ Cheatgrass/Annual-Perennial Community	69.0	49.5
Crested Wheatgrass Seeded Community	191.6	0.0
Big Sagebrush/Crested Wheatgrass Community	37.6	54.1
Yellow Rabbitbrush/ Bluebunch Wheatgrass Community	49.9	21.9
Big Sagebrush/Bluebunch Wheatgrass Community	145.4	398.1
Annual Weedy Grass-Forb Community	268.6	156.3
Big Sagebrush/Weedy Annual Grass-Forb Community	9.3	129.1
Mixed Annual Weedy Grass-Forb/Native Bunch Grass Community	42.0	47.2
Irrigated Pasture/Agricultural Crop Plant Community	12.0	0.0
Sagebrush / Bunchgrass x Annual Grass / Forb	0	28.0
Wetland *	0.1	0.0

*Source: Siskiyou BioSurvey LLC 2019 as cited in Stantec 2024, * Wetland Delineation Report EM Strategies 2018*

The Big Sagebrush/Bluebunch Wheatgrass Community is dominated by sparse to moderate cover of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), and a low to moderate cover of bluebunch wheatgrass. This community may also include other native bunch grass and forb species, including showy penstemon (*Penstemon speciosus*), Cusick's beardtongue (*P. cusickii*), death camas (*Toxicoscordion venenosum var. venenosum*), Sandberg bluegrass (*Poa secunda*), squirreltail (*Elymus elymoides*), Indian ricegrass (*Achnatherum hymenoides*), and needle and thread grass (*Hesperostipa comata subsp. comata*). A sub-type of this community found in the analysis area is Basin big sagebrush (*Artemisia tridentata* var.*tridentata*) with high native forb cover and lower bunchgrass cover (EM Strategies 2018). Mixed Annual Weedy Grass-Forb/Native Bunch Grass Community is represented by highly disturbed areas with weedy, non-native vegetation being dominant. Common grasses observed in this community include cheatgrass and Sandberg bluegrass. Common forbs include blue mustard (*Chorispora tenella*), western tansymustard (*Descurainia pinnata*), desert madwort (*Allysum desertorum*), and tall tumblemustard (*Sisymbrium altissimum*). This vegetation community was observed and mapped along the Access Road Area and in smaller patches in the Mine and Process Area (EM Strategies 2018).

The Crested Wheatgrass Seeded Community and Big Sagebrush/Crested Wheatgrass Community occur in both the Mine and Process Area and the Access Road and Transmission Line Area. This alliance represents a non-native vegetation type where non-native restoration seeding has been performed following disturbances. Crested wheatgrass (*Agropyron cristatum*) is dominant, with cheatgrass and Sandberg bluegrass very common and often with high total cover. Native grasses and forbs are uncommon and bare soil ranges from scattered to larger openings. Scattered areas of Wyoming sagebrush occur in the northern region of the Mine and Process Area and throughout the Access Road Area. Included in this mapped community is a sub-type where Wyoming big sagebrush drops out and yellow rabbitbrush (*Chrysothamus viscidiflorus*) co-occurs or dominates as a scattered to low shrub cover (EM Strategies 2018). The Big Sagebrush/Weedy Annual Grass-Forb Community is a disturbed native plant community type and occurs throughout the analysis area. Wyoming big sagebrush is the dominate shrub cover in this community with an understory dominated by non-native annuals. Cheatgrass is the dominate species within the herbaceous layer with common occurrences of tansymustard and clasping pepperweed (*Lepidium perfoliatum*).

The Bluebunch Wheatgrass/Cheatgrass/ Annual-Perennial Community is co-dominated by bluebunch wheatgrass and cheatgrass. Native vegetation is common in this community, including showy penstemon, Cusick's beardtongue, Hooker's onion (*Allium acuminatum*), death camas, Sandberg bluegrass, squirreltail, and needle and thread grass. Cheatgrass and medusahead grass being co-dominant with the bluebunch wheatgrass, and/or non-native forbs are more common. This vegetation community occurs throughout the analysis area.
The Yellow Rabbitbrush/Bluebunch Wheatgrass Community is dominated by a sparse to moderate cover of yellow rabbitbrush with bluebunch wheatgrass in the understory. Also included in this mapped association are areas where other native bunch grass species co-dominate with the bluebunch wheatgrass, including Sandberg bluegrass, squirreltail, needle and thread grass, and Indian ricegrass (EM Strategies 2018).

The Irrigated Pasture/Agricultural Crop Plant Community is primarily made up of non-native agriculture cultivated plant species with weedy species being common around the fence lines and along roads. Common weedy species include tansymustard, burningbush, tall tumblemustard, and field bindweed (*Convolvulus arvense*) (EM Strategies 2018). This community is found in the northernmost section of the analysis area.

The Sagebrush/Bunchgrass and Annual Grass/Forb Community is a mix of two of the previously described communities: Big Sagebrush/Bluebunch Wheatgrass Community and the Bluebunch Wheatgrass/Cheatgrass/ Annual-Perennial Community.

The Wetland Community is dominated by vegetation associated with wetland conditions.

