Celatom Mine Plan of Operations

Celatom Mining Complex

Malheur & Harney Counties

Eastern Oregon

Index

1.0 Operator Information Requirement
- 1.1 Executive Summary

2.0 Celatom Mining Complex Overview
- 2.1 History of Celatom Facility and General Description
- 2.2 Location of Celatom Mining Complex
- 2.3 Geologic Conditions
- 2.4 Active Working Areas
- 2.5 Future Working Areas
- 2.6 Products Produced from Diatomite Ore

3.0 Mining Activities
- 3.1 Period of Operations
- 3.2 Mine Camp
- 3.3 Mine Power Supply
- 3.4 Mine Water Supply
- 3.5 Exploratory, Developmental, and Production Drilling
- 3.6 Bulk Sampling
- 3.7 Mining Methods
- 3.8 Quality Assurance Plans
- 3.9 Mine Roadways
- 3.10 Ore Stockpiling & Haulage
- 3.11 Waste Stockpiles
- 3.12 Mine Equipment
- 3.13 Permitted Operating Areas

4.0 Spill Contingency Plans
- 4.1 Fuel & Oil Storage and Spill Prevention & Control

5.0 Water Management Plans
- 5.1 Storm Water Runoff Control
- 5.2 Pit Dewatering

6.0 Rock Characterization and Handling Plans

7.0 Dust Abatement Measures
- 7.1 Dust Generation
- 7.2 Dust Abatement

8.0 Reclamation
- 8.1 Reclamation Overview
- 8.2 Drill-hole Plugging
- 8.3 Re-grading and Reshaping
- 8.4 Mine Reclamation, with Pit Backfilling Information
- 8.5 Interim Reclamation
- 8.6 Seeding & Topsoil Preparation
- 8.7 Riparian Mitigation
- 8.8 Wildlife Habitat Rehabilitation
- 8.9 Isolation and Control of Acid-Forming, Toxic or Deleterious Material
- 8.10 Removal or Stabilization of Buildings, Structures and Support Facilities
- 8.11 Post-closure Management

9.0 Monitoring Plans
- 9.1 Type and Location of Monitoring Devices
- 9.2 Sampling Parameters and Frequency
- 9.3 Analytical Methods
- 9.4 Reporting Procedures
- 9.5 Procedures to Respond to Adverse Monitoring Results

10.0 Interim Management Plan
- 10.1 Measures to Stabilize Excavations and Workings
- 10.2 Measures to Isolate or Control Toxic or Deleterious Materials
- 10.3 Provisions for the Storage or Removal of Equipment, Supplied and Structures
- 10.4 Measures to Maintain the Project Area in a Safe and Clean Condition
- 10.5 Plans for Monitoring Site Conditions During Periods of Non-operation
- 10.6 Mining Schedule

11.0 Beede Desert Mine Site
- 11.1 Location and Access
- 11.2 Geologic Conditions
- 11.3 Ore
- 11.4 Pit Dewatering and Storm Water Runoff Control
- 11.5 Mining Methods
- 11.6 Ore Stockpiling
- 11.7 Waste Stockpiles
- 11.8 Reclamation

12.0 Hidden Valley
- 12.1 Location and Access
- 12.2 Geologic Conditions
- 12.3 Ore

12.4 Pit Dewatering and Storm Water Control
12.5 Mining Methods
12.6 Ore Stockpiling
12.7 Mine and Mineral process waste Stockpiles
12.8 Hidden Valley Mine Reclamation

13.0 Section 36 Mine Site
13.1 Location and Access
13.2 Geologic Conditions
13.3 Ore
13.4 Storm Water Control and Pit Dewatering
13.5 Mining Methods
13.6 Ore Stockpiling
13.7 Mine Waste Stockpiles
13.8 Reclamation

14.0 Kelly Field Mine Site
14.1 Location and Access
14.2 Geologic Conditions
14.3 Ore
14.4 Slope Stability
14.5 Storm Water Control and Pit Dewatering
14.6 Mining Methods
14.7 Ore Stockpiling
14.8 Mine and Mineral process waste Stockpiles
14.9 Reclamation

15.0 North Kelly Field (Section 19 & 25)
15.1 Location and Access
15.2 Geologic Conditions
15.3 Ore
15.4 Storm Water Control and Pit Dewatering
15.5 Mining Methods
15.6 Ore Stockpiling
15.7 Mine and Mineral process waste Stockpiles
15.8 Reclamation

16.0 The Eagle Pit (Section 27)
16.1 Location and Access
16.2 Geologic Conditions
16.3 Ore
16.4 Storm Water Control and Pit Dewatering
16.5 Mining Methods
16.6 Ore Stockpiling
16.7 Mine and Mineral process waste Stockpiles
16.8 Reclamation

17.0 Section 25
- **17.1 Location and Access**
- **17.2 Geologic Conditions**
- **17.3 Ore**
- **17.4 Storm Water Control and Pit Dewatering**
- **17.5 Mining Methods**
- **17.6 Ore Stockpiling**
- **17.7 Mine and Mineral process waste Stockpiles**
- **17.8 Section 25 Reclamation**

18.0 Vines Hill Stockpile Area
- **18.1 Location and Access**
- **18.2 Storm Water Control**
- **18.3 Ore Stockpiling**
- **18.4 Dust Abatement**
- **18.5 Vines Hill Stockpile Area Reclamation**

19.0 Supplemental Mine Activities
- **19.1 Winterization**
- **19.2 Grazing Allotments**
- **19.3 Timber Inventory**
- **19.4 Noxious Weeds**
- **19.5 Stock Raising Homestead Act**
- **19.6 Mine Safety and Health Administration**

20 Summary

21 Appendix

1.0 Operator Information Requirement

Operator Name
Corporate Office:
EP Minerals LLC
9785 Gateway Drive
Suite 1000
Reno, Nevada 89521
(775) 824-7600
(775) 824-7601

Taxpayer Identification Number:
204605079

BLM Serial Number(s) of involved unpatented claims where disturbance would occur:

See appendix article 5 for mining claim serial numbers.

