

MINING AND RECLAMATION PLAN

BLUE RIDGE ROCK QUARRY

Hopland, Mendocino County, California

#U 10-95

Prepared by:



100 North Pine Street
Ukiah, CA 95482

Job No. 15-218

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Amended July 6, 2017

Prepared for:



2301 Napa-Vallejo Highway
P.O. Box 2540
Napa, CA 94558

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PROJECT CONTACT INFORMATION

Applicant:	Syar Industries, Inc. 2301 Napa-Vallejo Highway PO Box 2540 Napa, CA 94558 (707) 252-8711
Property Owner:	McCutchan James F Jr. & Gloria J Trustees P.O. Box 538 Cloverdale, CA 95425 (707) 894-5429
Operator:	Syar Industries, Inc. 2301 Napa-Vallejo Highway PO Box 2540 Napa, CA 94558 (707) 252-8711
Agent of Process:	Jennifer Gomez, Permit Manager Syar Industries, Inc. 2301 Napa-Vallejo Highway PO Box 2540 Napa, CA 94558 (707) 252-8711
Lead Agency:	Mendocino County Department of Planning & Building Services 860 North Bush Street Ukiah, CA 95482 (707) 463-4281
Name of Mineral Property:	Blue Ridge Rock Products CA Mine ID # 91-23-0039
Owner of Mineral Rights:	McCutchan James F Jr. & Gloria J Trustees P.O. Box 538 Cloverdale, CA 95425
Site Address:	24951 Geysers Road Hopland, CA 95449
Location:	Latitude: 38.861937°N Longitude: 123.014588°W SE1/4 of Section 25, N1/2 and SW1/4 of Section 30 T12N, R10W, MDB&M

PROJECT SUMMARY

Operational Activities	
Mining	Excavation using loaders, dozers; blasting
Processing	Crushers, screens, conveyors
Reclamation	Extract and place overburden to achieve slopes in conformance with grading plan (Sheet MRP-10, Appendix B); place 6–24 inches of soil on reclaimed areas. Revegetate with grassland and oak woodland in conformance with Section 5 of the Mining and Reclamation Plan (MRP) and Sheets MRP 9-12.
Mine and Reclamation Data	
Parcels in Ownership	1,626± acres
Parcels affected by Project (within Mine Boundary)	050-350-23,-24; 050-410-40,-41; 050-450-26; 050-460-05,-06,-07,-09,-11,-20
Project Site	90.7 acres
New Area to be Disturbed	15.5 acres
Area to be Reclaimed	37.54 acres
Area not being Reclaimed	20.77 acres (ranch roads and facilities; exposed rock slopes)
Depth of Mining	1250 ft above MSL (30 ft below current lowest point)
Maximum Volumes	
Annual Extraction	200,000 CY (446,000 tons) includes 10% overburden
Cumulative Extraction	6,000,000 CY over 30 years
Daily Extraction	1,116 CY
Annual Recycle Import	40,000 CY (40,000 tons)(1 ton/CY)
Annual Soil Import	10,000 CY (13,000 tons)
Hourly Processing	325 tons
Daily Processing	2,600 tons
Annual Plant Throughput	307,600 tons (267,600 tons virgin* + 40,000 tons recycled) *Large rock is not fed through the processing equipment
Annual Production	441,400 (401,400 tons virgin; 40,000 tons recycled)
Operations Schedule Period	
Hours of Operation	Mon – Sat, 7:00 am to 6:00 pm; 45 nights
Length of Use Permit	30 years
Initiation Date	June 2018
Termination Date	June 2048
Monitoring Complete	2053
Reclamation	
End Use	Open space

AGENCIES AND PERMITS

County of Mendocino Department of Planning & Building Services (PBS)

The County of Mendocino Department of Planning & Building Services is the Lead Agency for the Project pursuant to CEQA. As the Lead Agency, the County is responsible for preparation of the environmental document (Mitigated Negative Declaration or Environmental Impact Report), adopting or certifying the environmental document, approving the *Mining and Reclamation Plan*, and issuing a new Conditional Use Permit.

The following agencies may be Responsible Agencies under CEQA, or may need to issue a permit for the Project.

County of Mendocino Public Health Department – Environmental Health Division (DEH)

If a Hazardous Materials Business Plan (HMBP) is required, the County Division of Environmental Health (DEH) will require a Certified Unified Program Agency (CUPA) permit. The HMBP must be kept current and uploaded to the California Environmental Reporting System (CERS) website for access by first responders.

County of Mendocino Department of Transportation (DOT)

Improvements to the haul road approach at Geysers Road would require an encroachment permit from the County Department of Transportation.

Mendocino County Air Quality Management District (MCAQMD)

The operator maintains a Permit to Operate with the County AQMD. This permit is reviewed and renewed annually. Any changes or additions to equipment powered by internal combustion engines require an amendment to the existing permit. The MCAQMD has authority regarding fugitive dust and naturally occurring asbestos. MCAQMD permits are provided in Appendix D.

North Coast Regional Water Quality Control Board (RWQCB)

The RWQCB is responsible for Section 401 of the Clean Water Act, which requires certification for the fill of any wetlands or Jurisdictional Waters of the U.S. in support of a 404 application, or for wetlands or waters under state jurisdiction, if applicable for quarry expansion.

State Water Resources Control Board (SWRCB)

The agency oversees the General Permit for Storm Water Discharges Associated with Industrial Activities (Water Quality Order Number 2014-0057-DWQ, NPDES No. CAS00001). The facility is currently covered under this permit; the Notice of Intent is provided in Appendix D.

State Department of Conservation, Office of Mine Reclamation (OMR)

The Project *Mining and Reclamation Plan* is submitted to the Office of Mine Reclamation for review and comment. OMR provides technical assistance to ensure the reclamation plan meets SMARA and CCR standards.

California Department of Fish and Wildlife (CDFW)

A Lake and Streambed Alteration Agreement, pursuant to Section 1602 of the state Fish and Game Code, would be required for any work involving streams. In addition, if endangered species as listed under the California Endangered Species Act would be significantly impacted, a Section 2081 Management Authorization may be required.

California Department of Transportation (Caltrans)

Caltrans reviews the Project traffic study and considers potential project-related impacts to Highway 101 at Geysers Road.

U.S. Army Corps of Engineers (Corps)

A Section 404 Permit would be required if the project involved the dredging or filling of Waters of the U.S. under the Clean Water Act.

U.S. Fish and Wildlife Service (USFWS)/National Marine Fisheries Service (NOAA Fisheries)

Before granting a permit, the Corps would consult with these agencies to obtain concurrence with their decision to issue the permit. If there were potential impacts to species or migratory fish listed under the federal Endangered Species Act, then a consultation under Section 7 of the Endangered Species Act may be required.

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Syar Industries, Inc. (Applicant) is requesting approval of a Use Permit Renewal/Modification and Reclamation Plan from the County of Mendocino to allow the continued extraction of rock from an existing hillside quarry and processing of rock and recycle aggregate products for a 30-year period. The facility provides a variety of virgin and recycled aggregate products to local builders, Caltrans, and Mendocino and Sonoma Counties.

Use Permit #U 10-95 currently governs the existing quarry, allowing for a maximum extraction and processing rate of up to 75,000 cubic yards (CY) of rock per year over a 20-year period, an annual average of 50,000 CY and a cumulative total of 1,000,000 CY. Production of aggregate products at the facility includes extraction, crushing and screening. Washing is allowed under #U 10-95, however has not been conducted. Saleable products include riprap, processed rock available in a variety of sizes, and recycled aggregate products. Recycled material was not specifically addressed in the original use permit.

The Applicant is requesting to increase the annual permitted extraction (in-situ) volume from 75,000 cubic yards to 200,000 CY, an increase of 125,000 CY per year. The application also includes the import of 40,000 CY per year of recycle materials (reclaimed asphalt and concrete) and 10,000 CY per year of soil. The maximum processing volume would be increased from 75,000 CY to 220,000 CY per year. This volume would include materials extracted on site from the quarry (200,000 CY) minus an estimated 10 percent fines (20,000 CY) plus imported recycled materials (40,000 CY). The maximum volume of finished product generated annually will be approximately 348,000 CY. The maximum cumulative volume of material extracted over the 30-year term would be 6,000,000 CY. Maximum extraction and processing volumes would remain the same throughout the quarry's 30-year term; the Project will not be phased.

1.2 PROJECT OBJECTIVES

The objectives of the Project are to:

- Continue profitable operation of the existing Blue Ridge Rock Quarry by providing a local, reliable, affordable, and consistent source of native and recycled aggregate to customers in the Mendocino-Sonoma County region;
- Extend the life of the existing quarry in a location where potential environmental effects can be avoided or minimized without rendering the Project economically infeasible;
- Extend the life of the existing quarry in such a manner as to increase production of high quality virgin and recycled aggregate in conformance with state and local goals and objectives, including the Mendocino County General Plan;
- Increase the annual permitted extraction of high quality rock materials in order to meet local demand with local resources;
- Extend the life of the existing quarry and in so doing aid implementation of state and local goals to reduce the loss of high quality productive agricultural land as well as minimize greenhouse gas emissions and fossil fuel use by providing a local aggregate resource;

- Reuse available recycled materials to minimize landfilling, and to limit greenhouse gas effects in the region resulting from unnecessary landfilling; and
- Establish an end use for the land that is compatible with surrounding land uses and does not constrain future mining should it be desired.

In order achieve these goals the applicant is requesting the County of Mendocino to grant an entitlement for a Surface Mining Use Permit Renewal/Modification and Reclamation Plan Amendment to allow for:

- The extraction of up to 200,000 CY/year of in situ aggregate per year;
- The import of up to 40,000 CY/year of recycled asphalt, concrete and/or other aggregate materials;
- The importation of up to 10,000 CY/year of soil;
- Processing of a maximum of 220,000 CY/year (crushing, screening and sorting) of virgin and recycled materials;
- Production of up to 348,000 CY (441,400 tons) of finished product annually¹;
- A 30-year term for the entitlement; and
- A minimum 35-year term for the reclamation plan to account for post-reclamation monitoring until success criteria are achieved.

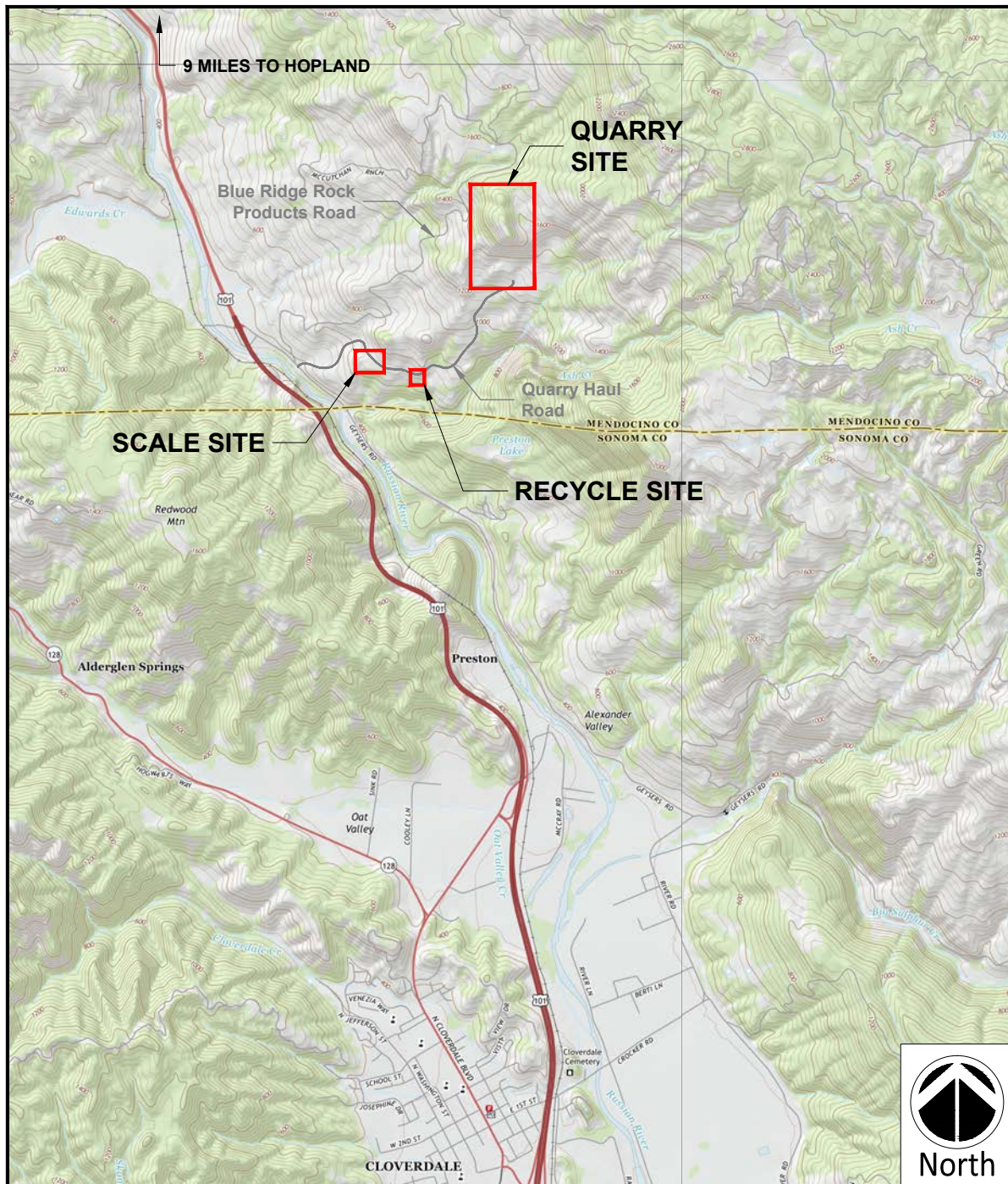
2 PROJECT DESCRIPTION

2.1 LOCATION

The Blue Ridge Rock Quarry is located in southern Mendocino County approximately 3.5 miles north of the City of Cloverdale and 10 miles south of the town of Hopland, as shown on the Cloverdale, California 7.5' USGS topographic quadrangle (Figure 1). The entrance to the Project site is located 1,250 feet north of the Mendocino-Sonoma County line and ¼ mile east of Highway 101 at 24951 Geysers Road (CR 101A). The Project site lies within a 1,626-acre ranch owned by James F. and Gloria J. McCutchan Trustees on portions of Assessor Parcel Numbers 050-350-23,-24; 050-410-40,-41; 050-450-26; and 050-460-05,-06,-07,-09,-11,-20. *A legal description of mined lands is provided in Appendix J.*

¹ Due to bulking, or the introduction of voids (air space) during processing, the volume of material increases, resulting in a higher volume of finished product when processing is completed, even though the weight of the material remains unchanged.

Figure 1. Vicinity Map



Project Mgr.	CM	10/16/2015
Project Eng.		
Designer		
Checked By	NM	10/16/2015
Drawn By	RH	10/16/2015
By		Date

Map Sources:
 USGS 7.5' Quadrangle, Asti, Sonoma, California, 2015
 USGS 7.5' Quadrangle, Cloverdale, Sonoma, California, 2015
 USGS 7.5' Quadrangle, Highland Springs, Mendocino, California, 2015
 USGS 7.5' Quadrangle, Hopland, Mendocino, California, 2015



SYAR BLUE RIDGE ROCK QUARRY

25025 GEYSERS ROAD
 HOPLAND, CA 95449

Figure 1
Vicinity Map

Project No. 15-218.1
 Scale 1"=3000'
 Date 03/01/2016

2.2 PROJECT BACKGROUND

Blue Ridge Rock Quarry is an existing quarry that has been mined commercially for nearly 20 years. A Surface Mining Use Permit and Reclamation Plan (#U 10-95) was granted to James and Gloria McCutchan by the County of Mendocino on January 18, 1996 for the extraction and processing (crushing/screening/washing) of up to 75,000 cubic yards of rock annually for a 20-year period. The total volume of material permitted for extraction and processing was 1,000,000 CY over 20 years. This cumulative volume was based on an average annual extraction rate of 50,000 CY.

On August 14, 2013, the landowner was granted a Minor Modification to the Use Permit to allow for a 5.5-acre increase in the mining disturbance areas to address access and storage and to provide a one-time allowance of imported soil. The total disturbed area, including haul roads, processing, storage and mining areas under the existing operation is 41.5 acres. The current use permit expired January 28, 2016. On January 8, 2016 Syar Industries applied for an extension to continue operating under the existing Mining and Reclamation Plan (MRP) until a new MRP was submitted. The County of Mendocino has a policy of allowing mines to continue operating after expiration of the use permit as long as a renewal of the entitlement is actively in progress at the time of expiration.

