

**BONNY DOON LIMESTONE QUARRY
BOUNDARY EXPANSION PROJECT
AND RECLAMATION PLAN AMENDMENT**

DRAFT ENVIRONMENTAL IMPACT REPORT

TABLE OF CONTENTS

Summary	S-1
S.1 Project Description.....	S-1
S.2 Impacts and Mitigation	S-1
S.3 Project Alternatives.....	S-7
 1.0 Introduction.....	1-1
1.1 Background	1-1
1.2 Intended Use of EIR.....	1-2
1.3 Permit Requirements.....	1-2
 2.0 Project Description.....	2-1
2.1 Project Location and Site Description	2-1
2.2 Project Goals and Objectives	2-2
2.3 Overview of Quarry Operations.....	2-2
2.3.1 Material Extraction and Processing	2-2
2.3.2 Disposal Areas	2-4
2.3.3 Drainage Controls	2-5
2.3.4 Water Requirements.....	2-5
2.3.5 Site Reclamation	2-5
2.4 Limestone Quarry Boundary Expansion.....	2-5
2.4.1 Vegetation, Topsoil and Overburden Removal	2-6
2.4.2 Overburden and Off-Spec Rock Disposal.....	2-7
2.4.3 Drainage Controls	2-8
2.4.4 Water Requirements.....	2-8
2.4.5 Site Reclamation	2-8
2.5 Reclamation Plan Amendment	2-9
2.5.1 Background	2-9
2.5.2 Proposed 1996 Reclamation Plan Amendment.....	2-9
2.6 Measures Incorporated Through Project Design	2-14
2.7 Issues of Public Concern.....	2-14
 3.0 County Plans and Policies.....	3-1
3.1 Environmental Setting	3-1
3.2 Regulatory Setting	3-1
3.2.1 General Plan/Local Coastal Program.....	3-2
3.2.2 Mining Regulations 16.54.050, Required Conditions and Standards for Mining Approval, Certificate of Compliance, Reclamation Plan Approval	3-5
3.2.3 Mining Regulations 16.54.055, Reclamation Standards.....	3-7
3.2.4 Use Permit 3236-U	3-10

3.2.5	Certificate of Compliance and Reclamation Plan Approval 89-0492	3-11
3.2.6	Sensitive Habitat Protection Ordinance.....	3-13
3.3	Project Impacts.....	3-14
3.3.1	Thresholds of Significance	3-14
3.3.2	Conformance with General Plan/Local Coastal Program.....	3-14
3.3.3	Conformance with Mining Regulations 16.54.050, Required Conditions and Standards for Mining Approval, Certificate of Compliance, Reclamation Plan Approval	3-17
3.3.4	Conformance with Mining Regulations 16.54.055, Reclamation Standards.....	3-19
3.3.5	Conformance with Use Permit 3236-U.....	3-21
3.3.6	Conformance with Certificate of Compliance and Reclamation Plan Approval 89-0492	3-24
3.4	Mitigation Measures	3-25
4.0	Geology and Soils	4-1
4.1	Environmental Setting	4-1
4.1.1	Physiographic Setting	4-2
4.1.2	Regional Geologic Setting	4-3
4.1.3	Regional Seismic Setting	4-3
4.1.4	Study Area Geologic Setting	4-7
4.2	Regulatory Setting	4-11
4.3	Project Impacts.....	4-12
4.3.1	Thresholds of Significance	4-12
4.3.2	Seismic Shaking Hazards.....	4-12
4.3.3	Seismically Induced Ground Deformation	4-15
4.3.4	Landsliding and Slope Instability	4-17
4.3.5	Erosion	4-24
4.3.6	Cumulative Impacts	4-27
4.4	Mitigation Measures	4-27
5.0	Hydrology and Water Quality.....	5-1
5.1	Environmental Setting	5-1
5.1.1	Hydrologic Setting.....	5-2
5.1.2	Hydrogeologic Setting	5-5
5.2	Regulatory Setting	5-22
5.2.1	County General Plan/Local Coastal Program	5-22
5.2.2	County Mining Regulations	5-22
5.2.3	California Water Code (Section 13000, Et Seq.)	5-22
5.2.4	Porter-Cologne Water Quality Control Act (Porter-Cologne).....	5-22
5.2.5	Central Coast Basin Plan	5-23
5.2.6	National Pollutant Discharge Elimination System (Npdes).....	5-23
5.2.7	Federal Clean Water Act.....	5-24
5.3	Project Impacts.....	5-24
5.3.1	Threshold of Significance	5-24
5.3.2	Hydrologic Impacts.....	5-25
5.3.3	Hydrogeologic Impacts	5-26
5.3.4	Cumulative Impacts	5-34
5.4	Mitigation Measures	5-35