Point of contact for corporation:
Jim Taipale-Site Operations Manager, Celatom Operations
2630 Graham Blvd.
Vale, Oregon 97918
(541) 473-3285 **x**13104
(541) 473-3463

Operator will notify BLM, in writing, within thirty (30) days regarding any change in corporate point of contact.

1.1 Executive Summary

Diatomaceous Earth (DE), otherwise known as Kieselguhr or diatomite, is a sedimentary mineral with physical properties that are similar to soil. In Oregon, diatomite is the silica skeletons of billions of single-celled living microscopic algae organisms deposited millions of years ago at the bottom of fresh water lakes. The remains of these single-celled organisms create a soft siliceous material with some very unique chemical and physical properties. When dried, DE contains >80% voids by volume.

DE has a very high surface area with good insulation characteristics, high absorption, and low permeability. It is inert and durable like sand, yet supporting of plant growth and water conservation. DE is sold into a myriad of applications including the filtration of food and beverage products (like fruit juice, corn syrup, and beer), animal feed additives, and horticultural and soil amendment markets. In swimming pool applications, DE is the most effective material known to man for the removal of Giardia and Cryptosporidium parasites.

The Celatom Mining Complex mines DE in a remote area of Eastern Oregon on the boundaries of Malheur and Harney counties. Mining activities have been underway since 1985 and it is the intention of EP Minerals to continue mining in this area for the foreseeable future. While there are many years of proven reserves already existing, continuously changing markets and depletion of specific ores require that EP Minerals develop new DE deposits with unique chemical and physical properties.

As exploration and mine development continues to expand, the area near the existing pits has excellent potential for finding new ore reserves. Mining activity is currently focused in three different areas of the Celatom Mining Complex, namely: Beede Desert, Section 36, and Kelly Field. However, EP minerals intends to develop a fourth mining area known as Hidden Valley and as the Hidden Valley mine is developed, the Beede Desert area will be reclaimed. Mining activity will also occur in the North Kelly Field, Section 25, and the Eagle Mine areas in future years. All ores mined from the Celatom Mining Complex are stockpiled on site, and then hauled to a processing facility located seventy miles west of Vale Oregon.

EP Minerals has previously constructed the necessary infrastructure to operate the Celatom Mining Complex; presently all facilities are located in the Section 36 mine area. On site facilities include generators for power generation, mobile equipment servicing facilities, water wells to supply water for dust suppression, fuel storage and a mine camp used by mine personnel during the mining season. The mining season generally starts in the early spring and lasts well into the fall, depending on weather and business needs, but may run year-round depending on market demand. During the mining season, EP Minerals generally employs two crews of workers, working twelve hours per day, seven days per week throughout the mining season. The number of crews and hours worked vary depending on stripping and plant requirements.

The Celatom Mining Complex contains ores that possess different characteristics which affect the properties of the various grades of finished products. There are three main ore types found in the Celatom Mining Complex; they are oxidized ores, transition ores, and un-oxidized ores. Coincident with ore mining, is the generation of mine waste which is a mixture of poor quality diatomite, volcanic ash, clay, and other ore wastes. In addition to the mine waste, the plant also generates a waste stream known as “mineral process waste” which is low-grade ore materials rejected by the plant; this material is backhauled to the mine areas and is used to back fill previously mined-out pits. Both types of waste materials have been, and will continue to be, placed in one or more of the waste stockpiles located in each of the operating areas of the Celatom Mining Complex.

The Beede Desert mine contains primarily oxidized ores that offer improved clarity for products produced for the filtration markets. However, based on our current understanding of the area, this ore deposit is nearly depleted, and is to be replaced by ores mined from within the Hidden Valley area. Please refer to the following map as a reference for all mining locations.

In Section 36, all three ore types are found and extracted; however, the bulk of the deposit in Section 36 is un-oxidized ore. Presently, mining occurs in two different areas located within Section 36, they are the “Main” pit and the “East” pit. The majority of past mining activity occurred in the main pit; however, new product requirements will require considerable expansion of the East Pit area over the next five years.

The Kelly Field mine site, like Section 36, has oxidized ores, transition ores, and un-oxidized ores. The majority of the plant’s ore requirements will come from the Kelly Field mine over the next several years. The slope failures which occurred in 2003 and 2008 on Agency mountain in the Kelly Field mine will be fully remediated. This process will take several years to complete but has been initiated. In order for the 2008 slope failure to be fully remediated the new project boundary must be established.

The Section 25 mining area is situated between the Kelly Field and Section 36 mine sites. Mining in Section 25 is possible in the future and will involve the excavation of all ore types. It is highly likely that mining will progress from either the Kelly Field mine or the Section 36 mine into Section 25.

The Hidden Valley project will involve developing a new mining area in a secluded valley located between Beede Desert and the Section 36 mine areas. EP Minerals estimates that the ore reserves located in the Hidden Valley deposit will last between 10 to 20 years, based on current ore blending requirements. A preliminary pit design along with associated stockpile areas, waste stockpiles, access roads, and drainage systems has been designed and is discussed in further detail later on in this report.

The North Kelly Field mine will be located directly north of the current Kelly Field workings; this ore body is estimated to contain many years of ore reserves.