The quarry has been operated by the McCutchan Family in cooperation with other operators from 1998 to the present. In 2014, Syar Industries became the operator of Blue Ridge Rock Quarry and has operated the facility since that time. The new operator has made improvements to roads and stormwater features and has replaced mobile and portable processing equipment with newer, cleaner and more efficient equipment.

The Project site contains subsurface materials that are suitable for use in the production of aggregate materials, including ready-mix concrete, asphalt concrete and raw hard rock materials suitable for road base, drainage and erosion control applications, and rock slope protection (rip rap). Blue Ridge Rock Quarry mines predominantly greywacke sandstone.

Historic volumes produced from the quarry each year have varied widely over the last 20 years since the operation began. Based on the last ten years of operation², the average annual production at the existing operation is approximately 35,798 tons or 27,537 cubic yards³. These are the figures used to establish baseline production levels. During this 10-year period, peak production at the quarry occurred in 2006, with reported annual production of 73,200 tons or 48,800 CY of material.

The cumulative volume of material produced from the quarry during the 20-year period between 1996 and 2015 is estimated to be approximately 506,000 CY⁴, or a little over half of the 1,000,000 CY permitted under the original use permit. Existing conditions are shown on Sheet MRP-3 (Appendix B).

² (Dept. of Conservation 1996-2014)

³ The conversion factor used by the operator during this period was 1.5 tons per cubic yards.

⁴ Reported in tons and converted to cubic yards. The cumulative tonnage reported is 758,230 tons.

2.3 TYPE OF MATERIAL BEING MINED

Blue Ridge Rock Quarry is located on a rock “core” sitting within a deposit Jurassic to Cretaceous age Franciscan Formation rock. The primary resource material being mined includes two different types of sandstone classified as meta-graywacke and graywacke. This material is used in production of aggregate materials.

2.4 MINING AND RECLAMATION

The Mining and Reclamation Plan (MRP) for the Blue Ridge Rock Quarry expansion was prepared pursuant to the State Mining and Reclamation Act (SMARA) and Chapter 22.16 of the Mendocino County Code. This Mining and Reclamation Plan consists of text and graphic descriptions of excavation and rock processing, in addition to the reclamation activities to be accomplished during and following the permit period. The site will be reclaimed as open space consistent with surrounding land use when mining is complete.

Mining will expand beyond the boundaries of the existing mining area by about 630 feet and lower the quarry floor by approximately 30 feet *to about 1250 ft above MSL*. The upper slopes of the quarry will be excavated to the north and west along the ridgeline, and the quarry floor will be lowered and expanded further to the north. Overburden generated by the excavation that is not sold as an aggregate product will be stored in soil storage areas for future use in reclamation.

The mining plan involves the continued operation of a hillside quarry, including the crushing and screening of virgin and imported aggregates to a variety of sizes for different applications. A wash plant is not being proposed. The mining operation will continue to produce aggregate used in the manufacture of a variety of aggregate products, including asphaltic concrete and Portland Cement Concrete, rip-rap, drain rock, road base and sub-base material, trench backfill, and general fill. Reclamation of the quarry will be completed concurrently with mining in those areas where the final ground configuration is reached and the area is not involved in ongoing mining operations. Reclamation will be performed at the end of the permit term and includes removal of equipment and remaining aggregate stockpiles, ripping or scarifying surfaces to prepare for revegetation, rough grading to achieve proper drainage and planting surface, resoiling and planting of woody vegetation, and seeding with native grasses for erosion control.

2.5 PRODUCT VOLUMES

Extraction volumes will increase to a maximum of 200,000 cubic yards of in situ aggregate per year for a 30-year period for a cumulative volume of 6,000,000 CY. Processing volumes will likewise increase. It is assumed that 10 percent of mined material will consist of overburden, leaving 180,000 CY of virgin material for processing. Processing methods include running material through a series of crushers, screens and conveyors (smaller material) and sorting material manually using an excavator (larger material). Of the 180,000 CY, an estimated two-thirds will consist of small aggregate to be crushed and screened, and approximately one-third will consist of large rock, which will be sorted manually using an excavator. A maximum of 40,000 cubic yards of recycled aggregate will be imported to the site and processed annually. Combined, up to 220,000 cubic yards of virgin and recycled aggregate materials would be processed each year. A comparison of baseline and Project material volumes are provided in Table 1.

TABLE 1. EXISTING AND PROJECT VOLUMES

Volume (cubic yards)	Baseline	Project
Annual extraction, permitted maximum	75,000	200,000
Annual extraction, permitted average	50,000	200,000
Annual extraction, actual average	27,537	N/A
Cumulative volume over permit term, permitted	1,000,000 (20 yr)	6,000,000 (30 yr)
Cumulative volume over permit term, actual	550,740 (20 yr)	N/A
Annual processing, native material	27,537 ⁵	180,000
Annual processing, recycled material	0	40,000
Annual processing, all materials	27,537	220,000

The volume of *finished saleable product* will be larger than the volume of extracted or processed material provided in Table 1, due to *bulking*. When material is processed it increases in volume. Processing the solid rock breaks it into pieces and creates voids, which results in processed rock having a greater volume than the same rock in-situ. This expansion in volume is referred to as *bulking*. *Bulking factors* are used to estimate volumes of the final products in order to determine capacity for trucking. Based on the densities of in-situ and processed rock generated at the quarry, the bulking factor is approximately 1.78 for small processed rock and 1.72 for large rock product and riprap. When these bulking factors are applied to the 180,000 CY of in-place rock the saleable or finished product volume becomes 317,003 CY.

Conversely, imported recycled material reduces in volume as it is processed, arriving at the site in large pieces and crushed into smaller ones. With a bulking factor of 0.77, the 40,000 CY of recycled material is reduced to a volume of 30,769 CY. The sum volume of all aggregate materials after they are processed becomes 347,772 CY annually. The volume of finished product anticipated by the Project is summarized in Table 2 below.

TABLE 2. FINISHED PRODUCT VOLUMES

Material by Fraction	Annual Production (CY)
Total Virgin Material Excavated	200,000
Rock Fraction (in situ) ⁶	180,000
Small Rock Fraction after Processing ⁷	214,080
Large Rock Fraction after Processing ⁸	102,923
Recycle Material after Processing	30,769
Total Finished Product (Maximum Trucking Volume)	347,772

⁵ Based on a 10-year average, 2006-2015

⁶ Topsoil and overburden are excluded from this figure, comprising about 10 percent of the total mined volume.

⁷ Sixty percent of the 200,000 CY of extracted rock will become small rock; bulking factor is 1.78.

⁸ Thirty percent of the 200,000 CY of extracted rock will become riprap; bulking factor is 1.72.

Aggregate materials produced at Blue Ridge Rock Quarry are sold by the ton. The maximum annual production at the quarry would be 441,400 tons.

2.6 ESTIMATED LIFE OF THE OPERATION

The applicant is requesting a Use Permit with a term of 30 years and a Reclamation Plan with a term of 35 years to include 5 years of monitoring following site closure and reclamation. The reclamation plan term would be extended beyond 5 years if success criteria are not met and remedial measures are implemented. The reclamation plan will be complete when the success criteria and performance standards described in this plan have been met and the County of Mendocino and the Department of Conservation have released financial assurances. Because there will be extractable resources remaining at the end of the requested 30-year permit term, it is anticipated that there will be an application to continue mining at this location prior to the end of the 30-year permit being requested.

2.7 END USE

The quarry will be reclaimed to establish an end use of open space, consistent with the natural landscape of the surrounding property. A total of 37.54 acres will be reclaimed. Approximately 20.77 acres, including access roads and sediment basins, will remain for ranch use and will not be reclaimed. The perimeter of the site and the upper wall areas are designed to provide an adequate factor of safety for the end use of open space. The reclaimed areas, as shown on Sheets MRP-9 and -10 (Appendix B), will be covered with topsoil, planted, seeded, and mulched in accordance with the specifications described in Section 5. Most of the sediment basins will be cleaned of sediment and retained for use as stock ponds for livestock. Others will be filled, graded and vegetated to grasslands. Oak woodland species will be planted on the quarry benches and upper slopes to blend with the adjacent landscape.

3 ENVIRONMENTAL SETTING

3.1 SITE CONDITIONS

The Project site is located within a rural region in Mendocino County, a few miles north of the Alexander Valley. Traveling north from Cloverdale the valley narrows and the topography steepens. Agricultural production transitions from predominantly viticulture to low-density livestock production, primarily grazing lands. The Project site is located within the Russian River Watershed and drains to the Russian River through storm-water basins, ephemeral drainage courses, culverts and grasslands.

The Project site is located within a 1,626-acre ranch that is currently developed with several residences, ranch roads, a livestock operation and the quarry operation. The elevation of the site ranges from approximately 400 feet above mean sea level (MSL) at the site entrance to 1,800 feet at the top of the ridge. The quarry is situated approximately 1 ¼ mile from Highway 101 and 1200 feet in elevation above Hwy 101. Distant views to the quarry are available from Highway 101 for a brief period, though not prominently due to the viewing angle, distance and elevation difference from the highway to the mountaintop.

Disturbance associated with the existing quarry operation has occurred at the Project site. The site has a well-established rocky access road with graded shoulders that support little or no vegetation. Inboard

and outboard ditches occur along the access road as mitigation for quarry runoff; sediment detention basins are also present in multiple places along the access road.

3.2 ZONING AND LAND USE

The Project site lies within an area of Mendocino County consisting of large upland agricultural parcels. The General Plan designation for the parcels within which the Project Site is located is Rangeland (RL160 – 160 acres minimum parcel size). The zoning is Rangeland (RL). Surrounding General Plan designation and zoning on all sides is Rangeland with lands used for agriculture, primarily livestock and vineyards.

The density of residential units in the area surrounding the Project site is very low. A small 16-lot subdivision is located approximately one (1) mile south of the Project site, in Sonoma County. The nearest offsite residence is located approximately 0.5 miles north of the quarry expansion limits. To the south the nearest residence is located approximately 0.8 miles from the Project site. The nearest residence to the east is approximately two miles from the quarry.

There are no commercial or other industrial activities except for a private campground located about 0.5 miles south of the Project site on the Russian River in Sonoma County.

Per Section Sec. 20.060.025 of the Mendocino County Zoning Code, surface mining and processing are allowed in the Rangeland zoning district subject to County approval of a major use permit. The existing rock quarry has been operating for almost 20 years under a use permit and mitigated negative declaration approved by the County on January 18, 1996.

The majority of lands within the 1,626-acre McCutchan ranch are in Type II (non-prime) Agricultural Preserve as shown in Appendix A. The parcels upon which the existing Quarry Site and Scale Site lie (APN 050-410-40, 050-350-23) are *not* under Williamson Act contract. The existing haul road and the bulk of the quarry expansion area are located on parcels under Williamson Act contract, primarily APNs 050-410-40, 050-410-41 and 050-450-26. Approximately 14 acres of lands under Williamson Act contract would be disturbed by mining as shown in Exhibit 2 in Appendix A.

3.3 SITE ACCESS

Vehicles access the Project site from Highway 101 (US-101) at the Geysers Road exit. At this location US-101 is a four-lane highway. The quarry operation is accessed via a private driveway (haul road) located approximately ¼ mile southeast from the intersection of Geysers Road and US-101. Portions of this road serve as access for the working ranch.

Exiting US-101 from the southbound lanes is a right turn deceleration lane that turns into a two-lane road that winds southeast under the highway to a stop sign at Geysers Road. Cross traffic does not have a stop sign. The speed limit on this segment of Geysers Road is 35 miles per hour (mph). Vehicles turn right onto Geysers Road, travel for 0.25 miles, and turn left into the Project site driveway.

Exiting US-101 from the northbound lanes is a right turn deceleration lane. The exit lane turns into Geysers Road. In 0.30 miles, the Project site driveway is on the east side of the road, requiring a left turn across Geysers Road.

Exiting the Project site for US-101 south, vehicles follow the same route used to enter the facility. There is a stop sign at the entrance to US-101 followed by an acceleration lane to enter the freeway. The US-101 grade steepens at this location to approximately 6 percent as it climbs Redwood Mountain.

Exiting the Project site for US-101 north, there is a stop sign at the junction of Geysers Road and the freeway entrance followed by an acceleration lane to enter US-101.

All vehicles exiting the operation must turn right onto Geysers Road to access Highway 101. Access to the Project site is controlled by a gate at the entrance, which is locked when the operation is closed for business.

It is estimated that the Project will result in approximately 60 percent of outbound trucks traveling south on Highway 101, with approximately 50 percent of these traveling to markets in northern Sonoma County, and approximately 10 percent exiting west at State Highway 128 to markets in southwestern Mendocino County. Approximately 40 percent will travel north on Highway 101 to markets in southern Mendocino County.

3.4 CLIMATE

The climate in the area is considered Mediterranean, characterized by generally moderate temperatures with wet winters and dry summers. Average annual precipitation is about 42 inches, although greater amounts of precipitation occur at higher elevations within the region, including over parts of the quarry property. Precipitation in the area occurs as rainfall, primarily during the months of November through March.

3.5 GEOLOGY AND SOILS

The site is located within the Coast Range geomorphic province, characterized by strong, northwest trending ridges and valleys. The dominant rock type is mapped as Jurassic to Cretaceous age Franciscan Formation, comprised of sandstone, shale, chert, greenstone, meta-graywacke and conglomerate. The regional rock structure (bedding/foliation) trends north-northwest, with highly variable dip angles⁹.

Landslides are common throughout the region and are mapped extensively along the west flank of quarry, extending to the Russian River about one mile west (near Hwy 101). The active quarry face and exposed rock at the top of the ridge contain mostly fractured graywacke and meta-graywacke, with some sporadic areas with shale. There are no active faults mapped within the quarry limits and the site is not within an Alquist-Priolo Earthquake Fault Zone as mapped by the California Geological Survey. The nearest active fault is the Maacama Fault System, located approximately 0.8 miles east of the site. The peak ground accelerations for the Project site is estimated to be 0.44g.

The predominant soil types¹⁰ within the project limits are Hopland-Witherell-Squawrock complex, 30 to 50 percent slopes underlying the quarry area and Yorkville-Yorktree-Squawrock complex, 30 to 50 percent slopes underlying areas west of the quarry (haul road, scale site, recycle site). Both soil types

⁹ (Crawford & Associates 2016)

¹⁰ (USDA-NRCS 2015)

contain mostly soils classified as loam and clay soil, with a hydraulic soil group rating of C to D.

3.6 VEGETATION

The biological communities at the Project site and adjacent land include broadleaved upland forest, cismontane woodland, North Coast coniferous forest, non-native grassland, chaparral, seasonal wetland, and intermittent and ephemeral drainages. Barren or disturbed areas and roads are also present. A map of the biological communities, roads and barren areas was prepared for the Biological Resources Study prepared for the Project¹¹ and is provided as Exhibit 3 in Appendix A. The Project has been designed to avoid stream crossings and water diversions as well as impacts to wetlands and watercourses. Table 3 provides a description of the communities present within the biological study area and the acreage of each community that will be impacted by the project.

TABLE 3. NATURAL COMMUNITIES

Natural Community (DFG Alliance; rarity rank) ¹	Acreage in Study Area	Acreage Impacted by Project
Broadleaved Upland Forest (G4 S4) ²	74.58	8.10
Cismontane Woodland (G4 S3) ²	6.92	0.08
North Coast Coniferous Forest (G4S4)	2.94	1.12
Chaparral (G5S5) ²	4.65	4.62
Non Native Grassland	41.92	1.77
Pond/Seasonal Wetland (G3S3)	0.90	0
Potential Seasonal Wetland	0.27	0
Stream / Watercourse	unknown	0
Total	132.18	15.69
Other		
Catchment Basins	0.22	0
Barren / Disturbed	33.07	25.08
Total:	165.47	40.77

¹ DFG (2010) considers a community with a global rank of G1, G2, or G3 or a state rank of S1, S2, or S3 to be of concern and included in CNDDDB.

² These communities include oak woodland.

Source: NCRM, 2016

No special-status plant species were located during floristic surveys. Database queries reported a total of 41 special-status plant species that may have some potential to occur within or near the project area. Of these reported species, 29 were found to have suitable habitat within the Project study area, but none of the plants were encountered. Approximately 1.12 acres of North Coast coniferous forest will be removed by the Project. While not a natural community of concern, a conversion permit or conversion exemption will be required for permanently removing timberland in California.

¹¹ (NCRM 2016)

3.6.1 OAK WOODLAND

When the project is fully developed it will impact approximately 138 oak trees greater than 5" dbh through direct removal within the grading limits and soil storage locations (disturbance areas). Table 4 lists the maximum number of true oak trees by species to be removed by the Project.