5.2.5.3.4. Special Status Species

Data were accessed from the Oregon Biodiversity Information Center (ORBIC), BLM Geographic Biotic Observations (GeoBOB), and the U.S. Fish and Wildlife Service (USFWS) to identify known and potential occurrences of threatened, endangered, or sensitive species within the analysis area. No federally threatened or endangered plant species are known to occur within the analysis area. ORBIC and GeoBOB identified two plant species that were reported to occur within two miles of the analysis area: Cronquist's stickseed (*Hackelia cronquistii*) and Mulford's milkvetch (*Astragalus mulfordiae*) (EM Strategies 2018). Both species are designated as Oregon BLM sensitive plant species. Cronquist's stickseed is designated by the State of Oregon as threatened while Mulford's milkvetch is classified as endangered by the State. The *Final OR/WA State Director's Special Status Species List, August 3, 2021,* which lists Oregon/Washinton BLM Sensitive plant species suspected or documented to occur within the Vale District. was also reviewed for species with potential habitat in the proposed Project area.

Surveys for special status plants were conducted throughout the analysis area in 2012, 2014, 2015, 2017, and 2019. Mulford's milkvetch, a state listed and BLM sensitive species, was observed during the 2019 surveys at three locations along the access road portion of the analysis area and at one location adjacent to the analysis area (Appendix A, Figure 19.). This plant is limited to a region approximately 100 miles by 100 miles in shrub-steppe and desert shrub communities west of the Snake River Plain in eastern Oregon and adjacent southwest Idaho. It occurs from the Owyhee Uplands of Malheur County, Oregon, east to the Owyhee Front and to the Boise Foothills of Idaho (Stantec 2024). No other special status species were encountered during special status plant surveys or any other survey events.

5.2.5.3.5. Noxious Weeds

Non-native plants can include noxious weeds, which are defined as "a plant designated by a governmental agency to be injurious to public health, agriculture, recreation, wildlife, or property" (ODA 2023a). Baseline vegetation surveys were conducted in 2012, 2013, 2015, 2017, and 2019 (EM Strategies 2018; HDR 2014, HDR 2015; Siskiyou BioSurvey LLC 2019; Table 34). This information was supplemented with spatial information on invasive plant observations obtained from Oregon iMapInvasives (ORBIC 2023). Thirteen noxious species were observed throughout the analysis area during baseline vegetation surveys conducted between 2012 and

2019 (Table 34). Noxious weed species found to be most abundant in the analysis area included medusahead rye (*Taeniatherum caput-medusae*), Scotch thistle (*Onopordum acanthium*), and cheatgrass.

Table 34. Noxious weed species observed in the analysis area

Common Name	Scientific Name	Distribution	Malheur County Status	Oregon Status
Bull thistle	*Cirsium vulgare*	At Mine and Process Area	B	B
Canada thistle	*Cirsium arvense*	Along access roads and northern boundary of Mine and Process Area	B	B
Cheatgrass	*Bromus tectorum*	Dominant throughout	C	n/a
Common reed	*Phragmites australis*	One spot at small spring	B	B
Field bindweed	*Convolvulus arvensis*	Along access roads	C	B
Kochia	*Kochia scoparia*	Along access roads	C	B
Medusahead rye	*Taeniatherum caput-medusae*	Dominant throughout	B	B
Nodding/musk thistle	*Carduus nutans*	Along access roads	B	B
Ribbon grass/ reed canarygrass	*Phalaris arundinacea*	One spot at irrigation canal	A	B, T
Rush skeletonweed	*Chondrilla juncea*	Along access roads	A	B, T
Scotch thistle	*Onopordum acanthium*	Common throughout	B	B
Swainsonpea/ Austrian peaweed	*Sphaerophysa salsula*	Along access roads	B	B
Whitetop (hoary cress)	*Cardaria draba (Lepidium draba)*	Along access roads	B	B

Source: Calico 2024

Bull thistle is a Eurasian native widely established throughout every county in Oregon. It is a biennial, blooming July to September. It is considered a nuisance weed in pastures and rangeland as it forms dense thickets, which displace and outcompete more desirable forbs and grasses (ODA 2023b). Thistles tend to establish along roadsides, railways, ditches, and other highly disturbed sites and can be distributed via wind, water, birds, and other animals. It is also spiny, which makes it unpalatable to wildlife and livestock (USDA 2017a). Bull thistle can easily be controlled in pastures by using herbicides or by mowing to prevent seed production. Biocontrol insects (e.g., gall fly) are also effective at targeting seed dispersal, thereby reducing populations (ODA 2023b).

Canada thistle is classified as a creeping perennial native to southeastern Eurasia and Europe introduced to the United States mostly by imported grains. It is widespread throughout every county in Oregon. Canada thistle is commonly found in cultivated fields, riparian areas, pastures, rangeland, forests, lawns, gardens, roadsides, and waste areas (ODA 2023b). Seeds are winged and are easily dispersed by wind, water, birds, and other animals. Seeds can be spread over wide distances when it adheres to the surfaces and undercarriages of road vehicles and farm equipment (USDA 2017b).