Insert Celatom Mine Complex Map here (11X17)
(Article 4 map)

Insert Vines Hill Map Here
(11 x 17)

The Eagle Mine will be located directly north of the Beede Desert pit. The deposit located in the Eagle Mine area contains all ore types and will be mined with open-pit mining techniques. The Eagle Mine will have a single large pit considerably larger than Beede Desert. There are many years of reserves located within the Eagle Mine.

As market conditions change, unique and specific ores must be discovered and developed to supply this demand; moreover, EP Minerals also needs to replenish mined-out reserves. In order to meet these needs, additional exploration and development drilling will be required throughout the Celatom Mining Complex. EP Minerals utilizes three different types of drilling methods to fulfill these needs. *Exploratory drilling* is required to find new ore bodies and to determine the extent of any known ore deposits. *Developmental drilling* is then used to better identify the unique properties of ore from each area, and create long-term mine plans. Once extraction begins, *Production drilling* then helps to more accurately separate ore & waste by various quality properties. Of these three types of drilling; only exploration drilling is required to be reclaimed and bonded. Development and production drilling is done inside the excavation and is generally part of the mining process.

Two other documents are commonly referenced throughout this report. The first document is the, “2008 Reclamation Plans for Celatom” which details the cost and process of reclaiming all of the current working areas comprising the Celatom Mining Complex; this report was completed in January of 2008 by EP Minerals. The second document is the, “March 2010 Baseline Characterization Report” completed by SRK Consulting. This report contains a detailed hydro-geologic study of the ground water system in the Celatom Mining Complex; it also contains a detailed analysis of both the mineral process waste and the mine waste. Multiple ground water monitoring wells and piezometers were installed as part of this study. Both reports are included within the appendix of this report.

Since mining began in the Celatom Mining Complex in 1986, EP Minerals has completed many other activities that support the responsible operation of the Celatom Mine Complex. These include water quality sampling, monitoring weather conditions, the construction and donation of improved roadways to Harney County or the BLM, and an active storm water management program to ensure turbid storm water or mine waters have not been discharged into the local drainage systems. EP Minerals is very pleased that over the past 20+ years, the mine has been recognized by the state and other agencies for excellence in management and reclamation practices. In addition, there have been no violations cited for environmental excursions. EP Minerals has every intention to continue conducting open pit mining operations in accordance with all federal, state, and local regulations while maintaining good relations with all neighbors.

2.0 Celatom Mining Complex Overview

2.1 History of Celatom Facility & General Description

Diatomaceous Earth (DE), otherwise known as Kieselguhr or diatomite, is a sedimentary mineral with physical properties that are similar to soil. In Oregon, diatomite is the silica skeletons of billions of single-celled living algae organisms deposited millions of years ago at the bottom of fresh water lakes. The remains of these single celled organisms create a soft siliceous material with some very unique chemical and physical properties. When dried, DE contains >80% voids by volume.

DE has a very high surface area with good insulation characteristics, high absorption, and low permeability. It is inert and durable like sand, yet supporting of plant growth and water conservation. DE is sold into a myriad of applications including the filtration of food and beverage products (like fruit juice, corn syrup, and beer), animal feed additives, and horticultural and soil amendment markets. In swimming pool applications, DE is the most effective material known to man for the removal of Giardia and Cryptosporidium parasites.

EP Minerals operates three different DE operations. The Celatom Complex is one of these operations and is located in Oregon while the other two facilities are located near Lovelock, Nevada and Clark, Nevada. All three facilities process DE in rotary kilns for use in the global industrial minerals marketplace. There are literally hundreds of marketing applications and thousands of customers served by these plants.

In 1985 Eagle-Picher Ind., Inc. submitted a plan of operations to conduct mining operations in the Celatom Mining District. Since that time, the plan of operations has been revised and resubmitted for operational or legal reasons. It is also important to mention that the company has undergone several name changes between 1985 and present day; throughout the text of this document, and in permits referenced, one will see all previous and current names. In November of 1986, Eagle-Picher Ind. (Minerals Division) became Eagle-Picher Minerals Inc. a wholly owned subsidiary of Eagle-Picher Ind. Inc. In April of 2003, the parent company Eagle-Picher Industries became Eagle Picher Inc., and Eagle-Picher Minerals Inc. was renamed Eagle Picher Filtration & Minerals Inc. The last name change occurred in 2006 when Eagle Picher Filtration & Minerals Inc. was renamed EP Minerals LLC. On August 1, 2011, EP Minerals, LLC was acquired by Golden Gate Capital. All of the above-mentioned names refer to the mine operator of the Celatom Mining Complex.

The Celatom Mining Complex is currently operated by EP Minerals, LLC which is a Nevada based company licensed to operate in Oregon. EP Minerals LLC is a division of the parent company EP Management Corporation. EP Management Corporation's headquarters are located in Dearborn, Michigan, whereas EP Minerals' headquarters are located in Reno Nevada.

Exploratory drilling for the Celatom ore deposit began in the late 1970's and continues today. After completing an extensive initial exploratory drilling campaign and ore testing program, mining operations commenced in 1985 and have continued seasonally every year since that time.

The Celatom Mining Complex is part of the Celatom Facility. The Celatom mine to date operates seasonally in the late spring, summer, and early fall. The mine extracts and stockpiles quality ore for use in the processing facility which is located seven miles west of Vale Oregon at milepost 238 of US Highway 20. The processing facility operates twenty-four hours per day, 365 days per year. Finished products are shipped via rail and truck for delivery around the globe.

The Vines Hill Stockpile Area is also part of the Celatom Facility whose function is to supply ore to the processing plant when the mine is inaccessible. The Vines Hill Stockpile Area was constructed in 1986 and has been in use ever since...