TABLE 4. OAK TREE REMOVAL WITHIN PROJECT DISTURBANCE LIMITS

Tree Species		Number of Trees to be
Common Name	Scientific Name	Removed ¹
Canyon live oak	<i>Quercus chrysolepis</i>	64
Coast live oak	<i>Quercus agrifolia</i>	6
Interior live oak	<i>Quercus wislizeni</i>	13
Black oak	<i>Quercus kelloggii</i>	5
Oregon white oak	<i>Quercus garyanna</i>	43
Blue oak	<i>Quercus douglasii</i>	7 ²
Total		138

¹ Oak trees were inventoried within the Project footprint provided by Crawford & Associates, Inc. Oaks within the Project Area and a 20-foot buffer were measured (to account for driplines), tagged, and mapped during site surveys.

² Includes 3 hybrid oaks.

Source: NCRM, 2016.

The Oak Woodlands Conservation Act (PRC Section 21083.4) provides a list of measures that a county may require to mitigate the removal of oak woodlands. These include replacement tree planting, the use of conservation easements, contributing to the Oak Woodlands Conservation Fund and/or other mitigation measures developed by the County. The reclamation plan includes the planting of nine (9) acres of oak woodland, or 325 individual trees, when mining is complete in 30 years. With a goal of 30 oak trees per acre, reclamation will result in the addition of at least 276 oak trees, or a 2:1 replacement ratio.

The Oak Woodlands Conservation Act limits replacement planting to no more than half of the mitigation for a Project; therefore additional mitigation would need to be implemented. A contribution to the Oak Woodlands Conservation Fund or other acceptable organization will be made for the equivalent value of half of the oak trees to be removed or 69 trees. The contribution would be computed based on the following County-approved formula:

$$\text{___ acres} \times \text{current land value} \times 0.05 \text{ (County administrative fee)}$$

Methods of establishing current land value that have been accepted by the County include: (a) appraisal of the woodland area impacted or (b) sale values for comparable property which are located in the same general area.

3.7 FISH AND WILDLIFE

Aquatic features within and surrounding the Project site include small seasonal ponds, ephemeral and intermittent stream channels, and multiple sediment basins. Some of these features have suitable habitat for the northern western pond turtle, foothill yellow-legged frog, and a wide variety of benthic

macro-invertebrates. Aquatic conditions vary widely depending on the season, with little or no water present in most aquatic features during the summer and fall seasons.

According to the Biological Resources Study¹² a total of 32 sensitive fish and wildlife species may have some potential to occur within or near the project area. Of the reported species, two California Species of Special Concern, the foothill yellow-legged frog (*Rana boylei*) and northern western pond turtle (*Actinemys marmorata*) were observed in the Project study area. Nine additional species have the potential to be in the vicinity: Central California Coast Steelhead (*Oncorhynchus mykiss irideus*), white-tailed kite (*Elanus leucurus*), golden eagle (*Aquila chrysaetos*), American peregrine falcon (*Falco peregrinus anatum*), sharp-shinned hawk (*Accipiter striatus*), grasshopper sparrow (*Ammodramus savannarum*), Townsend's big-eared bat (*Corynorhinus townsendii*), pallid bat (*Antrozous pallidus*), and the American badger (*Taxidea taxus*). All of these species have some potential to occur (either high or moderate), as suitable habitat exists within or near the Project area. Species that were rated as having a moderate to high potential to occur within the BSA are discussed below. The remaining 21 species have little to no chance of occurring due to the lack of suitable habitat within or near the BSA. This includes the federally listed northern spotted owl (*Strix occidentalis caurina*) with the nearest known location over 10 miles from the project, and for which the habitat within the project is unsuitable.

In addition to the special status species reported, the project is within the vicinity of habitat designated as 'Critical Habitat for Steelhead in the Northern California ESU' by the National Marine Fisheries Service (NMFS).

3.7.1 NORTHERN CALIFORNIA STEELHEAD

An unnamed tributary located along the eastern flank of the quarry flows south into Ash Creek, a tributary to the Russian River. The upper limits of anadromy of the *Northern California Steelhead* (*Oncorhynchus mykiss*) is estimated to be 1000 feet downstream from the Project site, at the confluence of Ash Creek. Northern California steelhead trout are listed as Threatened under the federal Endangered Species Act. Due to the steep gradient of the tributary and lack of water for much of the year, potential impacts to steelhead from the Project would be indirect, in the form of sediment delivery to downstream habitat. The Project will avoid the tributary and will establish and maintain a 50-foot vegetated buffer between the edge of the tributary and the easterly grading limits. Site grading directs surface runoff internally towards the quarry floor, and a perimeter sediment barrier will be installed along the eastern edge of the grading limits to protect the tributary from sediment delivery. The Project as designed is not expected to impact watercourses.

3.7.2 NORTHERN WESTERN POND TURTLE

Northwestern pond turtles (*Actinemys marmorata*) were observed in a spring overflow pond located in the southeast corner of the mine boundary. The pond is used to capture overflow that cannot be contained in water storage tanks and serves the operation only as an emergency or back-up water source. Turtles are protected from being drawn through the intake pipe during drafting by the use of a screen placed over the pipe entrance.

¹² Ibid, 18

3.7.3 FOOTHILL YELLOW-LEGGED FROG

Foothill yellow legged frogs (Rana boylii) (FYLF) were observed in a sediment basin that provides stormwater retention and treatment for the quarry operation. Frogs could potentially be disturbed during sediment removal, which is typically performed on an annual basis. FYLFs will be protected by implementing an employee training and monitoring program that requires field personnel to be trained in the identification of FYLF. Prior to sediment removal, basins will be inspected for presence of FYLF. If observed, a biologist would be called to relocate the frogs to an appropriate location, after which cleaning of the basins could be conducted.

3.7.4 BIRDS

A golden eagle was observed during the survey period. There were no other special-status bird species observed; however, suitable habitat exists within the Project area for the following avian species:

White-tailed kite (*Elanus leucurus*)
Golden eagle (*Aquila chrysaetos*)
American peregrine falcon (*Falco peregrinus anatum*)
Sharp-shinned hawk (*Accipiter striatus*)
Grasshopper sparrow (*Ammodramus savannarum*)

Mitigation measures have been prescribed in the form of pre-construction surveys and subsequent action for positive findings. Land use practices that remove trees during the nesting season may be detrimental to these species. Vegetation is generally scheduled to be removed outside of the nesting season, however if vegetation must be removed during the nesting season (February 15-August 31) a pre-construction survey will be conducted by a qualified biologist prior to vegetation removal. If an active nest site is documented, a no-impact buffer will be implemented until the nest is no longer active or consultation with California Department of Fish & Wildlife has occurred and a directive has been given.

3.7.5 BATS

The two bat species with the potential to occur within the project area are the Townsend's big-eared bat (*Corynorhinus townsendii*) and pallid bat (*Antrozous pallidus*). Neither of these species were observed during the wildlife survey. Due to the high level of concurrent disturbance in the area, bat species are unlikely to roost in the BSA. However, with the consideration of the proposed listing of the Townsend's big-eared bat, pre-construction surveys will be performed as described in the previous section prior to demolition or removal of old or abandoned structures, the results of which will be followed by avoidance mitigation if special status species are present.

3.8 CULTURAL RESOURCES

Cultural resource surveys were conducted on the Project site in 1995 and 2015^{13, 14}. There were no cultural resources found during either of the surveys. The 2015 report stated, "Much of the study area is marked by relatively steep slopes that were uninhabitable. Few bedrock outcrops or boulders were found

¹³ (Flaherty 1995)

¹⁴ (Origer 2015)

that could have been utilized for creation of bedrock mortars or rock art. A small spring/seep was found in an area of relatively gentle terrain, but no archaeological site indicators were found there."

In the event that unknown archaeological resources or human remains are discovered during quarry activities, the operator will implement measures in compliance with the Mendocino County Archaeological Ordinance (Mendocino County Code 22.12.010). The cultural resource survey is provided in Vol. 2.

3.9 HYDROLOGY AND WATER QUALITY

The Project Site is located in the Russian River Hydrologic Unit, Middle Russian River HA, Geyserville HSA. The majority of the site drains to a tributary of Ash Creek, which drains into the Russian River. A number of ephemeral drainages deliver stormwater to Ash Creek and to the Russian River. The Russian River is identified on the 303(b) List of Impaired Waters as impaired for temperature and sedimentation/siltation.¹⁵

Stormwater discharges from industrial sites are regulated by the Federal Clean Water Act by the California State Water Resources Control Board (SWRCB) through the General Permit for Storm Water Discharges Associated with Industrial Activities (Water Quality Order Number 2014-0057-DWQ, NPDES No. CAS00001). In order to be covered under the Industrial General Permit (IGP) and obtain authorization for storm water discharges, a facility operator must submit a Notice of Intent, eliminate unauthorized non-storm water discharges, develop and implement a Storm Water Pollution Prevention Plan (SWPPP) and perform monitoring of storm water discharges. A Notice of Intent for the Blue Ridge Rock Quarry is filed with the SWRCB; the WDID Number for the site is 123I025090.

Syar maintains a SWPPP for Blue Ridge Rock Quarry which is updated whenever significant changes are made, such as additional or modified BMPs (*Appendix H*). The erosion control plans provided in Appendix C identify the erosion and sediment control measures implemented on site to prevent industrial discharges from the site and to protect water quality. A description of mine drainage and erosion control is provided in Section 4.6.

3.10 WATER RESOURCES

A water supply analysis prepared for the Project by Luhdorff & Scalmanini¹⁶ in May 2016 is the primary source for the Water Resources section of the MRP. Baseline water supply data was collected from Project water sources during the operating season of 2015 and provided to Luhdorff & Scalmanini for use in the water supply evaluation. The report is provided in Vol. 2.

3.10.1 PROJECT WATER SOURCES

Groundwater emanating from springs is the source of water supply for the Project. The Project is located on basement Franciscan Complex rocks and is not located within any groundwater basins or subbasins designated by the California Department of Water Resources (DWR). The nearest groundwater subbasin (Cloverdale Area Subbasin) is about 1.5 miles from the Project area and is rated as very low priority by

¹⁵ (SWRCB 2016)

¹⁶ (Luhdorff & Scalmanini 2016)

DWR based on risk factors relating to pressure on groundwater. The area typically receives more than 45 inches of annual precipitation and the hydraulic properties of the soils suggest there is potential for considerable infiltration of precipitation and percolation of groundwater recharge.

Many springs exist across the Project property and are quite common in the region. Water resources in the area are closely tied to climatic conditions and fluctuate in response to processes associated with precipitation runoff and groundwater recharge in combination with consumptive uses (e.g., diversions, withdrawals, evapotranspiration) placed on these resources.

Historical quarry operations have been supplied entirely by groundwater from four spring sources located on the McCutchan property. The existing water distribution system for the Project consists of two somewhat independent water systems supplied by springs: an upper water supply system and a lower water supply system. The upper system is primarily used to supply water for the quarry and processing plant whereas the lower system is used primarily for filling of water trucks for road dust suppression.

The upper water supply system consists of two springs located on hill slopes to the east above the quarry that flow by gravity through 2-inch PVC piping to a series of storage tanks on the quarry floor. Overflow from the final tank is released into a collection basin at a third spring, which is equipped with a 2-inch intake pipe so overflow water can be reused if needed. Water storage within the upper water system is provided primarily by four in-line tanks totaling 72,000 gallons of capacity.

The lower water system delivers water to the Scale Site, and is supplied by a spring located on a hill slope south of the quarry floor along the main access road. The spring flows by gravity through PVC piping into storage tanks located on the south side of the Scale Site. Water storage capacity in the lower water system is provided primarily by four in-line tanks totaling 65,000 gallons of capacity. Total existing water storage capacity for the Project is 137,000 gallons.

The lease agreement between Syar Industries and the landowner allows Syar to use water available from these sources, which were previously and historically used to supply water for quarry operations.

3.10.2 WATER DEMAND

Demand for water for the quarry Project is primarily driven by water needed for dust suppression in the processing area and along the main access road. During the processing of quarry rock and recycled material, water is used to limit dust production resulting from crushing operations. This includes spraying of water to settle dust particulates. Along the quarry road, water is used to wet the gravel road base to mitigate dust generated by truck traffic hauling finished material from the quarry.

Water demand for processing is based on the tons of material processed. Recycled material requires approximately 50 percent of the water used for virgin material processing for dust suppression. Water use during the peak operating months of June through October 2015 demonstrated an average consumption rate of 4.31 gallons per ton. The operator estimates that process water use during the off-season (December – May) is approximately one-third of peak season volume, or approximately 1.44 gallons per ton.

Water demand for dust suppression is based on the number of days in operation when site conditions are dry. The dry season and the peak operating season occur during the months of June through

November. Water use data collected during the 30 highest consumption days of the peak dry period of 2015 indicated that 15,200 gallons per day were used for dust suppression. Consumption peaked at 15,200 gallons per day and averaged 7,232 gallons per day for the remaining days in this period. The operator estimates that off-season water use for dust suppression averages approximately 2,500 gallons per day.

The water supply evaluation concluded that the rate of spring flow is estimated to be more than Project water demand during all months except for August of the driest years. However, even during the driest of years, water storage tanks are expected to remain full through July. As a result, during such critically dry years, any deficit of supply that may occur in August can be met by borrowing water from storage. The water supply evaluation is provided in Vol. 2.

3.11 ELECTRICITY AND LIGHTING

Electricity is transmitted across the property on power poles owned and maintained by Pacific Gas & Electric (PG&E). Two power poles are located within the quarry expansion area as shown on the Quarry Grading Plan (Sheet MRP-7, Appendix B). Grading has been designed to avoid relocation of the poles.

Quarry activities, particularly haul-out, may occur at night. Nighttime operations may be required during an emergency, such as flooding, for large projects on a tight schedule (i.e.; Caltrans projects) or when projects are being constructed at night. Nighttime operations would require lighting for worker safety. Plans for illuminating the work area include the installation of portable, self-generating lights placed above the work area with light cast downward. Lights would be positioned in accordance with applicable Occupational Safety and Health Administration (OSHA) and Mine Safety and Health Administration (MSHA) safety standards and in locations that would minimize light and glare off-site to the greatest extent feasible.

3.12 SANITARY SYSTEMS

The Project site is not equipped with a septic system. The operator currently provides portable chemical toilets for employees at both the Scale Site and the Quarry Site, which are serviced regularly by a septic service provider. Portable restrooms will continue to be the sole sanitary facilities used on site; the development of a septic system for permanent restrooms is not proposed.

3.13 TRAFFIC

Offsite traffic associated with existing mining activities includes haul trucks transporting rock products, delivery of fuel and supplies, and employees. The Project will generate additional vehicle trips due to increased production volumes, importation of recycle material and soil, and a small increase in the number of employees at the site. This data is summarized in Table 5. A Traffic Impact Analysis Report was prepared by Omni Means in July 2016, and is provided in Vol. 2.

TABLE 5. BASELINE AND PROJECT TRIP GENERATION

Peak Daily Trips		BASELINE (EXISTING)		PROJECT (PROPOSED)	
		AVERAGE	MAXIMUM	AVERAGE	MAXIMUM
Processed Rock	Trucks/day	20	29	123	181
Recycled Import and Soil	Trucks/day	0		10	15
Fuels/Supplies	Trucks/day	1	1		6
Employees	Cars/day	3	5	7	10
Other (specify)	Cars/day	1	1	1	2
Total Vehicles/Day	Vehicles/day total	25	36	141	214
Total Trips/Day	Trip ends/day total	49	72	282	428
Peak Hourly Trips					
Processed Rock	Trucks/hour	2	3	12	18
Recycled Import and Soil	Trucks/hour	0	0	1	1
Fuels/Supplies	Trucks/hour	1	1	1	2
Employees	Cars/hour	1	2	2	3
Other (specify)	Cars/hour	0	0	1	1
Total Vehicles/Hour	Vehicles /hour	2	4	17	25
Total Trips/Hour	Trip ends/hour	5	7	34	50

Under existing conditions all intersections and mainline segments and ramps in the study area were found to be operating at acceptable LOS¹⁷. Based on the above trip generation data, the traffic report evaluated short term conditions, short term plus Project conditions, cumulative conditions and cumulative plus Project conditions to determine impacts at each of the study intersections. Results demonstrate that all study intersections are projected to operated at acceptable LOS and do not exceed significance thresholds under Caltrans, Mendocino County or Sonoma County Guidelines.

3.14 AIR QUALITY

The applicant has an existing Air Quality Permit to Operate from the Mendocino County Air Quality Management District (MCAQMD) for the existing operation (Permit No. 1290-5-01-15-12, Appendix D). The permit covers the “aggregate processing facility with extraction, crushing and screening equipment and associated Tier 3 and Tier 4 prime power diesel internal combustion engines.” Using project equipment and traffic data, a study was prepared to evaluate baseline and project air quality, including greenhouse gas emissions (GHG)¹⁸. The assessment determined the project would not result in a significant impact to air quality or GHG (see Vol. 2).