Cheatgrass is an invasive plant the at common throughout the western and southwestern United States. The hairy, sharply awned seeds of cheatgrass are transported by various mechanisms including wind, water, birds, small rodents, etc. They adhere easily to clothing, fleece, and animal fur. The seed is often a contaminant in grain, hay, and straw. Seed carried on undercarriages of vehicles and road maintenance equipment is a major means of long-distance transport (USDA 2017c). Cheatgrass germinates early, and its roots grow rapidly during winter which allows uptake of greater soil moisture for rapid spring growth, early maturation, and increased drought tolerance. Its potential for high population densities and fine-textured fuels increases the likelihood for fire ignition and spread (USDA 2017c).

Common reed is native to Africa and temperate portions of Asia and Europe and spreads by dispersing seeds by wind, water, and animals. These transport methods can allow seed dispersal over long distances (ODA 2023b). It is found in limited distributions across Oregon. This species typically inhabits wetlands, estuaries, and areas with adequate moisture (ODA 2023b). Manual control methods such as mowing and chemical methods such as the use of herbicides for example glyphosate can be effective in managing this species (USDA 2005a).

Field bindweed is a deep-rooted herbaceous perennial widely distributed throughout Oregon. It is found in a wide range of habitats such as roadsides, stream banks, lake shores, ditches, and croplands, and is mildly toxic to grazing animals (USDA 2006). Complete eradication of field bindweed is difficult as seeds remain viable in the soil for up to 20 years (USDA 2006). Two biocontrol agents have been approved in Oregon, the defoliating moth and the gall mite (ODA 2023b).

Kochia is widely distributed in Oregon, especially in the eastern and dryer portions of the state. It was introduced as an ornamental species from Eurasia and became highly adaptable to a variety of habitats. It provides a significant challenge to right-of-way maintenance professionals because of its ability to rapidly develop resistance to many herbicides (ODA 2023b). This species can be toxic to livestock if consumed in large quantities (USDA 2010). No approved biological control agents are available at this time (ODA 2023b).

Having a wide distribution statewide, medusahead rye expands rapidly in fire scarred areas and low moisture rangeland (ODA 2023b). Medusahead rye out-competes other grasses by extracting the majority of moisture well before perennial grasses have begun to grow. Medusahead is rich in silica becoming unpalatable in late spring as livestock forage. Once the grass dominates an area, the land base becomes unable to support wildlife or livestock. No approved biological

control agents are currently available, although two seed attacking fungal smut diseases are being researched (ODA 2023b).

Musk thistle is a biennial thistle native to southern Europe and western Asia. It has a limited distribution in Oregon, mostly concentrated in Klamath County; however, other counties contain smaller populations that are targeted for eradication or containment. Musk thistle is unpalatable to wildlife and livestock hence selective grazing leads to severe degradation of native meadows and grasslands as grazers focus their foraging on native plants, giving musk thistle a competitive edge. It is also thought to produce chemicals that hinder the growth of other plants. Three control agents; a crown weevil, a seed head weevil and a flower fly, have been approved for release and have established in Oregon (ODA 2023b).

Ribbon grass, also referred to as reed canary grass, is often found in older gardens and abandoned farm sites. It grows well next to water and thrives in shallow water where it can be highly competitive. Ribbon grass is also tolerant of poor, dry soils and has virtually no disease or pest problems (ODA 2023b). Some manual and chemical methods can be used to control and manage ribbon grass, but no single method works everywhere (USDA 2005b).

Native to Eurasia, rush skeletonweed, was first documented in Oregon in 1974 in Douglas County. Now it is common in limited distributions throughout southwest Oregon counties. This deep-rooted species is able to draw water deep in the soil profile, enabling it to be very drought resistant. This species is an aggressive plant in both rangeland and cropland, particularly in lower elevation, light textured soils. Four biocontrol agents are approved for release. Three of these, a gall midge, a gall mite and a rust fungus, have been established in Oregon, but have only been effective in reducing seed production. A root-mining moth is established but the long-term effects have not been fully determined (ODA 2023b).

Scotch thistle is native to Asia and Europe and is now widely distributed throughout eastern Oregon. It invades rangeland by forming large dense patches that exclude all other vegetation. This is a biennial species that generally produces a rosette the first year. No approved biological control agent is available. Treatments for scotch thistle using mechanical and chemical methods are costly and must be repeated for years (ODA 2023b).

Swainsonpea was introduced from Asia and is common within Western states in irrigated fields and moist non-crop areas, such as along fences and roadsides. The seed of this species mimics the seed of alfalfa, making it difficult to separate them. Swainsonpea is also poisonous to livestock and wildlife due to alkaloids in the plant. There are currently no biological control agents available for this plant (ODA 2023b).

Whitetop is a perennial mustard native to southwest Asia. This species is widespread throughout southeastern Oregon. Whitetop favors unshaded, disturbed areas with moderately moist, alkaline soils (USDA 2017d). This species has an extensive root system and can form dense patches rapidly that outcompete other native species (ODA 2023b). Mechanical methods of removal, such as hand digging and grubbing, are used before the flowering and seeding. Flooding has been found to be effective if the area can be inundated for 2 months to diminish the seeds

viability. Herbicidal application can effectively control the spread of this species with repeated application (USDA 2017d).