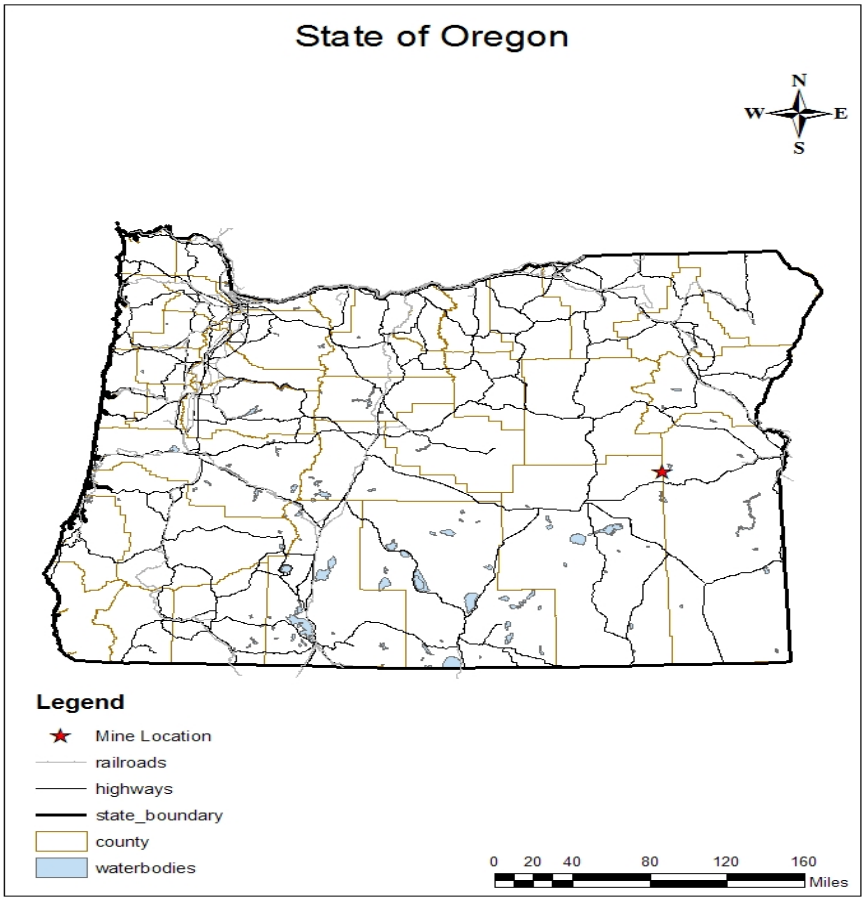
2.2 Location of Celatom Mining Complex

The Celatom Mining Complex is located in north western Malheur and north eastern Harney Counties in eastern Oregon. More specifically active operations are located in Sections 33, 34, and 36 Township 19S Range 36EWM in Harney County and in Section 30 Township 19S Range 37EWM and Section 33 of Township 19S Range 43E in Malheur County. Local points of reference include the small towns of Drewsey and Juntura Oregon, Beulah Reservoir, and Castle Rock. The local economy is dominated by ranching activities and the vegetation in the area supports dry land grazing of cattle or other livestock. The mine may be accessed via several gravel roadways from all directions. The primary route of entry is a paved road which extends north from US Highway 20 at milepost 181 to the mine site. This roadway was constructed by EP Minerals to allow easy access to the mining operation[1].

The Celatom Mining Complex operates on federal, state, and private lands. All federal lands are managed by the Bureau of Land Management (BLM) in Burns, Oregon. Operations on Oregon state and private lands are overseen by the Oregon Department of Geology and Mineral Industries (DOGAMI) in Albany, OR. All operations on public lands operate under an appropriate placer mining claim or mill site claim. The exact number of claims will vary due to economic and geologic factors. As the Celatom Mining Area is further developed, additional mill site and/or placer claims will be filed. EP Minerals also holds private lands that are part of the mine operations. EP Minerals retains the right to purchase additional properties from private parties to expand the operation or sell properties that are no longer required.[2]

[1] Articles 2, 3, and 4 of the appendix for maps illustrating the location of the Celatom Mining Complex.
[2] Articles 5 and 6 in the appendix for the maps outlining the state, federal, and private properties as well as all claims currently held by EP Minerals.

The Vines Hill Stockpile Area is located in central Malheur County in eastern Oregon approximately 13.5 miles southwest of Vale, Oregon off of highway 20; more specifically, in NE ¼ of Section 33 of Township 19S, Range 43EWM. This area is situated on seven mill site claims and is accessed by a one-mile access road that was built in 1986. The Vines Hill site operated under its own BLM approved plan of operations since 1986; however, the Vines Hill plan of operations will now be incorporated into the Celatom Mine Plan of Operations.



2.3 Geologic Conditions

The Celatom Mining Complex is geologically located within the Intermountain Plateau System. Highlands with mild to moderate slopes being separated by river valleys are typical of this geologic area. More specifically, the mine operations are located within the Juntura and Otis basins. These basins contain lacustrine sediments deposited throughout the Miocene and the early Pliocene geologic time periods. The most common type of rock found throughout the mining operation is basalt. The basalt in this area was part of the Columbia River Basalt Group. These large Basalt flows disrupted the meteoritic water drainage resulting in the creation of numerous inland freshwater lakes. The silica rich environment of the large freshwater lakes provided the perfect

habitat for diatoms. The deposit in which the Celatom mine is located was created during the Tertiary geologic time period and is comprised of thick beds of DE with numerous ash seams. Waterborne sediments such as siltstone, mudstone, clay, and sandstone are also present in thinly bedded layers. The thickness of the diatomite varies due to the topography of the lake beds, the depositional environment present while the deposit was formed, and the erosion that has occurred since the time of deposition.[3]

The inland lakes created as a result of the volcanic activity were rich in organic material, especially diatoms. These lakes had a diverse mineral assemblage including primary elements such as silica, aluminum, carbon, and iron; however, lesser quantities of calcium, sulfur, magnesium, potassium, and sodium were also present. Each deposit has unique and different chemical and physical properties.[4] DE deposits are the end result of the collection of a number of elements generated by regional, geological, and biological processes in the sedimentary depositional environment. Weathering of localized volcanic rocks caused the mobilization of site-specific elements, such as silica (SiO_2) from welded tuffs, lime (CaO) from anorthite, and iron sulfide (FeS_{2-x}) from welded tuffs; all of these are commonly found near the Celatom Mining Complex. No elemental sulfur has ever been observed, collected, or measured at the deposit. Only biological sulfur and sulfur bearing mineral species are known to exist.