¹⁷ (Omni Means 2016)

¹⁸ (Illingworth & Rodkin 2016)

3.14.1 DUST CONTROL

Dust abatement controls will continue to be in accordance with MCAQMD standards and the facility's Permit to Operate. Fugitive dust is minimized by implementing the following best management practices:

- Applying a dust suppressant to the main access road twice per year (May and September);
- Using a water truck to wet roads and working areas;
- Wetting the surge pile;
- Maintaining a 15 mph speed limit within the facility;
- Conducting excavations on the upper slopes only when the wind speed is below 20 mph;
- Maintaining permits and ensuring that the quarry is in compliance with the MCAQMD; and
- Utilizing misting systems
 - Each stacker conveyor is equipped with a water misting system to control dust during processing.
 - "Water cannons" or air misters are used on the quarry floor to vaporize airborne dust particles and prevent dust from leaving the site. The machines can spray a fine mist for up to 125 feet horizontally and 50 feet vertically and can oscillate up to 180 degrees.

Wind erosion control is practiced throughout the site. Wind erosion of stockpiled soil materials is minimized by stabilizing stockpiles with the application of seed and mulch.

3.14.2 NATURALLY OCCURRING ASBESTOS (NOA)

As required by the MCAQMD, quarry materials have been tested for the presence of naturally occurring asbestos (NOA) and none was detected. An evaluation of Naturally Occurring Asbestos (NOA) at the quarry was completed in 2012 by LACO Associates¹⁹ (Vol. 2, Appendix E of Geotechnical Report). Three samples were tested for NOA by Test Method CARB 435, with each result below the detection limit of 0.25%. Their conclusion is that the occurrence of NOA within the quarry site is unlikely, however the MCAQMD required the applicant to continue testing for NOA every 15,000 CY up to 150,000 CY. To comply with this requirement, additional NOA testing was conducted in May 2015 and June 2016, reaching 150,000 tons. Samples were collected and analyzed for each 15,000 CY of material by Cornerstone Earth Group. NOA was not detected in any of the samples.

When significant geologic changes are observed during the mining process, a geologist will be consulted to analyze the material for NOA-containing potential and make recommendations as to whether testing should be conducted²⁰.

3.15 NOISE AND VIBRATION

Major sources of noise from quarry operations include mobile equipment and processing equipment. Mobile equipment includes loaders, dozers, an excavator and trucks moving aggregate, including loading and unloading. Processing equipment includes crushers, screens, conveyors and a generator. Typical

¹⁹ (LACO 2012)

²⁰ (Crawford & Associates 2016)

daily operations involve a dozer pushing material off the top of the hill, an excavator sorting the larger material in the rip rap storage area, material processing of smaller aggregate on the quarry floor, and the loading of trucks. There will be up to four blast events per year lasting a few seconds each that may cause vibration. With the increase in extraction and processing volumes, the potential for increased noise and vibration exists. The daytime hours at the quarry will remain the same; however, up to 45 nights of nighttime operations would be allowed for haul-out only.

The density of residential units in the area surrounding the quarry is very low. A small 16-lot subdivision is located approximately one (1) mile south of the quarry, in Sonoma County. The nearest offsite residence is located approximately 0.5 miles north of the quarry expansion limits. To the south the nearest residence is located approximately 0.8 miles from the quarry. The nearest residence to the east is approximately two miles from the quarry. There are no other commercial or industrial activities in the site vicinity except for a private campground located about 0.5 miles south of the quarry on the Russian River in Sonoma County.

A noise analysis conducted by Illingworth & Rodkin, Inc. found that the worst-case Project scenario would not result in noise levels exceeding the maximum levels cited in the Mendocino County General Plan²¹. Due to the distinctiveness of the quarry noise sources and low ambient levels in some areas surrounding the quarry, quarry noise could potentially be audible in some noise sensitive areas. However, noise levels are calculated to be well below the Mendocino County limits and would not typically be measureable above existing ambient noise. Quarry noise is not anticipated to be audible in areas located in the vicinity of Highway 101. While residents may be able to occasionally hear sounds from blasting events, these sounds would continue to occur on an extremely infrequent basis. These brief intermittent events would not be expected to substantially increase hourly average or daily average noise levels. Project generated traffic would not measurably increase existing traffic noise levels (less than 1 dBA L_{dn}) at sensitive receivers along roadways serving the site. Detailed findings are provided in the Environmental Noise and Vibration Assessment in Vol. 2.

3.16 AESTHETICS

The quarry is situated approximately 1-¼ mile from Highway 101 and 1200 feet in elevation above the freeway. A Visual Impact Analysis was conducted for the project and is provided in Vol. 2²².

Distant views to the quarry are available from Highway 101 for a brief period, though not prominently due to viewing angles, distance and elevation difference between the highway and the mountaintop. There are no places on the southbound Highway 101 route where the current or proposed quarry disturbance is visible to southbound drivers.

From northbound 101, the quarry is most visible approaching the crest of Redwood Mountain with an estimated 21 seconds of visual exposure as a view of the quarry emerges from behind large road cuts along Highway 101 until the proposed quarry footprint falls outside of the 180 degree view of the driver. This 21-second exposure has a distance to the quarry between 1.3 and 1.6 miles. Photo 18a in the Visual Impact Analysis (Vol. 2) shows the current view of the existing disturbance from this location. Photo 18b shows the future quarry footprint after 30 years of mining and prior to reclamation. Although the

²¹ (Illingworth & Rodkin 2016)

²² (Light 2016)

distance to the proposed quarry footprint is closer than from the other exposure areas, the nearest distance of 1.3 miles between the driver and the Project coupled with the viewing angle from the roadway reduce the visual impact from the northbound perspective. The dark grey color of the exposed rock further minimizes the viewshed impact. The quarry can be seen from the Cloverdale Depot, however at a distance of 4.3 miles is not a predominant feature in the landscape.

Upon reclamation, the quarry benches and upper slopes will be revegetated to oak woodland, with a mix of oak trees and shrubs that are growing on surrounding property. Though slow-growing, the oaks will eventually provide some softening of the benches to create a more natural looking landscape that blends with the surroundings.

4 MINING OPERATION

4.1 AREA AFFECTED BY MINING

The Project site consists of operational areas and appurtenant facilities which are described in detail in the following sections:

- Quarry Site, includes processing area
- Scale Site
- Recycle Site
- Access roads
- Stormwater features
- Buffers

The total Project site, or area within the *mine boundary*, consists of 90.7 acres. The Project site is approximately 49.2 acres larger than the existing operation. The additional acreage consists of 15.5 acres of new disturbed area within the Quarry Site and 33.7 acres of undisturbed buffer around the operational areas.

The total area to be disturbed by the expanded operation will be approximately 43.0 acres, an increase of 15.5 acres from the current 27.5 acres. Disturbed areas include the Quarry Site, Scale Site, Recycle Site, access roads and stormwater features. New disturbance will involve the Quarry Site only: expanding the quarry limits, product stockpiles and soil storage areas. There is no new disturbance proposed at the Scale Site, Recycle Site or other areas.

The Project provides for 33.7 acres of buffers did not exist under the previous mining plan. This includes an average 50-foot buffer around the perimeter of the Project site including around roads and operational areas where no mining activities will take place. Table 6 provides a comparison of existing and Project acreage.

Reclamation plan activities and final end use will not impact the surrounding land uses of open space and cattle grazing.

TABLE 6. EXISTING AND PROJECT ACREAGE

PROJECT AREAS	EXISTING	END OF PROJECT	DIFFERENCE
Quarry Site	27.5	43.0	15.5
Product Stockpiles	1.1	3.3	2.2
Topsoil Storage	1.0	1.9	0.9
Processing Area	0.5	0.5	0.0
Sediment Basins	0.3	1.1	0.8
Quarry	24.6	36.3	11.7
Scale Site	6.1	6.1	0.0
Product Stockpiles	2.2	2.2	0.0
Topsoil Storage	0.9	0.9	0.0
Scales, office, operational areas	2.5	2.5	0.0
Sediment Basins	0.5	0.5	0.0
Recycle Site	1.9	1.9	0.0
Recycle Storage	1.8	1.8	0.0
Sediment Basin	0.1	0.1	0.0
Haul Road	3.9	3.9	0.0
Other Stormwater Features	0.7	0.7	0.0
Non-Project Ranch Areas	1.4	1.4	0.0
Buffers	0.0	33.7	33.7
TOTAL	41.5	90.7	49.2

Approximately 37.54 acres will be reclaimed when mining is completed. Reclamation areas are described in Section 5.

4.2 FACILITY LAYOUT

The 90.7-acre Project site is situated in the interior of a 1,626-acre working ranch. The Project site is accessed from Geysers Road by means of a 24-foot wide private haul road that serves both the ranch and the mine operations. A separate entrance to the property provides access to the residences and central ranch operations, including residences occupied by the landowner and family, irrigated pasture, barns, access roads and livestock facilities.

The Project site is comprised of several operating areas, material storage areas, office, scale and scale house, the main haul road, access roads, and miscellaneous areas such as those that contain stormwater facilities and drainage features. The three primary operating areas within the Project site include the Quarry Site, Scale Site and Recycle Site. The overall Project site layout is shown in Sheet MRP-4 (Appendix B).

4.2.1 QUARRY SITE

The Quarry Site is located approximately 1.25 miles from the Project site entrance at Geysers Road. The Quarry Site currently encompasses 27.5 acres and consists of the rock quarry, mobile processing equipment, stockpiles of finished products, load-out area, equipment storage, soil storage, water storage tanks and sediment basin.

The quarry operation is situated along the south and east slopes of a rock ridge within the Mayacamas range known as Buck Mountain. A deeply incised intermittent drainage runs in a southerly direction approximately 50 feet from existing quarry limits along the east side. This unnamed tributary flows south to Ash Creek which flows to the Russian River. New grading will not be allowed within 50 feet of the edge of the tributary for the term of the Project and a perimeter barrier will be installed to prevent material from being sidecast into the drainage or the buffer.

The quarry floor is approximately 5,800 feet northeast of and 950 feet in elevation above the Russian River. The quarry floor elevation at the base of the south face is presently about 1,280 feet, with the top of the active face about elev. 1700 feet (approximately 420 feet above the floor elevation). This face is cut at a gradient of about 0.5H:1V with intervening benches about 25 feet wide. The east slope is currently being worked from near the top of Buck Mountain at about elev. 1750 feet, with an active face about 150 feet high. Sheet MRP-7 (Appendix B) shows the current quarry layout. The natural slopes above the active faces are steep (about 1.25H:1V) and extend above the quarry floor to about elev. 1,800 feet.

4.2.2 SCALE SITE

Upon entering the Project site from Geysers Road, the steep haul road gently winds uphill through annual grassland to the first operating area. The Scale Site is comprised of a 5.7-acre terrace and small knoll housing the office, truck scale, material storage, water storage, employee parking and sediment basin. An equipment and vehicle maintenance area is located here and includes a storage container, vehicle parking, and equipment and vehicle storage. Two 500-gallon fuel tanks will be installed on a concrete slab in the northeast corner of this area. The Scale Site is located approximately 0.4 miles from the site entrance, at an elevation of approximately 715 feet above mean sea level (MSL). The Scale Site is approximately 300 feet in elevation above Geysers Road and 400 feet above the Russian River.

A small knoll within the Scale Site will continue to be used for storage. There are no significant changes to the use or size of the Scale Site resulting from the Project. The Scale Site layout is shown in Sheet MRP-4 (Appendix B).

4.2.3 RECYCLE SITE

Located approximately 1,000 feet east of the Scale Site on the south side of the haul road is the 1.9-acre Recycle Site. The Recycle Site will be used to store imported recycled material consisting of reclaimed concrete and asphalt. Material will be stockpiled at the Recycle Site until it is processed. Processing of recycled material may occur at the Recycle Site or at the Quarry Site and the finished product will be stored at the Recycle Site. The Recycle Site sits at about 770 feet in elevation and is surrounded by a perimeter berm. This area will be used exclusively for recycled aggregate. The Recycle Site is shown in Sheet MRP-5 (Appendix B).

4.2.4 ACCESSORY FACILITIES

Existing on-site facilities that are accessory to the quarry include an office, truck scales and scale house, equipment maintenance area, material storage areas, equipment storage, stormwater drainage facilities, springs and water storage tanks, the main haul road and quarry access roads. Locations of these facilities are shown on Sheets MRP-4, -5 and -6 (Appendix B). All existing accessory facilities will remain and continue to be utilized by the operation. New accessory facilities include the installation of two (2) 500-gallon fuel tanks at the Scale Site and two (2) additional sediment basins.

4.3 FACILITY EQUIPMENT

A current list of equipment in use at Blue Ridge Rock Quarry is provided in Table 7. The portable processing equipment is newly purchased and state of the art. The mobile equipment continues to be upgraded, with older models being replaced with newer units with higher tier engines. The applicant does not anticipate that there will be an increase in the amount of equipment currently used for quarrying. The exception would be the use of additional conveyors as the working face of the quarry moves north and east to transport the material from the face of the quarry to the processing area. As existing equipment wears out, it will be replaced with newer, more efficient equipment.

TABLE 7. FACILITY EQUIPMENT LIST

YEAR	MAKE/MODEL	USE
2004	FORD F-250	SERVICE TRUCK
2015	KENWORTH WATER TRUCK	DUST CONTROL
2012	CAT 740B ROCK TRUCK	EXTRACTION
2003	CAT 988G FRONT-END LOADER	PROCESSING
2003	CAT 988G FRONT-END LOADER	EXTRACTION/ PROCESS
1995	CAT 988F FRONT-END LOADER	LOAD-OUT
1974	CAT 14G MOTOR GRADER	ROAD MAINTENANCE
1990	CAT D-10N DOZER	EXTRACTION
1991	CAT D-9N DOZER	EXTRACTION
2008	POWERSCREEN CHIEFTAN 2100X 2-DEC	PROCESS/RECYCLE
2004	MGL 7436 M95 CONVEY/STACKER	PROCESS
2014	POWERSCREEN CHIEFTAIN 2100X 3-DECK	PROCESS
2014	POWERSCREEN WARRIOR 1800 SCALPING	PROCESS
2014	MGL 7436 M95 CONVEY/STACKER	PROCESS/RECYCLE
2014	MGL 7436 M95 CONVEY/STACKER	PROCESS
2015	POWERSCREEN PREMIERTRAK JAW CRUSHER	PROCESS/RECYCLE
2014	POWERSCREEN MATRAK 1300 CONE CRUSHER	PROCESS/RECYCLE
2015	CAT 349F EXCAVATOR	PROCESS/RECYCLE

4.4 MINING PLAN

As shown on the Quarry Grading Plan (Sheet MRP-7, Appendix B) quarry expansion will occur in a single phase. The upper slopes of the quarry will be excavated to the north and west along the ridgeline, and the quarry floor will be lowered and expanded further to the north. All benches will be out-sloped to drain towards the quarry floor, and water will infiltrate into fractured rock. The limits of the proposed quarry expansion as shown in Sheet MRP-7 will increase the footprint of the quarry by approximately 15.5 acres over the 30-year permit term. Exhibit 4 in Appendix A shows the existing and proposed areas of disturbance at the quarry.

The requested extraction volume is 6,000,000 CY, at a maximum rate of 200,000 CY per year over a 30-year period. The proposed mining plan area contains about 7,641,500 CY of material.

The limits of the quarry will be extended primarily to the north and west. The west limits of the quarry will be bound by the existing access road west of the quarry on the southerly edge of the quarry and traverse away from the existing road as the mining progresses northward. The east edge of the quarry will be set back 50 feet west from the west edge of the existing unnamed tributary that runs along the east flank of the mine. The ridge to the north is undeveloped land primarily in the McCutchan ownership. Further to the north is the north access road that provides access from the quarry floor to the upper ridge and upper slopes of the quarry.

4.4.1 DESCRIPTION OF MINING PROCESS

In areas of the quarry that have not been disturbed by current mining activities, vegetation and topsoil will be removed in the immediate working areas in preparation for aggregate extraction. *Topsoil will not be removed more than one year in advance of mining in a new area of the quarry.* Topsoil and overburden will be stockpiled in areas identified on Sheets MRP-5 and MRP-7 (Appendix B). Overburden will be salvaged for future reclamation with some available to customers as a saleable product. A dozer and loader will be used to remove loose aggregate and transfer it to the processing plant for sorting and screening by particle size. Riprap will be removed and stockpiled using an excavator without further processing. If areas of unfractured bedrock are encountered the rock will be blasted to fracture and loosen the rock for removal with a dozer. It is anticipated that blasting would be conducted not more frequently than four (4) times per year.

4.4.2 QUARRY FLOOR EXPANSION

The floor of the quarry will be lowered approximately 30 feet and expanded approximately 630 feet further north than the existing floor. The final mine configuration will result in a crescent shaped floor area with a depression for processing and stormwater retention and infiltration. The overall configuration of the quarry is shown on Sheet MRP-7 (Appendix B). All mining will take place in a top-down process where the upper benches are reclaimed as the mining is completed from the upper bench moving towards the floor.