5.2.5.3.6. Wetlands

In accordance with Executive Orders 11990 and 11514 (as amended) each agency shall review the project to ensure compliance with wetlands regulations. The analysis area for riparian zones and wetland areas is located in the lower Malheur and lower Owyhee subbasins of the middle Snake subregion. The area is composed of large rolling hills to open valleys with wetlands, seeps/springs, ponds, artificial waterways, and intermittent and ephemeral channels. The elevation of the analysis area ranges from approximately 2,300 to 3,800 feet above mean sea level and the slopes range from two to 15 percent. Appendix A, Figure 18., illustrates the natural buffer zone and wetland areas that occur in the analysis area.

According to the Oregon Department of Environmental Quality (ODEQ) Natural Buffer Zone (buffers) requirements for construction projects, there is a 50-foot buffer associated with state regulated wetlands. The Malheur County Code does not specify required buffers associated with wetlands.

Site alterations within the wetland analysis area include agricultural fields and heavy livestock grazing. Additional site alterations within the vicinity of the wetland analysis area include cut and fill roads used for vehicle access to various sites, and subsurface disturbance due to drill pads from past exploration activities, which occurred between 1986 and 2017.

The Regional Supplement to the Corps of Engineers Wetland Delineation Manual; Arid West Region methodology was used in the wetland field surveys (Environmental Laboratory 2008). Prior to conducting the fieldwork, a baseline desktop analysis was completed to identify the presence or potential presence of wetlands within the wetland analysis area. The following databases were reviewed:

- United States Geological Survey (USGS) topographic maps/aerial imagery
- Natural Resources Conservation Service (NRCS) soils database
- USFWS National Wetland Inventory (NWI) maps
- Oregon Statewide Wetland Inventory
- Oregon Department of State Lands (ODSL) Local Wetland Inventory (LWI)

Local Wetland Inventory mapping was not available for the wetland analysis area. National Wetland Inventory mapping indicated the presence of two emergent wetlands within or partially within the wetland analysis area. One of the two wetlands was confirmed to be within the wetland analysis area (Wetland 1). The second mapped emergent wetland did not meet the wetland criteria. There was an additional emergent wetland not mapped by the NWI, which met the wetland criteria (Wetland 2).

Wetland field surveys were conducted July 5, 2012, and April 7, 2015, and additionally in May 18 through 21, 2017. Two wetlands (Wetland 1 and Wetland 2) were identified within the

wetland analysis area. Wetland 1 and Wetland 2 are located within the Sagebrush Gulch drainage, which crosses a small portion of the wetland analysis area (EM Strategies 2018). Wetland 1 is mapped by the NWI as palustrine, emergent, persistent and saturated (PEM1B) and is approximately 0.16 acres within the wetland analysis area. The wetland extends approximately 0.09 acres outside the wetland analysis area. Wetland 1 consists primarily of cheatgrass and Great Basin wild rye (*Leymus cinereus*). Wetland soil was dark and consisted of sandy clay with small amounts of muck and redoximorphic features.

Wetland 2 is a 0.04-acre palustrine emergent (PEM) wetland occurring entirely within the wetland analysis area. This wetland is not mapped in the NWI mapping database. Wetland 2 consists primarily of Great Basin wild rye and bulbous bluegrass (*Poa bulbosa*). Wetland soil was dark and consisted of sandy clay with small amounts of muck and redoximorphic features. The hydrology associated with Wetlands 1and 2 appears to be from a small, unmapped spring complex and consists of a one-inch depth water surface. This area has a high-water table, which is within two inches of the surface.

There are ephemeral waterbodies in the area of analysis, including wetlands, springs, creeks, a pond, an artificial waterway, and tributary drainages. Based on the 2023 United States Supreme Court's Sackett decision, wetlands and streams not directly connected to traditional bodies of water are no longer considered Waters of the United States. Therefore, the U.S. Army Corps of Engineers has determined that these ephemeral waterbodies are not jurisdictional waters regulated by Section 404 of the Clean Water Act.

Wetland 1 and Wetland 2 do not have U.S. Army Corps of Engineers (USACE) jurisdictional status under Section 404 of the Clean Water Act since they lack a direct connection to a navigable water of the United States. ODSL typically requires a permit for placing of fill into or removal of fill from the "waters of the State" (WOS) (OAR 141-085-0520). The WOS that meet state regulated requirements within the wetland analysis area include Wetland 1 and Wetland 2 (Table 35).