The centric diatoms living in the inland lakes assimilated the dissolved silica and produced billions of biological opaline silica (SiO_2 H_2O) frustules; it is these frustules which comprise the bulk of an economic diatomite deposit. The deep water lake environment that fostered the centric diatoms in the upper aerobic portions of the lake also provided an excellent anaerobic habitat for iron fixing bacteria that were actively collecting iron and sulfides near the lake bottom. When the growth was most advantageous, minute amounts of bacterial pyrite grains were deposited with the diatomite sediments during the diatomite deposition.

When the depositional environment changed, and the inland lakes dried out due to climate change or geologic uplift, evaporation of the water allowed lime and sulfur trioxide to combine in the pore openings thereby forming gypsum ($CaSO_4$ $2H_2O$). With continued climate change or uplift, pyrite decomposition and desiccation of the deposit promoted gypsum crystal growth along the most conducive strata thereby enriching select bedding planes. Most recently gypsum was remobilized and crystallized along some fault surfaces. The most common sulfur bearing mineral in the deposit is gypsum.

This deposit of DE contains different species of diatoms as well as various levels of weathering. The upper portion of the diatomite deposit contains a zone that has undergone substantial weathering; this zone is known as “oxidized” ore. Separating the upper and lower portions of the deposit is a material that has undergone moderate levels of weathering; this zone is known as “transition” ore. The lower portions of the deposit contain a material that has undergone little to no weathering; this zone is known

[3] Appendix article 7 for a geologic map, provided by SRK, of the mine area.
[4] Appendix article 10 tables 1.0 and 2.0 listing common elements and percentages in the active operating areas.

as “un-oxidized” ore. Although there are visible differences between each of the ore types, this does not indicate a species change.

The oxidized ore is found in the upper portions of the deposit and is easily identifiable by its bright white color and low moisture content; moreover, decomposed ash and clay seams are common throughout the oxidized zone. The primary agent responsible for the oxidization of the upper strata of the ore body is the migration of meteoric water. Very little sulfur or iron is found in the oxidized strata. Trace amounts of minerals such as iron pyrite (FeS_2), gypsum ($CaSO_4$ $2H_2O$), goethite (Fe_2O_3 H_2O), and disseminated amorphous ferric hydroxide ($Fe(OH)$) are found in the oxidized strata. Since the time of deposition, calcium has combined with the organic sulfur to form gypsum. Volcanic generated iron sulfide, is the probable source of the latter organic iron and sulfur in the deposit. The pyrite has also oxidized into goethite which in turn has combined with groundwater forming limonite.

The transition ore zone is normally tan in color and contains mild to moderate iron staining. Higher concentrations of iron, sulfur, and gypsum are typical of the transition ore strata; moreover, decomposed ash and clay seams are found within the transition ore zones.

The un-oxidized ores are commonly called “green” ores due to their dark green or nearly black color, and their higher level of organics. Green ores also contain organic sulfur that has been identified by smelling a raw ore sample. The carbon, iron, calcium, and sulfur present in the un-oxidized ore strata have undergone little alteration since their deposition. Gypsum has migrated with the meteoric water flow and is found as micro coatings in the fault zones of the underlying strata. Iron sulfide has agglomerated into random nodules that are sparsely distributed throughout the un-oxidized ore strata. The iron sulfide minerals have also coated some of the high angle fault surfaces, and on rare occasions, have formed small nodules around fossil nuclei. Near the transition strata boundary, the sulfide nodules contain halos of alteration of varying degrees ranging from goethite to limonite. The un-oxidized ore retains much of the organic material from the diatoms, and as a result, contains much higher moisture content than either the oxidized or transition ores. Ash seams are also a very common feature in the un-oxidized ore zones.[5]

2.4 Active Working Areas

The Celatom Mining Complex is comprised of three operating areas. Each of these areas contains at least one open pit mine. The three operating areas are called Section 36, Kelly Field, and Beede Desert. Although diatomite ore is mined from all three of these areas, each mine area has ore with unique characteristics that is used to produce products with specific end uses.

[5] Appendix article 8 contains photographs of the various types of ore.

The Beede Desert operation is located in Sections 33 and 34 of Township 19S Range 36EWM in Harney County. Beede Desert is located along the eastern side of Otis valley and has been in operation since 1986 on a patented mining claim. Beede Desert is a small operation with a total of 98 disturbed acres. Although there is a limited quantity of un-oxidized ore located in that area of the deposit, only oxidized ores have been mined from the Beede Desert pit. The Beede deposit is different from all of the other ore deposits in the Celatom complex in that it is very shallow; the deposit is also very flat and has a very low angle of dip. Mining continues at the Beede Desert operation, albeit, at a declining amount due to the depletion of ore reserves, as a result, it will soon progress into the reclamation phase of the mining process.[6]

The mine shop, mine office, equipment staging and fueling areas, mine camp, and two open pits are all located in Section 36 Township 19S Range 36EWM in Harney County. This area is simply named for the section in which it is located and is referred to as Section 36. Section 36 belongs to the state of Oregon and is leased by EP Minerals. All types of ores are found and have been mined from this section. The main pit located in the western half of the section currently reaches 90 feet in depth; the depth of this pit will be based on either economic limitations, or the depletion of extractable ore. Current projections estimate that the total depth of the main pit should not extend below an elevation of 3600 feet above sea level.