The quarry area has been graded to direct water towards three basin areas. Two of these basins are on the quarry floor, one to the south and one to the north. The third basin is an existing basin that will continue to be used for stormwater and for water storage use for processing. More discussion on these basins is included in Section 4.5. All areas on the quarry floor will be sloped towards the basins at a minimum 2-5% slope to provide positive flow towards the basin areas. The southerly edge of the quarry will retain a minimum 3-foot berm to ensure that water does not leave the quarry floor. The berm will remain in approximately the same location where it is currently located. The existing pond to the south will remain and be used as a holding basin for excess water storage for use during the summer months, as it currently is used. The quarry floor will retain the 100-yr, 24-hr storm event; no overflow is anticipated.

4.4.3 SLOPE EXCAVATION

Excavation of the upper slopes will extend to near the top of Buck Mountain at elev. 1,800 feet. Mining includes initial blasting of the rock and then removal with a dozer and loader. The beginning of the cut limits on the ridge will be approximately 700 feet north of the existing ridge tip, near the saddle of the ridge. The typical slope configuration is shown on Sheet MRP-7 (Appendix B) and cross-sections showing the cut faces are included on Sheet MRP-9. The quarry face is designed with 25-foot wide benches with 50-foot vertical cuts typically cut at a slope of 0.75H:1V (0.75-foot horizontal extensions for every one

foot of vertical drop) between the benches. This grading configuration (including benches) will result in a 1.25H:1V overall slope and is consistent with the recommendations in the Geotechnical Report (see Vol. 2). The highest slope will be 525 feet, beginning at an elevation of 1,775 feet at the top of the ridge, to the north edge of the quarry floor elevation, at an elevation of 1,250 feet. The upper limits of the quarry and areas east and west of the quarry face will have less steep slopes of 1.5V:1H to account for the less competent rock along the edges of the excavation. A discussion of the quality of rock encountered within the quarry and geologic conditions is included in the Geotechnical Report.

As the working face of the quarry moves north and east, conveyors will be added to transport the material from the face of the quarry to the processing area. Access roads for haul trucks will remain in the same general location.

4.4.4 MINE WASTE MANAGEMENT

At this time waste (hazardous or non-hazardous) is not being stored at Blue Ridge Rock Quarry. This project does not include the installation of tanks or facilities that would be used to store waste. See Appendix D for the current Storm Water Pollution Prevention Plan.

Overburden will be removed to access rock for mining and will be sold to customers and stored onsite for reclamation. Overburden will be stored in a number of locations identified on Sheets MRP-7 and MRP-7 (Appendix B). None of these locations will restrict natural drainage. Fill slopes will be no steeper than 2H:1V, seeded and mulched after disturbance prior to the wet weather to minimize water and wind erosion. Supplemental BMPs such as silt fence, wattles, or use of HDPE sheeting may be implemented if needed to prevent erosion of stockpiled soil. The soil storage areas are included in the facility's SWPPP and subject to the requirements of the State Water Quality Control Board's (SWQCB) Industrial General Permit (IGP). The configuration of the stored overburden is specified on Sheet MRP-11, Detail 7. The salvage and storage of soil for reclamation use is discussed in greater detail in Section 5.10.

4.4.5 MINE RESERVES

It is unknown at this time whether additional mine reserves exist once this mining plan has been completed. There may be rock to the north of the proposed mine boundary, however no investigation has been performed beyond the Project limits. This Mining and Reclamation Plan will not prohibit mining of potential reserves in the future.

4.5 PROCESSING AND PRODUCT STORAGE

On-site processing activities will include the processing of virgin rock that is extracted from the quarry and recycled materials that are imported. Extracted rock will be crushed, conveyed, and screened into an assortment of types and grades of aggregate products. Rock processing typically begins with the transfer of excavated or recycled material to the crusher. Large sized rock, usually larger than six inches, is separated by size using an excavator. The remaining rock is transported to a jaw crusher where it is crushed. After crushing, the rock is conveyed to a series of screens where it is separated by size and then conveyed to separate stockpiles according to size specifications. Equipment is mobile and will be moved within the quarry floor as mining proceeds and the floor expands.

The majority of finished product will be stored in stockpiles at the Quarry Site. Finished product will also be stockpiled at the Scale Site for use in topping off trucks on the scales. Process fines, a by-product of aggregate processing activities, will either be stored at the Quarry Site or blended with topsoil and overburden for use in reclamation and revegetation activities.

4.5.1 MATERIAL RECYCLING

Reclaimed concrete and asphalt will be recycled at the quarry. Materials imported for recycling will be stockpiled in the Recycle Site until ready for crushing. Recycled material may be made into recycled asphalt or crushed concrete for slurry, or as an alternative base material that is composed entirely of reclaimed asphalt or concrete. Once processed, finished recycled products will be moved to either the Scale Site or the Quarry Site. It is estimated that up to 40,000 CY (40,000 tons) per year would be imported, becoming approximately 30,769 CY once processed.

4.5.2 IMPORTED SOIL

Up to 10,000 CY of soil will be received annually at the facility. Soil will be stored in the soil storage area at the Scale Site and sold to customers as clean fill dirt.

4.6 DRAINAGE AND EROSION CONTROL

Surface mining and reclamation activities will be conducted to protect on-site and downstream beneficial uses of water. A combination of site design and stormwater drainage features have been incorporated at the site to reduce erosion and sedimentation and to minimize off-site discharges of impaired stormwater from the facility. The following summarizes the drainage patterns and stormwater features utilized at the Project site. Refer to the Erosion Control Plans in Appendix C, the Drainage Analysis in Appendix E and the current SWPPP in Appendix H for additional information.

Quarry Site (Sheet EC-4): The quarry has been designed to contain all on-site run-off within its limits for up to a 100-yr, 24-hr storm event. This is accomplished with 3 sediment basins, including one existing sediment detention basin at the south end of the quarry near the quarry entrance, and 2 proposed sediment infiltration basins within the quarry floor.

The majority of the drainage at the quarry flows toward the north sediment basin (SWP-18), including all of the rock slope-benches. About 75% of the total quarry area drains into this basin. No infiltration rate data was available, however anecdotal evidence indicates a high rate of infiltration into the fractured sandstone. The floor provides sufficient capacity to contain a minimum of one foot of sediment as well as the water from a 100-yr, 24-hr storm event, assuming zero infiltration and one foot of minimum freeboard.

A grade break exists between the north and south sides of the quarry floor running east to west between water tanks on the east limits of the quarry and a power pole on the west limits of the quarry. This divides the drainage between the sediment infiltration basin mentioned above (SWP-18) and another sediment detention basin (SWP-17) located in the southwest corner of the quarry. It is assumed that after the quarry floor is lowered, this basin may be located within clay material and infiltration rate may be poor. Assuming zero infiltration, SWP-17 has been designed to contain a 100-yr, 24-hr storm event with the bottom foot available for sediment storage and a minimum one foot of

freeboard. Water in the southern part of the quarry will sheet flow down the slopes to the quarry floor and flow to the sediment basin.

The rip-rap and soil storage areas located at the southeast corner of the quarry above the quarry floor will be captured by the existing sediment detention basin designated as SWP-16. This basin, similar to the others, has been designed to hold a 100-yr, 24-hr storm event with one foot of sediment storage.

Haul Road Between Sites (Sheets EC-3 and EC-4): The haul road immediately preceding the entrance to the quarry is out-sloped toward a series of rock sheet flow filters. The sheet flow filters were designed to disperse and slow the velocity of concentrated flows in road ditches through a series of rock-covered cut outs in the road where sheet flow is dispersed into the surrounding grassy slopes. In addition to the sheet flow filters, rock-lined ditches, gravel check-dams, gravel berms and earthen berms provide erosion control along both sides of the haul road.

Recycle Site (Sheet EC-3): The Recycle Site slopes gently to the south toward a designated infiltration area (SWP-8.1). Run-off from the Recycle Site is prevented by earthen berms along the perimeter of the site.

Scale Site (Sheet EC-2): The Scale Site has been graded to drain to a large sediment infiltration basin (SWP-6) within the Scale Site floor. The basin has been designed to hold a 25-year, 24-hr storm event. For larger events, an earthen berm has been constructed around the Scale Site to prevent run-off from flowing over the edge of the site. This berm allows for the containment of a 100-year, 24-hr storm event by allowing the flooding of a small section of the Scale Site floor, while maintaining a minimum one foot of freeboard below the low point of the berm.

Haul Road from Entrance to Scale Site (Sheet EC-2): The upper portion of the haul road below the Scale Site and adjacent to the topsoil storage area drains into a rock-lined ditch. The ditch flows to a culvert that conveys the water under the haul road to a rock filtration basin located in the soil storage area, allowing the sediment to drop out of suspension. A berm along the west side of the soil storage area prevents run-off from the soil storage area.

Below the soil storage area, the haul road contains an earthen berm with check-dams along the north side and a gravel berm on the south side. The haul road is graded to slope toward the earthen berm and check-dams. Approximately half way down this section of road is a sheet flow filter that serves to disperse concentrated flow into sheet flow down the slope below. Water along this section of haul road collects in a sediment infiltration basin (SWP-4). The basin has been designed to contain a 100-yr, 24-hr storm event, while providing one foot for sediment storage and a minimum one foot of freeboard.

The bottom 800' section of the haul road is paved and drains to a series of rock filtration basins (SWP-1 – SWP-3) before flowing under Geysers Road through a culvert to the Russian River.

Outlets from sediment basins are armored with rock to prevent erosion.

4.7 MAINTENANCE / GOOD HOUSEKEEPING PRACTICES

An integral part of the mining operation is the routine maintenance of drainage and sediment facilities and roads. Culverts, road ditches and structural stormwater facilities (sediment basins and sheet flow filters) are inspected after each storm and cleaned out as needed to maintain function. An excavator is used to clean out sediment basins when increased capacity or infiltration is needed. Removed sediment is treated as overburden and may be stored on the quarry floor, in one of the soil storage areas or sold. A road grader is used monthly to smooth the haul road and unpaved internal roads so they can be safely and easily traversed by haul trucks and so runoff does not erode the travel surface. The site is checked regularly for leaks and spills from equipment. Weeds around the perimeter of the site will be trimmed to reduce fire hazards and in preparation for future reclamation.

4.8 FACILITY ACCESS AND PUBLIC SAFETY

Public exposure to the site will be minimal as the project is located behind locked gates and is difficult to access given the mountainous terrain that surrounds it. Since there is no exposure to the public, fencing is not required.

There will be no portals, shafts, tunnels or other surface openings that need to be protected from public entry or closed upon reclamation.

4.9 OPERATING SCHEDULE AND WORK FORCE

Activities involved in the operation of Blue Ridge Rock Quarry include the extraction and processing of native aggregate, processing of recycle material, transferring materials, loading and unloading of trucks, receiving customers and weighing loads at the scale house, road maintenance, application of dust suppressant, monitoring and maintenance of stormwater structures, equipment maintenance and repair, and general housekeeping. The facility's operating schedule is dependent on the season, weather and demand for product. The peak season is June through October, when the weather is dry, the construction season is at its peak, and demand for rock products is highest. November through May constitutes the off-season. Operations cease on rainy days.

The facility is currently permitted to operate within the hours of 7:00 am and 6:00 pm, Monday through Saturday. Actual operating hours have varied throughout the 20 years in operation. The proposed operating schedule includes no change to the daytime hours, and adds 45 nights per year to allow the operator to complete large jobs within limited time frames if needed. Nighttime work hours were not requested or granted under the original use permit. Nighttime operations would include haul-out only; extraction and processing would not be conducted during nighttime hours. The operation would continue to be closed during periods of heavy rain.

Based on an extraction rate of 446,000 tons per year and a production rate of 625 tons per day (TPD), extraction of aggregate would require 89 working days. The maximum time it would take to process 180,000 cubic yards of native rock (including the sorting of riprap) and 40,000 cubic yards of recycled aggregate would be 198 working days if each of these activities were conducted on separate days. The processing of this material could be conducted in 103 days if all processing activities were conducted simultaneously. Extraction and processing will frequently be conducted simultaneously; the exception would be processing the recycled material, which would not be conducted when the main plant is

running. If extraction and processing of native rock were to be conducted separately, the maximum number of operating days required would be 287 days (89 days of extraction + 198 days of processing).

The reality of quarry operations at Blue Ridge involves mining and processing being conducted at the same time and a large portion of time spent loading customers and maintaining the facility.

Blue Ridge Rock Quarry currently employs three (3) employees to run the quarry operation. The Project when operating at the maximum production rate could employ up to ten (10) employees.

5 RECLAMATION PLAN

The quarry will be reclaimed to establish an end use of open space, consistent with the surrounding land use. A total of 37.54 acres will be reclaimed including most of the Quarry Site, soil storage areas, Recycle Site and about half of the Scale Site. Approximately 20.77 acres, including access roads, will remain for ranch use and will not be reclaimed. The mine boundary extends approximately 50' beyond the active working areas. The perimeter of the site and the upper wall areas are designed to provide an adequate factor of safety for the end use of open space. The reclaimed areas, as shown on Sheets MRP-9 and MRP-10 (Appendix B), will be covered with topsoil, seeded and/or planted with container stock, and mulched in accordance with the specifications described in the following sections. Most of the sediment basins will be cleaned of sediment and retained for use as stock ponds for livestock. Others will be filled, compacted, graded and vegetated to grasslands.

5.1 RESPONSIBLE PARTIES

The sole responsible party for reclamation of the quarry, from topsoil stockpiling to monitoring, will be Syar Industries, Inc. A signed acknowledgment of this responsibility is included in Section 7.

5.2 SUBSEQUENT USE AND IMPACT ON FUTURE MINING

The end use of the mine will be open space, consistent with the existing uses of the ranch on which the quarry is located. Open space consists of natural areas representative of the undisturbed land around the quarry and will consist of native grasslands and oak woodland. The reclamation plan does not include any permanent development that would preclude future mining after reclamation has been completed.

5.3 RECLAMATION SCHEDULE

Reclamation will be performed as soon as final slope configurations have been constructed in accordance with Sheets MRP 9-12 (Appendix B). The top quarry bench will be the first area to be reclaimed and will commence when the limits of the quarry floor have been reached and final configuration of the upper slopes have been achieved. The timing of reclamation depends on the production rate of the quarry and whether maximum production rates are sustained throughout the permit term. Quarry production is dependent on the market, and it is impossible to know when final mine configuration will be achieved. However, when reclamation begins it will be performed first on the quarry benches starting from the top down.

5.4 RECLAMATION STANDARDS AND GOALS

The primary intent of the reclamation plan for Blue Ridge Rock Quarry is to achieve an end use of open space. The goals of reclamation are to stabilize site slopes and soils, replace oak trees at a ratio of 2:1, restore some of the previously existing ecological functions, and to visually blend quarry benches with the surrounding landscape. The reclamation plan was designed in conformance with the standards set forth in pertinent sections of SMARA and the CCR.

5.5 STRUCTURE AND EQUIPMENT REMOVAL

The equipment identified in Table 7 will be disassembled by a mechanic and will require the use of a loader and lowboy. All pieces of equipment will be transported offsite with a lowboy and delivered to one of the operators other facilities or sold as salvage (salvage value is not considered in the financial assurance cost estimate). The buildings on the site (scale shack and office) and the fuel tanks will be removed. The storage containers will remain for ranch storage. The scale, which is located adjacent to the haul road, will be removed, filled, compacted and rocked for continued vehicle access to the ranch. The concrete blocks used to create bunkers for product storage will be removed, except for a few that may be used for ranch use (feed storage).

5.6 FINAL SLOPES

The final slopes are comprised of cut slope faces sloping at 0.75H:1V, with 25-foot wide on-slope benches at 50-ft vertical intervals. The overall slope gradient for this configuration is 1.25H:1V and is consistent with the requirements specified in the Geotechnical Report (Vol. 2). The upper 25 feet of the quarry cut faces are sloped back at a 1.5H:1V slope to account for less competent rock. Benches are sloped 2% away from the vertical cut faces.

The geotechnical investigation identified two areas of highly weathered material which was not competent enough to hold the 1.25:1 (H:V) overall slope gradient; the southeast area of the quarry and a section of the western edge of the quarry. These areas are laid back at a continuous 2:1 (H:V) slope. Also, slopes above the quarry equipment access road along the east edge of the quarry are sloped at 2:1 (H:V).

The highest slope will be approximately 520 feet, beginning at an elevation of 1,770 feet at the top of the ridge, to the north edge of the quarry floor at an elevation of 1,250 feet. Based on the varying slope failure assumptions analyzed, the static Factor of Safety has a range of 2.01-2.94 and the dynamic Factor of Safety ranges between 1.62-1.81²³, which are considered adequate for end use as open space and to conform to the surrounding topography. Geotechnical review of the final cut faces is required to make sure that the slopes are graded to meet the criteria set forth in this MRP.