Table 35. Wetland / Waterway observed in the analysis area

Wetlands/ Waterways	Cowardin[a]/ HGM[b] Classifications	Area (Acre)	USACE PJD[c]	ODSL PJD[d]
Wetland 1	PEM1B / Depressional	0.16	No	Yes
Wetland 2	PEM / Depressional	0.04	No	Yes

[a.] *Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979; FGDC 2013). PSS = palustrine scrub shrub; PEM1B = palustrine emergent, persistent, and saturated*
[b.] *Hydrogeomorphic (HGM) classification is based on A Hydrogeomorphic Classification for Wetlands (Brinson 1993).*
[c.] *Code of Federal Regulations (CFR) Title 33 Part 328.3, USACE. PJD = preliminary jurisdictional determination*
[d.] *OAR 141-085-0515.*

5.2.6. Wildfire Mitigation Plan

The Project boundary area is subject to federal and state permitting processes and is comprised of patented and unpatented lode and mill site claims, as well as a 25-mile access road. The U.S. Bureau of Land Management (BLM) Vale District Office administers the access road and

surface management. The BLM is the primary managing surface agency within and adjacent to the Project boundary, but other federal, state, and local land use authorizations and permits conditions may apply.

The purpose of the Wildfire Mitigation Plan (WMP) is to identify actions that Project environmental staff can take to mitigate the risk of wildfire to operations, use and occupancy, and the environment within the Project area. This includes access roads, pipelines, extractive equipment, water management systems, processing facilities and any other property within the operating area as identified in the Plan of Operations and the Consolidated Permit Application. The WMP does not require Calico to respond to fires within or outside the Project area, but it prescribes how Calico can mitigate wildland fire risk within the Project area. This includes supporting BLM efforts to both reduce fire shed risk and their response to active wildland fires on public lands. Some of Calico's actions to mitigate wildland fire risk go hand in hand with efforts to reduce infestations in the Noxious Weed Monitoring and Control Plan (Calico, 2024). Note that the terms fuels, vegetation, and weeds are used interchangeably throughout this WMP. A copy of this plan can be found on the ePlanning site and can be found here: https://eplanning.blm.gov/eplanning-ui/project/2030186/570.

5.3. Appendix C: Applicant Committed Environmental Protection Measures (Project Design Features)

Air Quality

1. Spraying water in high-traffic road areas to prevent fugitive dust from blowing offsite.

2. Implementing BMPs onsite for dust control, which may include water sprays, enclosures, hoods, curtains, shrouds, and movable and telescoping chutes.

3. Installing, operating, and maintaining emission units and associated control equipment in good working order to minimize emissions.
4. Evaluating air emission control requirements if the Project becomes a large- quantity generator per 40 CFR 265 Subparts AA (Air Emission Standards for Process Vents), BB (control air emissions from equipment leaks), and CC (control emissions from certain tanks, containers and surface impoundments).

5. Using biodiesel in underground mining equipment to reduce the buildup of emissions in enclosed spaces and reducing overall fuel emissions at the site with associated reduced effects to air quality and GHG.

6. Using SIC mine operations and scheduling, which can reduce transportation of materials, traffic waiting times, and emissions, with associated reduced effects to air quality and GHG.

7. Recycling rubber and plastic materials to save energy and reduce GHG emissions.

Cultural Resources

1. Conducting a tribal study of the area to address the SHPO's eligibility concerns for precontact cultural resources and assist in assessing effects and associated mitigation measures for these resources.

2. Implementing actions in the Inadvertent Discovery Plan in the event that historical or archaeological resources are found, including stopping work immediately in the vicinity of the find and notifying the SHPO and BLM archaeologist to protect cultural resources.

3. Placing a 30-meter buffer around any inadvertent discovery of cultural resources with work being able to proceed outside of this buffered area unless additional cultural materials are encountered to prevent damage to the discovery.

4. If human remains are encountered, securing the location, not disturb the remains in any way, not calling 911, and not taking photos. Work must not resume in the area of discovery until all parties involved agree upon a course of action.

5. Consultation is ongoing between the BLM and affected tribes to outline the process and procedures for mitigation for adverse effects to cultural resources. Such mitigation could include implementing a buffer zone around an identified resource for avoidance or conducting mining underneath these sites without impact, if possible. The outcome of this consultation will be discussed with the SHPO to determine the ultimate path forward.

Geology and Minerals

1. Constructing explosives-storage facilities at the southwest side of the Project area, using the hill as a natural barrier between the explosives-storage facility and other infrastructure.

Lands, Land Use, and Realty

1. Revegetating disturbed areas with appropriate plant species to establish self- sufficient, stable plant communities compatible with existing land uses.

2. Providing a stable post-closure landscape that supports defined land uses of livestock grazing or rangeland, wildlife habitat, and recreational land, with opportunities to consider mineral exploration and development when feasible.

Noise

1. Conducting noise disturbance activities outside of wildlife timing restrictions (e.g., avoiding noise-producing ground-disturbing activities such as road widening in mule deer winter -range habitat from December 1 to March 31). If this cannot be accomplished, coordinate with the ODFW for an exception.

2. Avoiding blasting for construction from March 1 to June 30 or coordinating with the ODFW in advance to determine appropriate measures to reduce or avoid impacts if blasting occurs during this period.

3. Conducting noise monitoring per the Noise Monitoring Plan, which provides the framework to monitor noise during construction, operation, and blasting.

4. Conducting noise monitoring and if construction-related noise exceeds expected levels from March 1 to June 30, halting activities and coordinating with the ODFW to determine an adaptive management approach.

5. Conducting blasting for operations only during daylight hours and avoiding periods from sunrise to 2 hours after sunrise and 2 hours before sunset.