The East Pit portion of the Section 36 operation is in the initial stages of pit development and is therefore shallow in depth at this time. The East Pit will continue to expand with the lowest level expected to have an elevation of 3840 feet above sea level; this means that the total pit depth will be approximately 100 feet deep. The main pit and the East Pit in this section are separated by the Mill Gulch drainage ditch which contains a non-perennial stream. A one-hundred foot setback of pit limits will be maintained from Mill Gulch, except where roadway or haulage way crossings are needed. Currently there exist several stockpiles or mine haulage ways within one-hundred feet of Mill Gulch. These will remain so long as turbid storm water run-off can be controlled. These roads will have culverts provided as needed to accommodate a 100 year storm event. The total disturbed area in Section 36 is currently 185 acres. The equipment staging area, mine camp, mine shop, and mine office will remain in this section for the foreseeable future.

The Kelly Field operation is located in Section 30 Township 19S Range 37EWM in Malheur County. The Kelly Field pit is located on a combination of placer claims and private property owned by EP Minerals. As in Section 36 a variety of ore types are present and are currently being mined from the Kelly Field operation. The Kelly Field pit is currently the largest pit in the Celatom complex with a total disturbed area of 183 acres. The pit is located on the east side of Mill Gulch and could potentially reach a depth of 200 feet. The final depth of the pit will be determined by the economic pit limit.

In 2003, and again in 2008 highwall failures occurred along the eastern edge of the Kelly Field pit at the base of Agency Mountain. These slides took place along the

[6] Please see articles 11 and 20 of the appendix for aerial photographs of the Beede Desert mine.

contact between the ore and a weathered volcanic host rock; it was a classic rotational failure Work to remediate this area, and to establish a stable final pit wall in the basaltic rock of Agency Mountain, commenced in 2006 and will continue until sufficient material can be removed, and this wall stabilized. Since the exact depth of the deposit has yet to be determined, the final location of the eastern most pit wall is not certain; however, it is expected to run approximately parallel with Agency Mountain.[7] Once completed a final benched pit wall in basalt rock will remain along the western side of Agency Mountain.

2.5 Future Working Areas

EP Minerals has plans to develop additional mining areas near the existing mine workings. Preliminary mine designs have been completed for the North Kelly Field area (located in Section 19 Township 19S Range 37EWM in Malheur County), Section 25 (located in Section 25, Township 19S, Range 36EWM in Harney County) as well as the Eagle Mine (located in Section 27 Township 19S Range 36EWM in Harney County). The immediate focus of new mining activity will be to develop the area known as Hidden Valley.

Hidden Valley is located in the eastern half of Section 34 Township 19S Range 36EWM; it lies directly east of the current Beede Desert pit, and west of the Section 36 working areas. The ore deposit located within this small valley runs along a North-South axis, and is believed to have very similar properties to the Beede Desert deposit. Hidden Valley has as an approximate mine life of 10 to 20 years depending on market demand for these products, and the economic pit limit. Additional drilling and processing testing is needed to define the latter.[8] Hidden Valley is composed of ore deposits that are highly oxidized and relatively free of contaminants.

As with all operations in the Celatom Mining Complex, topsoil will be removed and stockpiled for reclamation purposes, mine and plant mineral process waste will be deposited in properly designed waste stockpiles and ore will be excavated and stockpiled for use at the processing facility.

2.6 Products Produced from Diatomite Ore

A multitude of products are produced from the ores mined from the Celatom Mining Complex; but before the diatomite becomes a product, it must be processed. In processing, the crude ore is crushed, milled, dried, calcined, and classified in order to produce a variety of natural mineral products. These products are then primarily sold into the filtration, filler, and aggregates markets. Food grade products sold into the filtration markets are used extensively to filter out contaminants from fruit juices, wine,

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[7] Appendix articles 12, 13, 21, and 22 for aerial photographs showing both Section 36 and Kelly Field.

[8] Appendix articles 14 and 23 for the location and operating area of Hidden Valley. Also the claims map in article 5 which illustrates all claims currently held by EP Minerals in the Celatom Mining Complex and the associated operating boundaries.

beer, sugar, bio-diesel fuel, high fructose corn syrup, and water. Products sold as fillers are used primarily as an additive in paints, rubber, paper, and plastics. Aggregate products are used primarily as industrial absorbents, catalysts, and carriers for pesticides.
The diatomite ore produced from the Celatom mine and subsequently processed at the plant is sold to these and other markets throughout the world. Product shipment occurs 7 days per week via railcar, inter-modal containers, and over-the-road trucks.[9]

3.0 Mining Activities

Modern mining operations are much more complex than the stereotypical vision of miners using picks and shovels in dimly lit underground workings. There are many safety, environmental, operational, and efficiency issues that must be recognized, planned for, and dealt with in an ethical and practical manner. In the following section, all of the primary operating issues will be identified and addressed. Moreover, details of each operating area within the Celatom Mining Complex will be discussed in more detail.

3.1 Period of Operations

The Celatom mine typically operates seasonally with mining activity normally starting in early spring, and concluding sometime in the late fall when either sufficient ore has been stockpiled, or when inclement weather makes mining too costly or difficult. During a typical year, the mine will operate for an average of 184 days. The April to November timeframe provides optimum working conditions; moreover, the dry hot weather aids the natural drying of the ore in the stockpiles. Mining rarely takes place during winter months due to adverse weather conditions which makes mining too costly to undertake. At this time, EP Minerals does not anticipate mining on a year-round basis; however, if market conditions exceed the mine's ability to supply, it is possible that a year-round mining program could be implemented.