6.0 Biological Resources	6-1
6.1 Environmental Setting	6-1
6.1.1 Regional Setting.....	6-1
6.1.2 Biological Study Area.....	6-1
6.1.3 Proposed Boundary Expansion Area	6-3
6.1.4 1996 Reclamation Plan Amendment	6-11
6.2 Regulatory Setting	6-13
6.2.1 Local	6-13
6.2.2 State.....	6-13
6.2.3 Federal.....	6-15
6.3 Project Impacts.....	6-17
6.3.1 Thresholds of Significance	6-17
6.3.2 Proposed Boundary Expansion Area	6-17
6.3.3 1996 Reclamation Plan Amendment	6-23
6.3.4 Cumulative Impacts	6-26
6.4 Mitigation Measures	6-28
7.0 Air Quality	7-1
7.1 Environmental Setting	7-1
7.1.1 Topography and Meteorology.....	7-1
7.1.2 Air Pollutants	7-5
7.1.3 Existing Ambient Air Quality.....	7-5
7.1.4 Sensitive Receptors.....	7-5
7.1.5 Previous Air Quality Studies	7-5
7.2 Regulatory Setting	7-6
7.2.1 Ambient Air Quality Standards	7-6
7.2.2 Diesel Particulate Matter.....	7-7
7.2.3 Monterey Bay Unified Air Pollution Control District (MBUAPCD).....	7-7
7.2.4 County of Santa Cruz.....	7-8
7.3 Project Impacts.....	7-8
7.3.1 Thresholds of Significance	7-8
7.3.2 Site Preparation.....	7-9
7.3.3 Expanded Quarry Operations.....	7-11
7.3.4 Diesel Particulate Toxic Air Contaminant.....	7-12
7.3.5 1996 Reclamation Plan Amendment	7-13
7.3.6 Cumulative Impact.....	7-13
7.4 Mitigation Measures	7-13
8.0 Noise	8-1
8.1 Environmental Setting	8-1
8.1.1 Noise Terminology	8-1
8.1.2 Sensitive Receptors.....	8-2
8.1.3 Ambient Noise Levels and Existing Operations.....	8-3
8.2 Regulatory Setting	8-5
8.3 Project Impacts.....	8-6
8.3.1 Thresholds of Significance	8-6
8.3.2 Site Preparation.....	8-6
8.3.3 Expanded Quarry Operations.....	8-7
8.3.4 1996 Reclamation Plan Amendment	8-8

8.3.5	Cumulative Impact.....	8-8
8.4	Mitigation Measures	8-8
9.0	Energy and Natural Resources.....	9-1
9.1	Environmental Setting	9-1
9.1.1	Timber Resources	9-1
9.1.2	Existing Energy Use	9-1
9.2	Regulatory Setting	9-1
9.3	Project Impacts.....	9-2
9.3.1	Thresholds of Significance	9-2
9.3.2	Site Preparation.....	9-2
9.3.3	Extended Operations.....	9-2
9.3.4	1996 Reclamation Plan Amendment	9-3
9.3.5	Cumulative Impact.....	9-3
9.4	Mitigation Measures	9-3
10.0	Project Alternatives.....	10-1
10.1	Considered and Rejected Alternatives	10-1
10.1.1	Alternative Project Locations	10-1
10.1.2	Full Boundary Expansion Alternative	10-1
10.1.3	Modified Legal Mining Limit Alternative.....	10-2
10.1.4	Reduced Boundary Expansion Area Alternative	10-2
10.1.5	Modified Overburden and Spoils Disposal Alternative.....	10-2
10.2	No Project Alternative	10-2
10.3	Environmentally Superior Alternative.....	10-5
11.0	CEQA Required Assessments.....	11-1
11.1	Significant Unavoidable Impacts	11-1
11.2	Irreversible Environmental Changes.....	11-1
11.3	Growth Inducing Impacts	11-1
11.4	Cumulative Impacts	11-1
11.4.1	Prior EIRs Consistent with Section 15183 of the State CEQA Guidelines	11-2
11.4.2	Effects of Other Local and Regional Projects.....	11-3
11.4.3	Assessment of Cumulative Impacts	11-4
11.5	Effects Found to be Not Significant.....	11-5
11.5.1	Aesthetics	11-5
11.5.2	Cultural Resources	11-5
11.5.3	Energy and Natural Resources.....	11-5
11.5.4	Services and Utilities	11-6
11.5.5	Traffic/Transportation.....	11-6
11.5.6	Land Use/Housing	11-6
11.5.7	Hazards	11-6
12.0	References.....	12-1
12.1	Bibliography	12-1
12.2	Persons Consulted.....	12-11
12.3	Report Preparers.....	12-11