The final slope layout is provided on sheets MRP-7 and MRP-10 (Appendix B). Additionally, a typical slope configuration is provided on Sheet MRP-7 and sections showing the cut slope faces are included on Sheet MRP-8.

5.7 FINAL DRAINAGE

Final drainage at the quarry will be through sheet flow down the quarry cut slopes and benches to the quarry floor, where water will be collected in basins that will remain for ranch use, and allowed to infiltrate into the underlying fractured rock. Benches will contain a 15-foot wide topsoil area for planting, which will be protected from erosion with rock riprap at the front of each bench area. This will break the flow down the quarry face and stop the formation of concentrated flow areas. Topsoil storage areas will be re-graded to allow for sheet flow into the surrounding areas.

²³ (Crawford & Associates 2016)

The quarry floor will contain two sediment infiltration basins, designated SWP-18 in the north part of the floor and SWP-17 in the south part of the floor. A high point located in the south half of the quarry floor and running west-east provides a drainage break between the two basins. Additionally, the storage area located above the south edge of the quarry floor will drain to a detention basin designated as SWP-16.

The haul road from the quarry to Geysers Road will be re-graded to out-slope and allow runoff to sheet flow to surrounding grassy fields. Berms, check dams, and other linear storm water features will be removed. Culverts and sheet flow filters will remain for ranch use. Sheet flow from the road between the quarry and the Scale Site will flow into natural channels, which all eventually flow into Ash Creek, located to the south of the site. Sheet flow from the road between the Scale Site and the entrance off of Geysers Road will flow into an unnamed tributary. Both Ash Creek and this unnamed tributary flow into the Russian River, located west of the site entrance.

The berms surrounding the Recycle Site and soil storage area next to Scale Site area will be removed and the areas will be re-graded to allow for sheet flow to the surrounding grassy areas. The rock filtration basin at the soil storage area will remain and serve as an energy dissipater for the culvert. Drainage at the scale site will continue to be toward the sediment infiltration basin (SWP-6), which will remain for ranch use. Drainage at the entrance at Geysers Road will continue to flow through the rock filtration basins (SWP-1, 2, 3), which outlet to a culvert under Geysers Road and into the Russian River. The berms creating the sediment infiltration basin (SWP-4) at the beginning of the haul road will be removed and the area will be re-graded to allow for sheet flow into the unnamed tributary just to the north.

5.8 PROTECTION OF FISH AND WILDLIFE HABITAT

The protection of fish and wildlife is discussed in detail in Section 3.7.

5.9 RECLAMATION BY MINE AREA

The total area to be reclaimed under this MRP is 37.54 acres. The following sections describe how each area will be reclaimed.

5.9.1 QUARRY SITE RECLAMATION

Reclamation of the Quarry Site is shown on Sheet MRP-10 (Appendix B). The reclamation goal at the Quarry Site is to restore a mosaic of self-sustaining native oak woodland, native grasslands, and over time, to provide vegetative screening of the finished benches to create a more natural appearance that blends with the surrounding property. Reclamation will provide native grasses on the quarry floor and lower quarry slopes and oak woodland habitat on the quarry benches and upper quarry slopes. Reclamation of these areas will be accomplished as described in 5.11.2 (Grassland) and 5.11.3 (Oak Woodland). A summary of reclamation activities at the Quarry Site is provided below in Table 8.

TABLE 8. RECLAMATION ACTIVITIES AT QUARRY SITE

AREA	ACRES	RECLAMATION ACTIVITIES	RECLAMATION PLANTING
Quarry Floor (incl. Processing Area) and Lower Storage Areas	12.84	Remove equipment and stockpiles; water tanks and appurtenant water lines to remain for ranch use. Scarify or over-blast floor of quarry and benches for planting; spread and compact topsoil, seed and mulch.	Grassland
Quarry Benches	5.44	Remove equipment and stockpiles; water tanks and appurtenant water lines to remain for ranch use. Scarify or over-blast floor of quarry and benches for planting; spread soil and compact to 85%; seed and mulch.	Oak Woodland
Upper Soil Storage Areas	1.00	Relocate soil not needed for reclamation of these areas; re-grade areas to sheet flow to surrounding areas; spread and compact topsoil, seed and mulch.	Oak Woodland
Upper Slopes (1.5:1 to 2:1)	2.58	Spread and compact topsoil, seed and mulch	Oak Woodland
Lower Storage Areas	1.57	Remove berm and stockpiled material; re-grade area to sheet flow to surrounding areas; spread and compact topsoil, seed and mulch.	Grassland
Lower Slopes (<1.5:1)	8.23	Spread and compact topsoil, seed and mulch.	Grassland
RECLAIMED AREAS	31.67		
AREAS NOT RECLAIMED			
Rock Slopes (>1.5:1)	8.99	No reclamation, grade per MRP	N/A
Ranch Area and Sediment Basins SWP-16, 17 And 18	1.8	No reclamation; these areas to remain for ranch use.	N/A
NON-RECLAIMED AREAS	10.79		

Of the 31.67 acres of reclaimed area at the Quarry Site, 22.65 acres (72 percent) will be reclaimed as grassland and 9.02 acres (28 percent) will be reclaimed as oak woodland. Just under 9 acres will consist of rock slopes greater than 1.5H:1V that will not be reclaimed. The three sediment basins comprising less than one acre will be cleaned of sediment and left for ranch use.

Final quarry configuration will consist of a series of benches and finished slopes as described in Section 5.6. Reclamation of final benches will involve ripping bench surfaces if compacted, placement of salvaged topsoil to a depth of 18 to 24 inches on bench surfaces, and planting per the specifications described in Section 5.11.3.

Reclamation of the processing area on the quarry floor involves the removal of processing equipment, ripping the compacted ground surface, grading to achieve a smooth surface with positive drainage, adding a six inch layer of topsoil, and hydroseeding for erosion control. Fencing will be installed to keep people and livestock from entering into the quarry pit.

The existing road through the site and to the first bench will be left intact for ranch purposes as shown on MRP Sheet 8. Where aggregate base rock road surfacing is present outside of the roadway to remain, it shall be removed and either reclaimed as saleable product or hauled off.

5.9.2 SCALE SITE RECLAMATION

The Scale Site consists of 5.61 acres, of which 3.2 acres will be reclaimed as open space. The remaining 2.41 acres consist of compacted surfaces that will be used for ranch storage and will not be reclaimed. One sediment basin (SWP-6) will remain to provide a water source for livestock, and the other sediment basin (SWP-5) will be graded and hydroseeded for range use.

TABLE 9. RECLAMATION ACTIVITIES AT SCALE SITE

AREA	ACRES	RECLAMATION ACTIVITIES	RECLAMATION PLANTING
Portion of Scale Site and Sediment Basin SWP-6	2.21	Remove buildings, equipment, gas tanks concrete slab, stockpiles, and concrete storage bins. Remaining water tanks (#5-8) to remain for ranch purposes. Areas to be planted shall be scarified; spread and compact topsoil, seed and mulch	Grassland
Soil Storage Areas & Sediment Basin SWP-5	0.98	Remove berm; rock filter (SWP-5) to remain as a energy dissipator for (e) culvert. Re-grade area to sheet flow to surrounding areas; spread and compact topsoil, seed and mulch	Grassland
RECLAIMED AREAS	3.19		
AREAS NOT RECLAIMED			
Portion of Scale Site and Sediment Basin SWP-6	2.42	No reclamation. SWP-6 to remain for watering cattle. Portion of site to remain for ranch maintenance shall remain as is (with base rock).	N/A
NON-RECLAIMED AREAS	2.42		

Reclamation of the Scale Site involves the removal of the scale house, office, truck scales, fuel tanks and concrete pad; ripping the compacted ground surface, grading to achieve a smooth surface with positive drainage, adding a six inch layer of topsoil, and hydroseeding with a native grass mix specified in Section 5.11.2. Fencing will be installed to keep people and livestock from entering into the hydroseeded areas until vegetation is established and success criteria have been achieved. All areas will be monitored and maintained as described in Section 5.12 and 5.13.

5.9.3 RECYCLE SITE RECLAMATION

The Recycle Site consists of 1.89 acres, all of which will be reclaimed as open space. The berms and any remaining stockpiled material will be removed and the compacted surface will be scarified and re-graded to sheet flow to surrounding grassy areas. A minimum of six inches of topsoil will be spread, and the area will be hydroseeded with the native grass mix specified in Section 5.11.2 Fencing will be installed to prevent access by livestock until vegetation is established and success criteria have been achieved. The area will be monitored and maintained consistent with Sections 5.12 and 5.13.

5.9.4 RECLAMATION OF ROADS AND STORMWATER FACILITIES

The main haul road from Geysers Road to the quarry also provides access to the ranching operation and will remain. The sheet flow filters that were installed along the haul road to provide exit points for surface runoff without concentrating flows will also remain to continue providing sediment control. Stormwater basins # SWP-1, SWP-2, SWP-3 and SWP-4.1 are located near the site entrance and will continue to provide sediment control for the ranch. These basins will not be reclaimed. SWP-4 is an infiltration basin that will be reclaimed as grasslands, consistent with Section 5.11.2 of the Reclamation Plan.

5.10 PRE-RECLAMATION ACTIVITIES

5.10.1 TOPSOIL STOCKPILING AND SALVAGING²⁴

Multiple locations for the storage of topsoil are shown on Sheets MRP-5 and MRP-7 (Appendix B). Topsoil will be salvaged from the excavation areas and relocated to designated stockpile areas. Topsoil will be harvested when dry, to 18 inches in depth. Topsoil is thin in the general area of the quarry, and topsoil may be supplemented with overburden and sediments from pond cleanout. Where deep fills are required, excessively coarse (sandy, gravelly) or fine (clayey) materials should be placed deep in the fill process, well below the root zone. Topsoil and other growth mediums to be used for reclamation will be stored separately from overburden and other rock products and not incorporated into topsoil.

The temporary soil stockpiles will be limited to a 6' depth, shaped with maximum slopes of 3:1, compacted and seeded prior to October 15. All stored topsoil and overburden will be compacted to 85% and track-walked perpendicular to the slope prior to temporary seeding. Topsoil will not be compacted or stabilized to the degree that the topsoil is not maintained as a viable growing medium. Soil storage areas will have signage indicating that the material is to be used for reclamation purposes and are not to be disturbed.

In order to determine the amount of each material type to be stockpiled for reclamation, different mixtures of overburden and process fines will be evaluated as growth media in test plots.

Overburden that is excavated in excess of the volume needed for reclamation may be used for ranch road base, as fill for access roads or processed into saleable products. Sediment from stormwater basin maintenance may be processed or blended into saleable products or used as an additive to the topsoil depending on gradation, if needed to improve the soil texture of rocky soils.

As noted on Sheet ECP-2, topsoil stockpiles will be stabilized by vegetation with the application of seed and straw mulch to protect against erosion from wind and water. Non-active bulk soil stockpiles that are not yet covered with vegetation will be covered during the rainy season.

5.10.2 SUBSURFACE PREPARATION AND RESOILING

All areas to be reclaimed with vegetation will be over-blasted, ripped or scarified to a minimum depth of 6 inches. Hard rock surfaces may be over-blasted in lieu of ripping. Salvaged topsoil will be analyzed for

²⁴ (California Geological Survey 2003)

nutrients to determine if amendments are needed. Soils will be analyzed for macronutrients, micronutrients, pH, cation exchange capacity (CEC), electrical conductivity (EC), sodium adsorption ratio (SAR) and texture.

Upon reclamation, revegetation areas will be covered with soil to depths listed in Table 10. Topsoil will be placed, compacted to 85% and track-walked perpendicular to the slope prior to seeding.

TABLE 10. SOIL THICKNESS FOR PLANTING

Location	Trees	Shrubs	Grasses
Benches	18-24"	18" min	6" min
Quarry Floor	N/A	N/A	6" min
1.5:1 Cut Slope	12"-24"	12"-24"	6" min
>1.5:1 Rock Slope	0	0	0

5.10.3 WEED CONTROL

Control of invasive weeds will be part of ongoing maintenance activities throughout the life of the quarry operation. Reducing weeds around future revegetation areas will provide the greatest chance for native species to succeed and will make weed control more manageable at reclamation time. Where weeds are invasive around the perimeter of working areas they will be removed by mowing or trimming before seed heads develop in the spring. Herbicides may be used in lieu of or in conjunction with manual removal.

5.10.4 TEST PLOT AREAS

Test plots conducted simultaneously with mining will be used to ensure successful implementation of the proposed revegetation program. Test plots will be performed within 10 years of final reclamation to allow for planting, monitoring and adjustments in the revegetation plan and procurement of plant materials should they be changed from those originally specified.

Test plots will be established on the quarry property to determine the viability and survival rate of the selected grasses, herbaceous plants, trees and shrubs. Monitoring and recording will be performed in accordance with the monitoring section of this plan. Data and observations will be used to further refine and guide the revegetation program. Success of the revegetation program will be evaluated based on the success criteria described in Section 5.13.1.

There will be one test plot for each plant community at a minimum, and test plot locations will represent as many final site conditions as possible. *Both container plants and acorns/seeds of the oak trees and shrubs will be planted in the test plots to determine the best method for establishing these species on site. Experimental planting in test plots will follow the detailed planting and maintenance instructions for both acorns and container plants as described in Section 5.11.2.*

Salvaged topsoil and overburden that will be used for final reclamation will also be used in the test plots. The operator will experiment with *different mixtures of overburden, process fines and pond fines to determine the ratio that will support the highest revegetation success rates. The results will inform the*

operator how much of each material to store for reclamation and when/whether overburden and fines may be removed from the site or used for purposes other than reclamation. Test plots may also be used to evaluate compost, wood chips or other organic or rock mulch for weed control and moisture retention.

The test plot area consists of 0.72 acres and is located at the top (north) of the quarry and encompasses the top bench and upper slope as shown on Sheet MRP-10 (Appendix B). The test plot location will provide site conditions representative of quarry benches and finished slopes, and is located downgradient from a spring that will provide gravity-fed water for irrigation until plants are established. Mining in this area will occur early in the permit term and will therefore be available for planting sooner than other areas of the quarry.

This bench is approximately 345 feet long and 25 feet wide and comprises 8,855 square feet. The upper slope consists of 22,709 square feet with an irregular shape averaging 275 long by 95 wide. Both areas will be able to accommodate a number of test plots of various sizes and shapes.

The test plots will be observed for a period of two years to ascertain if the seed mix (grassland) and planting materials (oak woodland) will meet the reclamation standards described in detail on the following pages. If, at any time during this period, the test plot does not appear to be viable, measures will be taken to adjust the seed mixture, planting methods, mulching, or protection, until the test plot is able to meet the required standards.

5.11 REVEGETATION

The revegetation program provides for vegetative cover suitable for an end use of open space and capable of self-regeneration without continued dependence on cultural practices such as irrigation, soil amendments or fertilizer. The revegetation component of the reclamation plan will consist of two plant communities: Oak Woodland and Grassland. These plant communities were selected for multiple reasons: (1) they represent the predominant vegetation types surrounding the quarry operation; (2) they will restore wildlife habitat and ecological functions that were removed in areas disturbed by mining; (3) they will replace vegetation that was removed for mining purposes with the same or similar species with the expectation that site conditions will be favorable for successful growth; and (4) they should be able to meet success criteria without requiring significant remedial action. In conformance with the Oak Woodlands Conservation Act oak trees will be planted at a 2:1 ratio to replace the trees removed.

The plant materials associated with each community type are listed in Table 12. A more detailed discussion of each community type is included in following sections.

5.11.1 GRASSLAND

Approximately 29.5 acres will be reclaimed with grasslands as shown on Sheets MRP-9 and MRP-10 (Appendix B). These include the quarry floor and lower quarry slopes, lower soil storage areas and rip-rap storage area south of the quarry floor, the Recycle Site, portions of the Scale Site, and sediment infiltration basin #SIB-4.

Grass species observed at the Project site during the biological reconnaissance included primarily annual grasses and a number of invasive species and less predominantly native grasses. A complete plant list is provided in Appendix F.

Site Preparation

Where the final floor surface consists of unfractured bedrock, all compacted surfaces will be scarified or over-blasted to a minimum depth of 6" below finished grade prior to placement of topsoil as described in Section 5.10.2. Topsoil thickness will be placed at a minimum depth of 6 inches. A clean, smooth, weed-free seedbed will be created to the greatest extent feasible. Seed to soil contact is important.

Seed Mix

From the list of native grasses found on site three species were selected for their ability to compete with introduced invasive species more successfully than others²⁵. The following seed mix will be applied at a rate of 34 pounds of pure live seed (PLS) per acre as described in the following section. The high application rate will help achieve a dense cover quickly, which will help crowd out competing undesirable species.