3.2 Mine Camp

Due to the remote location of the Celatom Mining Complex, and the fact that most of the employees who work there live near Ontario or Vale Oregon, EP Minerals constructed and maintains a mine camp for the mine employees. This camp is located in the SW ¼ of Section 36. The mine camp contains a generator building, water tank, shower house, septic system, and during the operating months, multiple camp trailers. Mine operations utilize two crews working twelve-hour days, four days per week, throughout the mining season. The crew that is working resides in the camp trailers for the course of their rotation. As the needs of the Celatom mine changes so will the number, size, and schedule of the mine crews.

3.3 Mine Power Supply

[9] Appendix article 43 showing a few of the finished products

Every mine site requires electricity to operate tools, machinery, and to provide lighting, and since there is no commercial power available at the mine, all electricity must be generated on site. Three diesel-powered generators are used to provide power to the mine shop area, the mine camp, and the Beede Desert water well. In the mine shop area, electricity is used to power air compressors, welders, and other assorted mine support equipment. In the mine camp, electricity is used primarily for refrigeration and lighting. In the mine area, electricity is used to operate two water pumps which supply water for dust suppression and for toilet facilities. Generators are normally located in small generator buildings or on portable trailers; diesel fuel used to power the generators is stored in tanks with secondary containment. Generators are operated on an as-needed basis.[10]

3.4 Mine Water Supply

Water has many purposes at the mine with the two primary uses being dust suppression and personal hygiene. Water is pumped from two wells at the Celatom Mining Complex. The first well was installed in 1985 and is located in the SE ¼ SE ¼ Section 3 Township 20S Range 36 EWM; this well supplies water primarily for dust suppression. The second well was installed in 1999 and is located near the mine shop in the SE ¼, SW ¼ of Section 36; this well pumps water to a nearby storage tank, and provides water for both the mine camp, and for dust suppression. Water from the Artesian well PZ-3 is also used for dust suppression as well.[11]

Water is normally not drawn from both wells at the same time; however, as mining operations begin in Hidden Valley, and reclamation activities take place at Beede Desert, both water wells will be used concurrently. In addition to supplying the needs of the mining operations, EP Minerals has historically also provided water to local ranchers for their cattle during times of drought at no cost. EP Minerals will continue assisting its neighbors when possible.

It is also important to state that under, "DECISION RECORD/RATIONALE EA-OR-020-5-2 1984, Eagle Picher Plan of Operations Decision Paragraph B Subsection (2)", which states: "*Eagle-Picher shall design and construct a reservoir in T.20S., R.36E., W.M. Section 25: NW. ¼, SW. ¼ in the 3C's pasture of the Chalk Hills allotment, at a site to be selected by the BLM. This shall serve as the sole reservoir for the pasture, replacing use of the existing reservoir in the Chimney Creek pasture and drawing cattle away from the main haul road. Gates in the fence along the western boundary of the CC reservoir shall remain closed while either the 3C's or the Chimney Creek pastures are in use*." In lieu of constructing this reservoir, the BLM requested that Eagle Picher drill a well in the said location -this was completed.[12]

3.5 Exploratory, Developmental, and Production Drilling

[10] Appendix article 25 for photograph of generator shed
[11] Appendix article 26 for well permits
[12] Appendix article 27 for the location of water wells.

Three types of drilling occur at the Celatom Mining Complex, they are exploratory, developmental, and production. Each type of drilling provides specific information for a particular need of the mine operator. EP Minerals maintains an active drilling program which supports mine planning activities; mine planning is necessary to ensure that mining is sequenced properly in order to supply markets with the required ore blends, and to maximize mine efficiency while minimizing costs.

3.5.1 Exploratory Drilling

Exploratory drilling is normally the first step towards identifying an ore deposit and is normally set up in a large grid pattern (typically on 1000 foot centers) with drill hole spacing influenced by geologic and/or topographical conditions. Drilling methods include diamond core drilling, rotary drilling, and percussion drilling. Drill-hole depth can depend upon either the extent of the ore deposit, or other factors, such as: basal rock determination, structural geology, or intercepting a marker structure, however the usual range is 100-500 feet in depth. If exploratory drilling indicates that there was a good potential to be economic, then additional drilling (developmental) is required to further define the ore body.

Exploratory drilling typically occurs from April until November but may occur year-round, and reclamation of drill sites and access roads is performed during the fall of that drilling season, weather permitting. A typical exploratory drilling session involves 1 drilling rig and 2 support vehicles (pickup trucks); this equipment is typically staffed with 3 personnel. Each exploratory hole takes approximately 1-3 days to develop depending on geological and meteorological conditions.

Exploratory drilling began in the Celatom mine area in the late 1970's in order to determine the size of a diatomite mineral deposit that had visible surface outcrops; once the existence of a significant deposit was found, additional drilling was conducted to further delineate the size and quality of the diatomite deposit. However, despite over 20-years of active mining, additional exploratory drilling is still required in and around the Celatom mine complex due to reserve depletion and changing market conditions. Historically exploratory drill holes were typically located outside the MPO boundaries; however, all exploration activities will now occur within the new MPO boundary. For this reason, exploration holes require reclamation and bonding by the state. During reclamation the utilization of mechanized equipment is limited, drill sites are normally reclaimed by utilizing hands tools (i.e. garden rake, broadcast spreader, shovel). All exploratory drilling on federal lands will be bonded through the MPO and covered by the MPO exploratory drilling boundary.