Appendix A	Environmental Review Initial Study/Notice of Preparation and Comments
Appendix B	County Planning Policies
Appendix C	Plant and Wildlife Species Lists
Appendix D	Bonny Doon Quarries Alternative Revegetation Plan 2005 (Bound Separately)
Appendix E	Bonny Doon Planning Area Project List (May 2007)
Appendix F	Geologic, Hydrologic, and Hydrogeologic Technical Appendix for EIR, Bonny Doon Quarry Proposed Expansion (Bound Separately)

LIST OF FIGURES

- Figure 1 Regional Location
Figure 2 Project Vicinity
Figure 3 Limestone Quarry Facilities
Figure 4 Shale Quarry Facilities
Figure 5 Limestone Quarry Existing Contours
Figure 6 Currently Approved Limestone Quarry Final Development
Figure 7 Limestone Quarry Proposed Amendment to Mining Plan – 2007 Estimated Contours
Figure 8 Limestone Quarry Proposed Amendment to Mining Plan – 2012 Estimated Contours
Figure 9 Limestone Quarry Proposed Amendment to Mining Plan – Final Development
Figure 10 Limestone Quarry Proposed Amendment to Mining Plan – Final Drainage Plan
Figure 11 1996 Approved Revegetation Program – Limestone Quarry
Figure 12 1996 Approved Revegetation Program – Shale Quarry
Figure 13 Proposed Revegetation Program – Limestone Quarry
Figure 14 Proposed Revegetation Program – Shale Quarry
Figure 15 Zoning Map
Figure 16 Geological Study Area Topographic Map
Figure 17 Regional Topography
Figure 18 Regional Geologic Map
Figure 19 Local Geologic Map
Figure 20 Quarry Area Fracture Map
Figure 21 Regional Seismicity Map
Figure 22 Vicinity Topography
Figure 23 Approximate Quarry Area Drainages
Figure 24 Fracture Zones
Figure 25 Generalized Groundwater Surface Contour, Bonny Doon Area (ft msl)
Figure 26 Interpretation of Isotopic Survey and Specific Conduction Data
Figure 27 Summary of 2004 Tracer Test Results
Figure 28 Principal Groundwater Flow Paths
Figure 29 Average Timing of Liddel Spring and Runoff Responses to Storm Precipitation, 2004-2005
Figure 30 Conceptual Model of Seasonal Change in Groundwater Flow Pattern
Figure 31 Maximum Recorded Groundwater Surface Elevations
Figure 32 Biological Study Area
Figure 33 Limestone Quarry Existing Vegetation
Figure 34 Shale Quarry Existing Vegetation (2003)
Figure 35 Vegetation Communities and SFDW Houses
Figure 36 Woodrat Mitigation Sites at Limestone Quarry
Figure 37 Woodrat Mitigation Parcel at San Vincente Quarry
Figure 38 Sensitive Receptors

LIST OF TABLES

Table S-1 Summary of Project Impacts and Mitigation Measures	S-2
Table 1-1 Summary of Permit Requirements	1-3
Table 2-1 Overview of Proposed Amendment to Bonny Doon Quarries 1996 Reclamation Plan...	2-11
Table 2-2 Comparison of the Approved and Proposed Reclamation Plans by Vegetation Community (Acres).....	2-12
Table 2-3 Comparison of Vegetation Communities and Species Specified in Revegetation Plans	2-13
Table 3-1 Relevant County General Plan Policies for the Bonny Doon Limestone Quarry Boundary Expansion Project and Reclamation Plan Amendment	3-2
Table 3-2 County Mining Regulations 16.54.050 Required Conditions and Standards for Mining Approval, Certificate of Compliance, Reclamation Plan Approval	3-5
Table 3-3 County Mining Regulations 16.54.055 Reclamation Standards	3-8
Table 3-4 Conditions of Use Permit 3236-U Part III Bonny Doon Limestone Quarry	3-11
Table 3-5 Certificate of Compliance and Reclamation Plan Approval 89-0492 1997 Conditions of Approval	3-12
Table 4-1 Geologic Time Scale	4-2
Table 4-2 Distances and Directions to Local Faults	4-4
Table 4-3 Modified Mercalli Intensity Scale	4-5
Table 4-4 Deterministic Ground Motions.....	4-13
Table 4-5 Probabilistic Ground Motions	4-14
Table 6-1 Vegetation Communities and Species Specified in the 1996 Reclamation Plan Amendment	6-13
Table 6-2 Boundary Expansion Area Vegetation Community Impacts and Mitigation.....	6-18
Table 6-3 Comparison of the Approved and Proposed Reclamation Plans by Vegetation Community (Acres).....	6-20
Table 6-4 Comparison of Vegetation Communities and Species Specified in the 1996 Reclamation Plan Amendment and the Mitigated 1996 Reclamation Plan Amendment	6-25
Table 7-1 Distance to Sensitive Receptors	7-3
Table 7-2 Table 7-2 Desert Research Institute Local PM10 Monitoring 1998-1999 (PM10 ug/m ³)	7-5
Table 7-3 Desert Research Institute Local PM10 Monitoring 1998-1999 (PM10 ug/m ³).....	7-6
Table 7-4 Thresholds of Significance for Criteria Pollutants of Concern Operational Impacts..	7-9
Table 7-5 Bonny Doon Quarry Expansion Area Site Preparation Off-Highway Equipment Emissions.....	7-10
Table 8-1 Typical Outdoor Noise Levels.....	8-1
Table 8-2 Limestone Quarry Equipment Noise Levels (Leq) Normalized to a Distance of 50 Feet	8-3