6. Incorporating reduction components for machinery in coordination with the ODFW if noise levels are found above expected levels during operations.

7. Conducting confirmation noise monitoring following the implementation of mitigation measures imposed by the ODFW.

Non-native and Invasive Plants

1. Treating weed infestations prior to and after conducting any blading or other road maintenance activities.

2. Treatment may include herbicide application (e.g., roadside spraying) or mechanical removal.

3. Clearing topsoil contaminated with noxious weeds first and encapsulating it in the TSF in areas that are to be cleared and where noxious weeds have been identified to prevent their spread.
4. Disposing of noxious weeds and topsoil contaminated with noxious weeds appropriately to prevent their spread.

5. Using certified weed-free straw bales for sediment control and seed and mulch used in reclamation.

6. Conducting interim seeding for sites with exposed soil for more than one growing season to prevent the establishment of non-native and invasive plants.

7. Ensuring that personnel and contractors avoid, as much as possible, travel through areas that are identified as containing noxious weeds to prevent their spread to uncontaminated areas.

8. Power-washing vehicles and equipment used by personnel or contractors who transport equipment onsite or those who must travel through identified noxious weed areas to minimize the spread of noxious weed seeds. The main areas on vehicles to be decontaminated include the equipment tracks, tires, undercarriage, axles, wheel wells, running boards, bumpers, and brush guard assemblies.

9. Conducting fire management and prevention programs and post-fire reclamation efforts to mitigate against the effects of fire, which can change vegetation communities, allowing non-native and invasive plants to thrive.

10. Conducting monitoring to identify new weed infestations and to evaluate the effectiveness of noxious weed treatments.

11. Conducting post-closure noxious weed monitoring and control for a minimum period of 5 years following the cessation of mine operations.

12. Creating and following a post-closure monitoring plan coordinated with, and approved by, the BLM, DOGAMI and ODFW which would conclude at acceptance of mine closure.

13. Following an approved Restoration Plan that addresses restoring the site to a self-sustaining ecosystem (per OAR 635-420-0110).

Rangeland Management

1. Installing a perimeter fence around the Mine and Process Area to prevent access by livestock.

2. Installing gates or cattle guards along roadways where necessary to prevent livestock access to the site.

3. Replacing natural spring discharges in the event that groundwater drawdown reduces flow, which may include installing a well, constructing a system to capture and retain stormwater, or transporting water from another location.

4. Providing a stable post-closure landscape that supports defined land uses of livestock grazing or rangeland, wildlife habitat, and recreational land.

5. Supplementing spring flows with groundwater pumped from a new groundwater well installed near the spring or piping groundwater from a nearby existing well in the event of an observed reduction in flow at a livestock watering location.

6. Installing signage to restrict speed along the Access Road Area to reduce vehicular-livestock collisions.

7. Installing fencing along the Access Road Area in collaboration with the BLM to prevent livestock access to the road in some areas.

Recreation

1. Providing a stable post-closure landscape that supports defined land uses of livestock grazing or rangeland, wildlife habitat, and recreational land, and ensures a self-sustaining ecosystem.

Soils

1. Non-vegetative stabilization of disturbed areas within 14 days of earthwork activities stopping, and vegetative stabilization when conditions allow seed-mix to be distributed to minimize soil erosion by wind and stormwater.

2. Using temporary covers to minimize erosion of stockpiles from stormwater and wind.

3. Gravel surfacing on travel ways to minimize soil movement.

4. Installing runoff detention facilities and vegetated filter strips (e.g., bioswales) to minimize soil erosion by water. Runoff control structures include silt traps and fences constructed of certified weed-free straw bales or geotextile fabric and sediment retention basins. Soil collected in these structures will be periodically removed and placed in growth medium stockpiles for future use during reclamation.

5. Restricting vehicle to areas where vegetative stabilization or infiltration will be practiced to minimize soil compaction.

6. During reclamation, seeding growth media remaining in stockpiles for one or more seasons and use of erosion berms or swaddles around growth media stockpiles to reduce erosion.

7. Storing diesel fuel and hydrocarbon products in primary (e.g., tanks, tote bins, barrels) and secondary containment to prevent release into the environment.

8. Using seed growth media stockpiles that would be left for more than 1 month to prevent soil loss through wind erosion.

9. Installing stormwater controls to manage stormwater run-on.

10. Collecting soil samples from the bottom of the excavation after soil cleanup in the event of a spill, analyzing these samples for total petroleum hydrocarbons, and comparing the results to applicable standards to determine whether the excavation effectively collected all soil affected by the spill.

Vegetation and Wetlands

1. Minimizing disturbance to existing vegetation during construction and operation.

2. Creating selective site sterilization (i.e., vegetation-free spaces around fire hazard areas) to prevent wildfires.

3. Preparing any disturbed ground and sowing with an appropriate native seed mix to ensure successful growth and prevention of the spread of non-native and noxious weeds.
4. Establishing post-closure surface soil conditions conducive to the regeneration of a stable plant community during reclamation activities.

5. Revegetating disturbed areas with appropriate plant species to establish self-sufficient, stable plant communities compatible with existing land uses.