Blue Wild Rye (<i>Elymus glaucus</i>)	33%
CA Meadow Barley (<i>Hordeum brachyantherum</i>)	21%
CA Brome (<i>Bromus carinatus</i>)	25%
Rose or Subterranean clover (<i>Trifolium hirtum</i> or <i>subterraneum</i>)	21%

Seed Application

Seed mix may be applied by either hydroseeding or broadcast method as described below. For both methods, seed should be sown between October 1 and October 15, unless restricted by wind or inclement weather. For optimal germination conditions, hydroseed should be applied to lightly moist soils in the fall, prior to the rainy season and prior to freezing temperatures. Seeded areas will be inaccessible to livestock for two years or until success criteria have been met.

Hydroseed Application Procedure

Erosion control materials will be applied in a one-step application with the hydroseeding equipment. The one-step application will consist of the following:

Seed mix + wood fiber (800 lbs/acre) + Biosol (800 lbs/acre) + non-asphaltic tackifier

Depending on the results of the soil analysis, amendments such as potassium, sulfur, urea, etc. may be added to the above mix. When planting California natives, chemical fertilizers may encourage the growth of non-native species that could out-complete the natives. In general, small doses of non-chemical fertilizers such as well-seasoned compost are preferred for California native plants. Biosol may provide for sufficient slow-release of organic fertilizer without further additives. *Any application of fertilizer or amendments will be performed in a manner to avoid contamination of surface or groundwater.*

Broadcast Seed Application Procedure

The plant species in the broadcast seed mix would be the same as those in the hydroseed mix; however, wood fiber, amendments, and tackifier will not be included in the broadcast seed mix.

²⁵ (USDA NRCS 2016)

Seed will be uniformly broadcast using a hand held rotary seed dispenser or “belly-grinder” type dispenser. The seed will then be raked into the soil surface to a depth of 1/4 inch. Large, flat areas can be seeded with a seed drill or no-till drill. A 1/2-inch layer of weed-free straw mulch (up to 2 tons per acre) will be applied on top of the seedbed to protect seed from foraging birds. The mulch will also protect exposed soil from erosion. The straw should be crimped into the soil with a shovel to secure.

5.11.2 OAK WOODLAND

Oak woodland will be planted on the quarry benches and upper slopes of the quarry as shown on Sheet MRP-10 (Appendix B). Reclamation of these areas will be accomplished by planting woody tree and shrub materials, broadcasting of a native seed mix and control of noxious weeds.

Plant Selection and Layout

Plant selection was guided by the composition of existing plant communities surrounding the quarry, the physical conditions of the site, and the desire to replace oak trees removed due to mining. A complete list of plant species observed on the property is provided in Appendix F. Species selected for reclamation are listed in Table 12. Woody plants will be installed at densities shown in Table 11 in the planting zones shown on Sheet MRP-10 (Appendix B).

TABLE 11. PLANTING DENSITIES

	Oak Trees	Shrubs
Density Goal	30 trees per acre	75 plants per acre
Survival Rate	80%	80%
Planting Density²⁶	36 trees per acre	90 plants per acre
Total Plants Required	325	812

Planting densities are higher than the reference site (reference site = approximately 18 oaks per acre) to provide some screening of the benches and upper slopes to create a more natural looking landscape that blends with the surroundings. At a planting rate of 36 trees per acre, trees will be planted an average of one every 35 feet. Trees and shrubs may be established in small clusters to create a more natural looking landscape, with 3-4 plants per cluster. The area between plantings will be broadcast seeded with a native grass mix. The planting specifications for oak woodland revegetation are provided in Table 12.

TABLE 12. OAK WOODLAND PLANTING SPECIFICATIONS

Layer	Common Name	Botanical Name	% of Layer	Propagule or Container Size	Number of Units
Tree	Blue Oak	Quercus douglasii	10	Direct seed SC/TP	32
	Oregon White Oak	Quercus garryana	20	Direct seed or SC/TP	65
	Canyon Live Oak	Quercus chrysolepsis	20	Direct seed or SC/TP	65
	Interior live oak	Quercus wislizenii	15	Direct seed or SC/TP	49
	Coast live oak	Quercus agrifolia	20	Direct seed or SC/TP	65

²⁶ Includes overplanting by 20 percent

	Black oak	<i>Quercus kelloggii</i>	15	Direct seed or SC/TP	49
Shrub	Manzanita	<i>Arctostaphylos manzanita</i>	10	SC/DP	82
	Chamise	<i>Adenostoma fasciculatum</i>	90	SC/DP	730
Herbaceous	Blue Wild Rye	<i>Elymus glaucus</i>	33	Broadcast Seed Mix 43 PLS/acre x 9.02 ac = 388 PLS total	126 PLS
	CA Brome	<i>Bromus carinatus</i>	25		100 PLS
	CA Meadow Barley	<i>Hordeum brachyantherum</i>	21		81 PLS
	Rose or Subterranean Clover	<i>Trifolium hirtum</i> or <i>Trifolium subterraneum</i>	21		81 PLS

SC = Super Cell

TP = Tree Pot

DP = D-Pot

Procurement of Plant Materials

Reclamation will be accomplished through the planting of native tree and shrub species whose propagules (seed, cuttings, etc.) are collected from on-site oak woodland and shrubland habitats prior to their removal, as well as undisturbed habitats adjacent to the quarry. If a sufficient supply of propagules are not available adjacent to the sites, or the time lapse between plant removal and reclamation is too long, the collection zone will be expanded to similar vegetative communities in the watershed and further expanded to South Interior Mendocino County ecotypes, as needed. The container sizes utilized for planting will include treepots, deepots and/or super cells specifically designed for habitat restoration purposes. Trees of the *Quercus* genus may include acorns and/or container stock as appropriate. Native plant nurseries are generally capable of conducting contract collection and propagation of plant materials. Qualified nurseries should be contacted two years prior to the anticipated planting date. Caution should be taken when utilizing a commercial nursery for growing plant materials grown onsite that they are not exposed to Phytophthora.

Direct Seed

Acorns of *Quercus* species may be planted directly as an alternative to contract growing. Direct seeding of acorns is particularly effective for replacement plantings of dead plants. If this planting method is chosen, it is preferable that acorns and seed material be collected and planted in the same season.

Collection and Storage Method

The following oak regeneration guidelines adapted from *Collection and Care of Acorns - A Practical Guide for Seed Collectors and Nursery Managers*²⁷ should be followed for the harvesting of acorns:

1. Collection of mature acorns directly from limbs produces the highest quality seeds though most acorns are collected from the ground after they have fallen.
2. Collection should begin when acorns start to fall. To minimize pests, acorns can be tapped out of branches using poles and collected on tarps.
3. Of the acorns that fall 5 to 10% are usually insect-infested or diseased and they should be discarded.
4. In species where the cup encases more than half the acorn (black oaks) cup scars on bottom of the acorns should be checked. If the cup scar is dark it should be discarded. Viable acorn scars will be yellow, or lighter than the acorn color.

²⁷ (Bonner 2003)

5. Acorn age can be determined by holding the acorn to the ear and shaking. Acorns that rattle are very dry, in danger of losing viability and should be discarded. The rattle is caused by shrinkage of the cotyledons away from the interior of the pericarp.
6. Seed shall be kept in a cool, shaded place until planted. As little as 5% moisture loss will decrease acorn quality.

Proper seed storage is essential to reduce metabolic activity, so the radical does not emerge. Prior to planting the acorn, survival can be greatly increased through sorting. No more than a few days before scheduled planting, remove the desired quantity of acorns from cold storage and place them in a plastic bucket filled with cold water. Soak the acorns for a few hours. The unhealthy seeds will float, and the solid seeds will sink to the bottom. Discard the floating acorns ("floaters"). Drain the remaining healthy acorns, and dry them on newspaper about 1 hour at room temperature before replacing them in the bags. Place a handful of new peat moss in the bag with them, and store as described above, but this time for no more than a few days.

If the available crop of healthy acorns is inadequate, an alternative soaking method may rehydrate some "floaters" that would otherwise be considered inferior. After the soaking and separation described above, re-soak the "floaters," changing the water every 12 hours. Retrieve the acorns that sink, and continue soaking the remaining "floaters" until no more acorns sink. Drain and store any salvaged acorns as described above. Sometimes even seeds with obvious damage from insects or rodents can be salvaged, but it is important that the apex of the acorn (i.e., the end opposite from the cap) not be damaged.

If oak acorns are not direct-seeded within four weeks following collection, then they may require stratification and pre-germination. If the operator is not the acorn collecting agent, seed delivery should be requested just before installation, and only in amounts that can be planted the same day to prevent heating and desiccation which reduces germination.

Container Plants

Container plants will be propagated from seeds and/or cuttings from the quarry property. Seeds and cuttings will be collected approximately one to two years prior to installation to allow sufficient time for the plants to grow viable roots systems before they are planted. Seeds for the target species are generally collected between late summer and fall. Plants will be grown in super cells, treepot, or deepot containers to encourage deep roots.

A restoration ecologist should inspect the container plants upon delivery and prior to planting to ensure that they are healthy and vigorous. Container plants deemed unsuitable should be returned to the nursery for replacement. Tree health and vigor should be maintained if trees are stored between the time of delivery and planting.

Procurement of Native Seed Mix

Aerial Seed Procurement

The grass seed specified in this plan is commonly available at commercial seed supplies including LeBallister's²⁸ and S&S Seeds²⁹. All seed should be procured from lots originating from the North San Francisco Bay Area region.

Seed Treatment

No treatment is recommended for the grass seed mix prior to being mixed with the hydroseed slurry.

Soil Amendment

Successful reclamation of California natives may include the addition of nitrogen stabilized organic amendment and the judicious use of mycorrhizal inoculants. In general, California native plants should not be fertilized using chemical fertilizers. Surface soil on the upper slope may be amended utilizing fresh topsoil, sediment from stormwater basins (if fines are needed) and organic fertilizers such as mature green waste compost. Backfill placed in individual planting holes may be similarly amended. Soil amendments will be applied based on soil test results.

Biologically active soils help improve revegetation results. Local mycorrhizal fungi will be acquired by harvesting small volumes of soil from the root zones of adjacent plants of the same type as those being planted. The removal of only small volumes of soil from adjacent plants will ensure that these donor plants and their root zones are not disturbed. One cup of the mycorrhizal inoculant will be placed into each planting hole at the time of planting.

Site Preparation

Planting Terrace and Hole

Prior to planting, the area three feet in diameter around each planting site will be scalped of herbaceous vegetation to remove part of the seed bank and reduce weed competition. On slopes, a small back-sloped terrace will be cut into the slope with a pick and the excavated material will form a berm at the face of the terrace. For seedlings, a planting hole 8-inches in width and 16-inches in depth, will be dug in the center of the terrace. For direct-seeded plants, a planting hole 6-inches in width and 10-inches in depth, will be dug in the center of the terrace. This represents minor over-excavation for the purpose of creating a column of decompacted soil that is well mixed between the topsoil and subsoil – any rocks greater than 3-inches in diameter will be removed.

If soil amendments are used, they will be blended with native soil removed from the planting hole. The amended soil backfill will be lightly compacted to remove air spaces between roots and soil.

Plant Installation

Woody plants will be installed after the onset of winter rains when the soil is moist to a depth of at least six inches. This typically occurs by December but may occur as early as November.

²⁸ (LeBallister's Seed 2016)

²⁹ (S&S Seeds 2016)

A survival-enhancing revegetation planting method commonly referred to as “collar and screen” planting will be employed. This method was developed at the University of California, Davis, and proven in the field by Circuit Rider Productions at multiple mine and quarry sites in northern California. This method yields high survival rates on most sites with little or no irrigation³⁰. For direct-seeded plants, low cost tree shelters used with a wood, steel or bamboo stakes can be used.

Direct-Seeded Plants

If the first winter's rainfall totals have been below normal, partial top-pruning of the seedlings may be beneficial³¹. This should be done before summer approaches to decrease transpiration of moisture through the leaves and conserve the limited available ground moisture.

Acorns will be sown as early as possible once autumn rain has fallen and the ground moisture is sufficient³². The tap root must penetrate to levels where moisture will be present the following summer. Acorns will be covered with 1/2 to 1-inch-deep soil. The use of a low-cost tree shelter is recommended, for protection and enhanced growth. If acorn begins to germinate, care should be taken to protect the tender root. The acorn should be planted with the root pointing down. Use a small diameter stick or screwdriver to make a hole for the root³³. Stratified and pre-germinated acorns may be planted up to March 15. Acorn planting holes will be prepared as described above.

Container Plant Installation

A “collar” (i.e., one quart plastic dairy container with bottom cut off) or tree shelter will be placed into the planting hole. The over-excavated planting hole will be partially filled to the approximate depth of the nursery container. The plant will be gently removed from its container in such a manner that the root ball remains intact and is not bent or broken. Plants will be installed immediately after removal from the container. Matted roots on the sides shall be “fluffed” by hand or longitudinally sliced to ¼ inch deep. Matted roots on the bottom of the rootball shall be fluffed only. Trees exhibiting “J-roots” should be discarded.

Seedlings will be placed in the collar so that their root crowns are at or slightly above (up to 0.5 inch) the grade outside the collar. The collar will be backfilled with in-situ soil and amendment and the tree adjusted so that the root crown remains at grade following soil settlement that occurs after initial irrigation. The area outside the collar will be partially backfilled and hand compacted.

The protective screen will be wrapped around the outside of the collar two to three inches below grade forming a cylinder around the collar. A wire will be wrapped around the screen and twisted to hold the screen in place. The remaining backfill will be placed outside the collar and tamped firmly. The lip of the collar should be one-inch above grade and the soil depth inside the collar should match the soil grade outside of the collar.

The top of the screen will be folded over approximately one-inch, essentially enclosing the plant. Manzanita and chamise will be planted with a collar without a screen due to their low spreading growth form.

³⁰ (Bush 1989)

³¹ (McCreary 1993)

³² (D. McCreary 1990)

³³ (California Department of Fish and Game 2010)

Mulch will be placed in planting basins and terraces to a minimum depth of 3-4" for weed suppression and water retention. If organic mulch is used, such as wood bark, it should not be allowed to touch the stem of the plant. Gravel mulch, such as pea gravel, is recommended for drought-tolerant California natives such as those selected for the site.

5.12 POST-RECLAMATION MAINTENANCE

Maintenance of all reclamation areas during the three-year plant establishment period will be the sole responsibility of the quarry owner/operator. Basic maintenance will consist of all work and materials necessary to maintain the reclamation plantings, water source, and general stability of the site during the three-year plant establishment period and subsequent five-year monitoring period accorded to each of the three stages, including the test plot phase.

Included in maintenance activities will be documentation of all maintenance work in a log, to include repair of irrigation systems; repair and maintenance of planting terraces, plants and plant protection hardware; reapplication of mulch; removal of excess seedlings; erosion control; weed removal; and all other tasks necessary to maintain the reclamation areas. Plants will need to be self-sustaining without irrigation for two years prior to release of financial assurances.

5.12.1 IRRIGATION

The Operator, under the direction of a qualified restoration ecologist or similar expert, will monitor the plants to determine the amount and frequency of irrigation required based on experience with the test plots. Typically, in Year 1, the plants will be irrigated with enough regularity (approximately 2-3 times per month), from March through October, to keep the soils within the root zone moist. The irrigation schedule in Year 2 will be based on the water requirements of the plants and is anticipated to be somewhat less (approximately 1-2 times per month). In Year 3, little irrigation (0-1 times per month) will be required. The irrigation schedule will depend on the condition of the plants. Irrigation requirements will be determined through site observations and weather conditions using an adaptive management approach.

Gravity-fed springflow will provide water for drip irrigation. A drip irrigation system will be installed concurrently with planting to ensure new plantings will have immediate access to water. The system will be monitored for leaks and clogs on a regular schedule that will be logged. If needed, a solar-powered pump may be installed in order for water to reach planted areas higher in elevation than the water source. If any areas are to be hand irrigated, such as in remote areas, a dipper will be used to gently pour water into each planting collar where it will be directed to the roots.

5.12.2 WEED CONTROL

Maintenance of revegetated areas will include diligent removal and control of CDFA listed noxious weeds and other undesirable species to reduce competition. Invasive weeds can significantly impede the development of young plantings and may reduce the diversity of plants and the aesthetics of the site. Four species of CDFA listed weeds have been observed in the project area, including Italian thistle (*Carduus pycnocephalus*), yellow star thistle (*Centaurea solstitialis*), tocalote (*Centaurea melitensis*) and medusahead grass (*Elymus caput-medusae*). These species have the potential to diminish available water and light resources from desired establishing plants and can easily outcompete native grasses if not controlled.

Weed removal will be conducted during regular maintenance activities during the monitoring period. Grassland maintenance will consist primarily of monitoring and control of exotic weed species that invade the seeded areas.