LIST OF ACRONYMS, ABBRVIATIONS, AND SYMBOLS

Acronym/ Abbreviation/Symbol	Full Phrase or Description
µg/m ³	microgram per cubic meter
AAQS	Ambient Air Quality Standards
ac-ft/yr	acre-feet per year
ANFO	ammonium nitrate and fuel oil
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CCC	California Coastal Commission
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cm	centimeter
CNDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
COC	Certificate of Compliance
County	County of Santa Cruz
CRLF	California red-legged frog (<i>Rana aurora draytonii</i>)
CSC	California Species of Special Concern
CWA	Clean Water Act
D	Deuterium
DB	Decibel
dBA	A-Weighted Decibel
DPM	Diesel Particulate Matter
dba	Doing Business As
DRI	Desert Research Institute
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FE	federally-listed as endangered
FT	federally-listed as threatened
ft msl	feet above mean sea level
FYLF	foothill yellow-legged frog (<i>Rana boylii</i>)
g	one "g" is equivalent to the acceleration of the earth's gravity
gm/yd ³	Grams per cubic yard of earth moved

Acronym/ Abbreviation/Symbol	Full Phrase or Description
GP/LCP	County of Santa Cruz General Plan/Local Coastal Program
gpm	gallons per minute
H	Hydrogen
HCP	Bonny Doon Quarries Habitat Conservation Plan
hydrophytic	growing wholly or partially in water
in/yr	inches per year
ISC	U.S. EPA Industrial Source Complex model
L25	e.g., (60 dBA for a cumulative period of 15 minutes during any hour of operation) i.e. L25
Ldn	Day/night average noise level
Leq	Equivalent noise level - the level of a steady noise having the same sound energy as the time-varying noise measured
Leq (h)	Equavalent noise level - time-weighted average for a 60-minute (hourly) period
LQ	Bonny Doon Limestone Quarry
Ma	Millions of years before present
magma	molten rock
MBTA	Migratory Bird Treaty Act
MBUAPCD	Monterey Bay Unified Air Pollution Control District
MOA	Memorandum of Agreement
msl	above mean sea level
Mw	moment magnitude
MwMAX	Momentum magnitude of maximum credible earthquake
My	millions of years
NAAQS	National Ambient Air Quality Standards
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOx	nitrogen oxides
NO ₂	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
¹⁶ O	Oxygen-16
¹⁸ O	Oxygen-18
OEHHA	California Office of Environmental Health Hazard Assessment
Pb	Lead
PGA	estimated mean peak horizontal ground acceleration
PGA + M	mean peak horizontal ground acceleration plus one dispersion
PGA + ∂	mean peak horizontal ground acceleration plus one dispersion

Acronym/ Abbreviation/Symbol	Full Phrase or Description
PM10	particulate matter less than or equal to 10 microns in diameter
PM2.5	particulate matter less than or equal to 2.5 microns in diameter
Porter-Cologne	Porter-Cologne Water Quality Act of 1969
ppm	parts per million
RHGA	repeatable high ground acceleration
RI	recurrence interval
ROG	Reactive organic gases
RWQCB	RWQCB
SAA	CDFG Streambed Alteration Agreement
SFDW	San Francisco dusky-footed woodrat (<i>Neotoma fuscipes annectens</i>)
SMGB	State Mining and Geology Board
SMARA	Surface Mining and Reclamation Act
SOx	sulfur oxides
SQ	Bonny Doon Shale Quarry
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic Air Contaminants
TRA	TRA Environmental Sciences, Inc.
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United State Geological Survey
VOC	volatile organic compounds
WDRs	waste discharge requirements
WYs	water years