6. Conducting a new wetland delineation to attempt to identify the NWI-mapped and non-NWI-mapped wetlands and waterbodies and the Oregon DSL Statewide Wetlands Inventory-mapped wetlands and waterways in the study area as the extent, condition, and

function of these resources can change over time, so that adequate avoidance and mitigation measures can be identified for all resources.

7. Conducting a new wetland delineation during the growing season (March through August) to capture herbaceous plants and observing an accurate representation of the water table. Submit the wetland delineation to DSL for review and develop appropriate mitigation as needed for any identified wetlands that are located within Project disturbance areas.

8. Placing soil and amendments as necessary on reclaimed areas, and planting sagebrush plugs/seedlings, perennial grasses, and perennial forbs in appropriate quantities/ratios to achieve viable sagebrush habitats post-mining.

9. Developing a Sagebrush Habitat Monitoring Plan with ODFW oversight that incorporates adaptive management measures to address sagebrush plug failures, prevention of invasive grasses, alternate strategies for restoration, and extension of post-closure monitoring to a period of 20 to 30 years to confirm re-establishment of sagebrush communities.

Visual Resources

1. Avoiding the use of skyward lighting except where needed to maintain safe conditions (e.g., signal lights or lights on moving equipment).

2. Shielding stationary external lights and using motion detectors, timers, or dimmers where appropriate.

3. Directing lighting only onto work areas and away from adjacent areas not in use, with safety and proper lighting of the active work areas being the primary goal.

4. Following BMPs developed by the BLM for lighting at night, which includes minimizing the use of skyward lighting (unless needed to maintain safe conditions), installing motion detectors or timers and hoods/shields to avoid and minimize skyward lighting on exterior lights (to the extent practical), and directing all lighting only onto the active work areas.

Water Resources

1. No direct discharges to surface waters.

2. Using dual liners and leak detection for the TSF and TWRSF.

3. Collecting leachate formed from rainfall interaction with waste rock in the TWRSF in an underdrain system that drains to the reclaim pond.

4. Using secondary containment for process equipment, pipelines, and the TSF.

5. Installing stormwater control ditches, grading, berms, or curbing to divert stormwater away from Project facilities.

6. Installing straw wattles, silt fences, rock check dams, or ditching around construction areas to control erosion and avoid contamination of discharged stormwater.

7. Collecting and reusing surface water or groundwater exposed to excavated materials or mining process facilities, including collecting and diverting precipitation that falls directly onto Project facilities.

8. Monitoring of groundwater levels using two groundwater monitoring wells screened in the same Grassy Mountain Formation as the production wells to detect changes from baseline conditions and determine if mitigation is necessary.

9. Monitoring of spring, seep, and groundwater quality in the vicinity of select springs.
10. Replacing natural spring discharges in the event that groundwater drawdown reduces flow, which may include installing a well, constructing a system to capture and retain stormwater, or transporting water from another location.

11. Locating chemicals and other pollution sources away from surface water drainages and locating construction products and wash water in zero- discharge areas.

12. Managing all wash water in containment facilities and discharging into closed-loop septic system to prevent wash water from contacting the surface water.

13. Using concrete trucks to wash out in designated plastic-lined collection pits to avoid alkaline runoff.

14. Storing chemical and hazardous substances in vessels that prevent leaks and spills within secondary containment facilities.

15. Using drip plans or absorbents to collect any leaking fluids from equipment during equipment maintenance and fueling.

16. Installing a centralized oil-water separator adjacent to the truck workshop to treat water from drains located at each maintenance bay and from the wash rack to prevent impacts to surface and groundwater from truck maintenance and cleaning.

17. Storing oil that is separated in a double-lined tank or a single-wall tank in a concrete containment and collection by a licensed waste collection contractor
18. Conducting monitoring of groundwater levels and quality.

19. Supplementing spring flows with groundwater pumped from a new or existing groundwater well installed near the spring in the event of an observed reduction in flow at a spring location.

20. Transporting water from an alternative potable water source to provide water at the location of the affected spring or seep until alternative mitigation measures are operating.

Wildlife and Special-Status Species

1. Designing transmission lines to adhere to the Avian Power Line Interaction Committee suggested practices for avian protection and the Idaho Power Zone 3 standard for avian protection from electrocution.

2. Designing transmission lines to include perching and nesting deterrence structures located within 10 km of greater sage-grouse habitat and inspecting deterrence structures at least once every 3 years to identify needed repairs. If a nest is detected, coordinate with ODFW within one business day to determine an appropriate response.

3. Installing covers, mesh, or netting on potential nesting or roosting structures,such as open pipes or vents, to exclude birds and bats.

4. Avoiding ground-disturbing activities (i.e., construction) within low-density habitat for greater sage-grouse from March 1 to June 30 and avoiding road construction and widening in mule deer winter range from December 1 to March31. If an episodic activity needs to occur within the seasonal restriction, coordinate with the ODFW to determine the appropriate course of action (e.g., pre-activity nesting surveys to determine current occupancy prior to completing the activity, activity timing adjustments, a need for additional mitigation).