Weeds within the reclamation areas will be controlled inside and around each plant collar, as well as within the back-sloped planting terrace. In the terraced oak woodland planting areas weeds will be hand pulled without disturbing seed, seedlings, plants, or their roots before seed heads have set. Weed trimming and mowing, post-emergent herbicide, hand removal, or any combination of these methods may be used to control weeds outside of back-sloped planting terraces as needed. Care will be taken to avoid injuring any volunteer native plants that colonize the gaps between plantings during weeding. Weeding should take place during regularly scheduled irrigation visits since weeds are more easily removed after irrigation has softened the soil. During weeding activities, the level of mulch required to maintain a weed free environment within the basins should be assessed. Additional mulch may be applied at this time.

Should yellow starthistle be observed in some abundance during the first three years of monitoring, a post-emergent herbicide registered for use on rangeland and pastures may be employed. Agents such as aminopyralid or clopyralid should be applied early in the season (between December and March) when the starthistle seedling rosettes are less than 1.5" in diameter³⁴. Chemical spraying should not be conducted during windy conditions. As an alternative, selective grazing may also be utilized in the open grassland portions of the reclamation area once they are established. Grazing should be kept to areas where starthistle is most dense to prevent significant reduction of other planted species and those locations noted on the Reclamation Plan.

5.12.3 EROSION CONTROL

All disturbed non-rock surfaces will be seeded in accordance with the Grasslands section, including non-planted areas between woody plantings. Such seeding and fertilizing will be performed between August 15 and October 15 of any year to provide the best conditions for germination. In each area, where noted, the additional woody plant series shall be incorporated.

5.12.4 PLANT PROTECTION

Seeded areas will be protected from livestock through exclusionary fencing, either around each planting zone or around the larger quarry site to prevent compaction of freshly seeded soils until grassland is established and self-sustaining.

Individual plants will be protected from grazing livestock and deer through the use of protective hardware such as collars and screens. Tubes or screens wired onto collars installed around plants shall be maintained in good working order during Year 1 and 2 of the plant establishment period. Once seeds have germinated and stem growth has reached the height of screen, the screen will be opened at the top to allow the tree leader to grow. If browse becomes heavy on the planting benches, screens will be applied to those collars or access to benches will be fenced. At Year 3, the conditions of protective hardware and plants overall health will be evaluated and the protective hardware shall be removed if appropriate. All protective hardware will be removed upon successful revegetation.

³⁴ (DiTomaso, J.M. et al 2007)

5.12.5 PLANT REPLACEMENT

Dead plants will be replaced using the same species and methods as described in this reclamation plan unless it is determined by a qualified restoration ecologist or similar expert that a different species or method should be employed to improve the success rate. The selection of replacement plantings will be reliant on expert recommendations based on field conditions to achieve optimal success.

5.12.6 NATURAL RECRUITMENT

Natural recruitment of native trees and shrubs from adjoining areas is expected to occur. Care will be exercised to minimize damage to naturally recruited plants during site maintenance. Native plants that enter the planting areas as volunteer seedlings, offshoots, or by spillover from adjacent natural areas will be protected and their expansion encouraged. Poison oak will be allowed to spread into the project to the extent that worker safety can be maintained. Maintenance personnel must be trained to differentiate between native and non-native species.

5.12.7 MAINTENANCE SCHEDULE

The first year of maintenance will begin on the first day following acceptance of the installation phase by the project owners or their representative. The minimum frequency of site visits during the maintenance phase will be as follows:

March 1 through September 30

Year 1 – once every 10 days

Year 2 – once every three weeks

Year 3 – once every month

October 1 through February 28

Year 1 – once every month

Year 2 – once every six weeks or after large multi-day storms

Year 3 – once every other month or after large multi-day storms

Frequency of visits may need to be increased to address irrigation needs based on the adaptive management approach described above. The plant establishment period and associated site maintenance will be extended if human intervention is required to sustain the success rates noted. If the success rates are achieved after year 2 without human intervention, even if shorter than the time frames noted, monitoring may be terminated.

5.13 MONITORING

The purpose of the monitoring plan is to track vegetation establishment, assess the degree of revegetation success, and provide a basis for adaptive management recommendations. This will be achieved through both quantitative and qualitative monitoring activities. The goal for success is to have all areas self-sustaining for two years without human intervention.

The revegetation monitoring program will include the following tasks:

Visual Inspections: To provide quantitative and qualitative assessment of the revegetation program and for purposes of adaptive management, the newly planted areas will be visually inspected twice per year

during the first 2 years after planting and annually thereafter for 3 additional years. The newly planted areas will be visually inspected to quantitatively evaluate cover, density, species richness, plant mortality/survival of woody plant materials. Qualitative observations will include vegetative health, vigor, growth, needs and recommendations to achieve success criteria. The inspections will occur between May and June and again between October and November of each year.

Weed Management: Noxious weeds will be managed as described in Section 5.12.2.

Replanting: Replanting should be conducted if the survival rate of woody species is less than 25 percent.

Reporting: An annual reporting document will be submitted to Mendocino County Department of Planning & Building Services describing the visual inspection results as well as any replanting that may have taken place. Recommendations may also be included at this time if there is a large amount of failure in one area or that an area is successful and needs to be expanded into areas not so successful.

5.13.1 PERFORMANCE AND SUCCESS CRITERIA

The success of reclamation will be evaluated based on the quantitative performance and success criteria summarized below. Performance criteria for Years 1-4 are suggested interim performance standards for the operator. Success of the revegetation plan is achieved after final performance standards are met following two years without human intervention regardless of the time it takes to achieve that success.

Oak Woodlands

The following performance standards must be achieved in order for reclamation of the Oak Woodland community type to be considered complete.

Years 1–2 Minimum Performance Standard: At the end of the Year 1, 80 percent overall combined tree and shrub survival with a minimum of 3 *Quercus* spp. and 2 shrub species surviving with a health and vigor rating of at least 2, averaged across all species. There should be at least 50 percent grass cover, either by the grass species in the mix or by naturally recruited native or naturalized grasses and forbs occurring in the reference site. A minimum of 3 grass/forb species should be present. If criteria are not met, refer to remedial measures in section 5.14.

Years 3–4 Minimum Performance Standard: At the end of the Year 3, 80 percent overall combined tree and shrub survival with a minimum of 3 *Quercus* spp. and 2 shrub species surviving and a health and vigor rating of 2.5, averaged across all species. There should be at least 70 percent grass/forb cover, either by the grass species in the mix or by naturally recruited native or naturalized grasses and forbs occurring in the reference site. A minimum of 3 grass/forb species should be present. The primary function of the understory grass layer is to provide erosion control. Should there be any exposed soil at the end of Year 3, remedial measures should be taken to achieve complete cover. If criteria not met see remedial measures in section 5.14.

Final Success Standard: 80 percent overall combined tree and shrub survival rate with a minimum of 3 *Quercus* spp. and 2 shrub species surviving. There should be at least 70 percent grass/forb cover, either by the grass species in the mix or by naturally recruited native or naturalized grasses and forbs occurring in the reference site. A minimum of 3 grass/forb species should be present. The primary function of the understory grass layer in the oak woodland community is to provide erosion control. Success requires that there be no exposed soils. Final success standard is met following two years without human

intervention at which time further monitoring is no longer required. If criteria are not met, refer to remedial measures in section 5.14. A summary of the final success standards for trees and shrubs for each planting area is given in Table 13.

TABLE 13. FINAL SUCCESS STANDARDS – OAK WOODLANDS

Cover	10% cover all woody species 70% grasses/herbaceous layer
Density	30 trees/acre (minimum 276 oak trees at 2:1 replacement) 75 shrubs/acre
Species Richness	3 Quercus species 2 shrub species 3 grass species from native seed mix
Percent Survival	80% overall survival of woody plants

Grasslands

The following performance standards must be achieved in order for reclamation of the Grassland community type to be considered complete. The Year 1 performance standard is provided only as a suggestion to the operator and does not factor into the final success of the revegetation effort.

Year 1 Minimum Performance Standard: At the end of Year 1 there should be 50 percent vegetative cover of reclaimed grassland, either by the grass species in the hydroseed mix or by naturally recruited native or naturalized grasses and forbs occurring in the reference grassland site. A minimum of 3 grass/forb species should be present. If criteria are not met, remedial measures described in Section 5.14 should be implemented. Exposed soils should be re-seeded.

Year 2 Minimum Performance Standard: At the end of Year 1 there should be 75 percent vegetative cover of reclaimed grassland, either by the grass species in the hydroseed mix or by naturally recruited native or naturalized grasses and forbs occurring in the reference grassland site. A minimum of 3 grass/forb species should be present. If criteria are not met, remedial measures described in Section 5.14 should be implemented. 70 percent cover should be achieved by the end of Year 3. Exposed soils should be reseeded.

Final Success Standard: Final success is 70 percent vegetative cover of reclaimed grassland, either by the grass or forb species in the hydroseed mix or by naturally recruited native or naturalized grasses and forbs occurring in the reference grassland site. A minimum of 3 grass/forb species shall be present. The final success standard is met following two years without human intervention at which time further monitoring is not required. If criteria are not met, remedial measures described in Section 5.14 will be implemented.

A summary of the final success standards for grasslands is included in Table 14.

TABLE 14. FINAL SUCCESS STANDARDS – GRASSLANDS

Cover	70% cover
Species Richness	3 native grass species from the native seed mix or 3 native grass/forb species from reference grassland site

5.13.2 MONITORING METHODS

Semi-permanent transects will be established at random locations throughout the mixed oak woodland and grasslands community types. Two metal t-posts will be pounded into the ground at either end of the transect line. Percent woody plant survival (aggregate and individual species), as well as percent herbaceous vegetative cover (all herbaceous species combined) will be measured using the line intercept method (Bonham 1989). The total number of transects will be determined by evaluating the average survivorship and cover values obtained over increasing numbers of transects. The number of transects used will be the point where additional samples do not substantially change the average plant survival rate or cover value obtained (Kershaw 1973). The sample area may be slightly increased or decreased after initial data are collected and analyzed and the requisite sample surface area is reassessed.

Oak Woodlands

The **percent survival** for all woody plant species will be estimated by simple count of all living tree seedlings and shrubs divided by the total number of marked planting locations by transect and for all transects. For benches, trees and shrubs within 6 feet either side of the transect centerline will be counted. The 12-foot maximum transect width will be equally applied to the upper slopes and upper quarry floor.

- **Average health and vigor** will be determined by species for trees and shrubs in Years 1 and 3 to determine which species are best adapted to site conditions. Species counted along the transects will be rated for health and vigor. Those species with the highest health and vigor rating will be used for dead plant replacement. Final success (estimated at Year 5) will be determined based on the ability to survive without human intervention.
- The average health and vigor by shrub and tree species will be determined based on the following scale:

Ratings	Health and Vigor
0	Dead
1	Very Low Vigor
2	Low Vigor
3	Moderate Vigor
4	High Vigor
5	Very High Vigor

Grasslands

Vegetation cover is a good measure of grassland establishment and correlates with relative density and species richness. Therefore, the percent vegetative cover will be quantitatively monitored in Years 1 and 2 to evaluate the development of herbaceous vegetation. Herbaceous growth will be measured using photo monitoring in accordance with UC Monitoring method³⁵. Monitoring will occur twice during the first year (once just after establishment) and thereafter during peak herbaceous growth periods around June and July. Monitoring will occur for two years or until success criteria are met.

³⁵ (University of California, Division of Agricultural and Natural Resources 2003)

5.14 REMEDIAL MEASURES

5.14.1 OAK WOODLAND

If the survival rate falls below 80 percent, all dead trees and shrubs will be replaced via container planting or direct seeding of acorns. The most robust plant species exhibiting high survivorship would typically be utilized to replace the dead individuals; however, the minimum species richness noted above shall be considered when choosing replacement species. Adaptive management measures to increase survival could include additional plant protection hardware, deeper irrigation basins, more frequent irrigation, an increase in weeding, mulch or soil amendment, etc. If woody plant survival is just slightly under the success standard, then naturally recruited woody plants may be protected and counted.

If success criteria are not met in five years, then the reclamation methods will be re-evaluated and more intensive approaches will be developed and implemented with the prior approval of the lead agency and the State Department of Conservation.

5.14.2 GRASSLANDS

If the percent cover is less than 50 percent in Year 1, then additional soil preparation and re-sowing of seed in bare areas by the hand and rake method will be employed. If the cover is still less than 50 percent in Year 2, adaptive management measures, including additional soil placement, "rain for rent" irrigation, direct transplant of grass plugs, and substitute species will be considered. If the richness of species is deficient, a restoration ecologist or botanist may suggest replacement species to supplement the variety and to use for reseeding.

6 ADMINISTRATION

6.1 REPORTING

All monitoring results shall be recorded on monitoring data sheets developed for the project. Any recommended changes in the Reclamation Plan will be discussed with the Mendocino County Planning & Building Department prior to implementation. Monitoring findings will be correlated with identified transects in the field, such that the findings can be replicated if necessary. Transect t-posts will also serve as photo-documentation points. A minimum of three photographs will be taken per reclamation area during transect monitoring. Select photographs will be included in annual reports to further document monitoring findings.

Annual vegetation monitoring reports will be submitted by December 15 of Years 1, 2, 3 and 5, or until final success criteria are achieved, in each of the three stages of reclamation documenting the progress of vegetation establishment and Reclamation Plan performance for each phase. Milestones reached and problems encountered, including the adaptive management prescriptions being considered and/or implemented will be briefly discussed in each annual report.

6.2 FINANCIAL ASSURANCES

Financial assurances of Blue Ridge Rock Quarry are provided to ensure that reclamation is performed in accordance with the approved reclamation plan. Financial assurances will remain in effect for the duration of the surface mining operation and monitoring period until reclamation is completed. Each year the cost estimate for reclamation will be evaluated and provided to the County of Mendocino for approval. The financial assurances mechanism (surety bond, CD or letter of credit) will be submitted to the Mendocino County Department of Planning & Building Services within 30 days of approval of the financial assurance cost estimate. The financial assurances will continue to name the County of Mendocino and the State Department of Conservation as co-trustees.

The existing operation is guaranteed with a surety bond to ensure performance of reclamation. Costs of reclamation were last estimated on August 17, 2015 at \$218,765.50. This estimate reflected current physical site conditions at the quarry. The estimate is updated annually to reflect changes in site conditions and rates for equipment rental, labor, and materials. The most current cost estimate is provided in Appendix G.

Financial assurances will be released upon determination by the County of Mendocino that performance criteria have been met and reclamation is deemed complete.

7 CERTIFICATIONS

7.1 PREPARER'S SIGNATURE

Prepared by:
Crawford & Associates, Inc.



Cathy A. McKeon
Registered Civil Engineer

08/29/2016

Date
51026



Julie Price
Environmental Specialist, QISP

08/29/2016

Date
00167

A Reclamation Plan Amendment shall be required prior to any substantial revision of this Mining and Reclamation Plan as required by SMARA.

7.1.1 PREPARER'S SIGNATURE - AMENDMENT

This Reclamation Plan Amendment was prepared by:
Crawford & Associates, Inc.

07/06/2017

Julie Price	Date
Environmental Specialist, QISP #00167	

7.2 MINE OPERATOR CERTIFICATION

MONITORING

Pursuant to CCR Section 2273 (a), the success of reclamation will be monitored for three years, or until performance standards are met, provided that, during the last two years, there has been no human intervention, including, for example, irrigation, fertilization, or weeding. Remedial measures will be implemented as necessary to achieve the performance standards.

STATEMENT OF RESPONSIBILITIES

I, the undersigned, hereby agree to accept full responsibility for reclamation of all mined lands as described and submitted herein and in conformance with the applicable requirements of Articles 1 and 9 (commencing with Sections 3500 et seq. and 3700 et seq., respectively) of Chapter 8 of the Division 2 of Title 14 of the California Code of Regulations, the Surface Mining and Reclamation Act, Sections 2710 et seq. and with modifications requested by the administering agency as conditions of approval.

Signed this 6th day of Sept., 2016


James M. Syar, President
Syar Industries, Inc.

7.3 LEAD AGENCY CERTIFICATION

I, the undersigned, hereby certify that this reclamation plan complies with the applicable requirements of Articles 1 and 9 (commencing with Sections 3500 et seq. And 3700 et seq., respectively) of Chapter 8 of the Division 2 of Title 14 of the California Code of Regulations, and with the requirements of the Surface Mining and Reclamation Act, Sections 2710 et seq.

Signed this _____ day of _____, 20____

Director
Mendocino County Department of Planning & Building Services

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9 APPENDICES

- A. Exhibits
- B. Mining and Reclamation Plan Sheets
- C. Erosion Control Plan Sheets
- D. Permits
- E. Drainage Analysis
- F. Revegetation References
- G. Financial Assurance Cost Estimate
- H. Storm Water Pollution Prevention Plan*
- I. Parcel Map and Data*
- J. Legal Description of Mined Lands*
- K. Reclamation Plan Content Checklist*