5. Using existing roads to the maximum extent possible during construction and operation; when this is unavoidable, using the minimum width for safe travel to reduce impacts to wildlife habitats.

6. Performing a nesting clearance survey 14 days prior to disturbance if vegetation clearing must occur during the migratory bird nesting period (April 15 to July 31). If an active nest is found, apply a 100-foot no-disturbance buffer until the nest has fledged or failed.

7. Conducting episodic Project-related disturbances (e.g., vegetation clearing, road improvements, facility construction) outside of timing restrictions specific to different species such as specific nesting seasons to avoid effects to wildlife during sensitive life stages. If these activities cannot occur outside the timing restriction, coordinate with the ODFW (and USFWS if golden eagles are involved) on a new course of action (e.g., pre-activity nest surveys).

8. Covering or filling trenches or install a wildlife ramp overnight to prevent animals from entering or being trapped in trenches.

9. Conducting concurrent reclamation during initial construction to mitigate habitat loss.

10. Installing fencing around the perimeter of the Project area to exclude wildlife and conducting monthly inspections of the perimeter fence to detect damage to the fence or evidence of under-burrowing by larger species and making repairs.

11. Installing exclusion methods for birds and bats in open pipes or vents such as covers, mesh, or netting to prevent their use as nesting structures. Monitor potential nesting structures during the nesting season to detect any failure of exclusion apparatus.

12. Avoiding the use of skyward lighting except where needed to maintain safe conditions (e.g., signal lights or lights on moving equipment) to avoid night lighting effects to bats and other nocturnal animals.

13. Disposing of garbage appropriately in covered waste bins to prevent access by corvids and other wildlife.

14. Conducting employee training to practice vigilance during periods of heightened wildlife activity (i.e., dawn and dusk), to report injured or dead wildlife onsite, and to perform appropriate trash control practices.

15. Requiring a 35-mph speed limit on the upgraded Access Road Area and bussing employees to the mine to reduce the risk of wildlife–vehicle collisions.

16. Managing WAD cyanide concentrations in the liquid fraction of the slurry going to the TSF so that it remains at the lowest concentration possible and does not exceed 30 mg/L in accordance with OAR guidelines, with a target concentration of less than 15 mg/L.

17. Conducting regular testing and sampling of the TSF and reclaim pond to demonstrate consistent non-toxicity to wildlife.

18. Installing physical exclusion devices, wastewater treatment methods, and regular monitoring to prevent wildlife from accessing the TSF and reclaim pond. Fence the TSF reclaim pond separately as an additional exclusion method.

19. Deploying bird deterrent balls on the TSF reclaim pond surface to deter birds and bats from access.

20. Following the ICMC guidelines for safe management of cyanide and cyanidation mill leach solutions and tailings.

21. Storing cyanide in a cyanide storage area completely fenced and secured, with a concrete slab and bund walls providing 110% containment.

22. Implementing the Noxious Weed Plan and Reclamation and Closure Plan to prevent habitat loss through a change in vegetation structure from pre-mine conditions.

23. Coordinating with agencies to implement and monitor reclamation using quantitative measures for evaluating habitat diversity, wildlife species diversity, and plant community composition, structure, and utilization by wildlife.

24. Conducting ongoing noise monitoring to ensure that noise is kept to expected levels.

25. Installing speed limit signage along the access road to restrict vehicular speed to reduce wildlife-vehicle collisions.

26. Installing deer crossing signage along the access road within the mule deer winter-range habitat to alert drivers of the potential for deer to cross the road.

27. Incorporating additional measures to prevent waterbirds from landing on the TSF pond and wildlife from entering the TSF area. Examples include using visual deterrents, motion-activated devices, laser deterrents, emergency hazing techniques, bio-exclusion zones, decoy ponds, hypersalinity, and/or netting and wires. The use of motion-activated devices is preferred as many visual and acoustic deterrents are deployed indiscriminately and not in response to specific bird activity, which leads to birds becoming habituated to these deterrents.

28. Conducting raptor nest surveys during the nesting season to determine if they are active and submitting findings to the USFWS and the ODFW, which could then impose avoidance buffers and determine if other protection measures are required, such as timing restrictions during the breeding and rearing season.

29. Performing construction activities and removing shrubs and grasses used for nesting outside of the nesting season to prevent birds from nesting in the area.

30. Following practices in BLM Technical Note 457, Night Sky and Dark Environments: Best Management Practices for Artificial Light at Night on BLM- Managed Lands to reduce glow effects.

31. Installing lighting only where necessary for safety and operational reasons, using dynamic lighting that turns on via motion sensors where practical, and installing light shields to direct light away from the sky and toward the area of focus to reduce effects of light pollution to bats and birds.

32. Installing reflective strips around the TSF perimeter on poles above the fence line to assist in deterring flying bats and birds from entering the area.

33. Installing markers on perimeter fences to make them more visible to greater sage-grouse in flight to reduce collisions and resulting injuries.

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34. https://eplanning.blm.gov/public_projects/2030186/200610863/20138569/251038549/Wildfire%20Mitigation%20Plan%202024-02.pdf

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