Historically, exploratory drilling at the Celatom mine has been accomplished by the use of a rotary drill, drilling 3.5-inch diameter holes to determine the existence, quality and depth of the ore. However, core drilling occurred during 2008 to allow better analysis and inspection of the in-situ ore (a recent addition). The new drill will allow the retrieval of 2.5-inch diameter core which will be used to interpret structure, ore composition,

waste intercepts, and partially consumed to test the quality of the ore drilled. Both of these drills are mobile, but require the construction of an unimproved roadway before the drill rigs can be mobilized to the drill site. A bull dozer and motor grader are utilized in the construction of these roads. Drill pads and drill roads will be constructed along topographical features to minimize unnecessary disturbance of local ecology. The drill site is approximately 10 feet wide and 20 feet long; however, oftentimes the drill site has to be leveled with a dozer (if on a hill side). After the hole has been drilled, the hole is plugged with a conical concrete plug and back-filled with drill cuttings.[13] In the event that water is encountered in an exploratory hole, DOGAMI backfill guidelines would be utilized. The drill site and access roads are then seeded with a BLM approved seed mix. Normally heavy equipment is not utilized in the drill site or drill road reclamation process as it would cause more disturbance than it would repair. Reclamation typically involves hand tools and small hand-held broadcast seed spreaders.

Before any exploratory drilling occurs on BLM lands, the BLM Burns office will first be presented with an appropriate drilling plan; this plan will inform the BLM and DOGAMI of EP Minerals intent to drill within the 2008 MPO boundary. The drilling plan will inform the BLM and DOGAMI of the location of the proposed drill holes, any required access routes to the holes, and a plan to reclaim the area once the drilling has been completed. Once permission is given the drilling will occur. Please note that all exploratory drilling will be covered under one bond. All exploratory drill holes are sealed in accordance with DOGAMI drill hole abatement procedures. EP Minerals holds an exploratory drilling permit covering Townships 19S & 20S in Ranges 35, 36, and 37EWM[14]. Exploratory drilling will occur within the 2008 Celatom MPO boundary line.[15] Each year a minimum of ten and no more than fifty exploratory drill holes will be drilled within the 2008 MPO Boundary. Each of these holes will be a minimum of 100 feet deep and could reach depths of 500 feet or more. When drilling mud is required it will be contained in a sealed tank on a drill support truck. “Drilling mud ponds” will not be utilized. When drilling is completed the drill fluids will be placed into one of the sediment basins.

3.5.2 Developmental Drilling

Developmental drilling occurs nearly every year shortly before the start of mining operations. Development drilling only occurs inside or adjacent to the current pit limits; therefore, development drilling will occur in one of the operating areas. This type of drilling normally requires the use of holes placed on a tight grid pattern with hole spacing rarely exceeding twenty feet. Developmental drilling is done to confirm ore quality in an area before the area is mined. Due to the relative shallowness of developmental drill holes, the entire hole is normally mined out by the completion of the mining season; consequently, these holes are not capped but are backfilled with the drill cuttings. Backfilling the holes negate the hazard that an open hole could pose to

[13] Appendix article 36 for DOGAMI drill hole abatement procedures. Appendix article 37 also contains EP Minerals current exploratory drilling permit.
[14] Appendix article 37 DOGAMI Exploration permit
[15] Appendix article 4 for location of the line

livestock or wildlife moving through the mine area. Each year a minimum of 20 and a maximum of 100 development drill holes will be drilled at the Celatom Mining complex. Development drill holes will be a minimum of 20 feet deep and a maximum of 200 feet deep.

3.5.3 Production Drilling

Production drilling involves drilling a very tight pattern of holes in benches where excavation is either on-going or planned. Production drill holes are shallow in depth and rarely exceed the height of the bench in which they are drilled (10 to 15 feet). The spacing of these holes will be dependant upon the geology and quality variability of the ore in that area. Production drill holes are drilled with hand-held or pick-up truck sized drill units that are highly mobile. The data collected from these holes are used to complete an ore grade cut sheet used by mine employees to properly mine and stockpile ore according to grade. As these holes are always excavated shortly after they are completed, capping or backfilling is not required; this is because the hole size is relatively small, and as a result, the open holes do not pose a hazard to livestock or wildlife moving through the mine area. Each year hundreds of production drill holes will be drilled and excavated at the Celatom Mining Complex.

3.6 Bulk Sampling

Once drilling has indicated a sufficient quality and quantity of potential ore is present, a bulk sample of this material must be excavated and ran through the process to verify that it can, in fact, make the products that markets demand. This is a vital and necessary step within exploration to ensure the deposit's characteristics are well understood prior to the outlay of additional resources.

Usually this is accomplished by first removing the topsoil and placing the material near by, then removing the overburden with either dozers or an excavator. Once an ore area has been sufficiently stripped and the top of the ore is exposed, an excavator is then used to cut a trench approximately 20 to 25 feet deep, and 10 to 15 feet wide. This material is placed on a leveled ore pad nearby.

The length of the trench is usually determined by the number of geologic anomalies present, and the complexity of physical properties that the DE exhibits. In some cases, multiple trenches are required to fully understand the processing requirements of a deposit for one or more ore types. In many cases, bulk sampling is limited to less than 1000 tons, but more volume may need to be extracted if issues arise from processing.

After the sample is collected and the geology is mapped, the trench will be backfilled with the overburden, contoured to approximately 3:1, then covered with topsoil and re-vegetated.

3.7 Mining Method

All of the mining operations at the Celatom Mine are surface mining operations. Surface mining accounts for 85% of all mining in the United States (Hartman 1987). More specifically, each working area or “pit” is an open-pit mine. Open pit mining is characterized by surface workings that vary in both width and depth depending on the geology and the mechanical properties of the ore being mined or the properties of the surrounding host rock. An open pit mine consists of multiple benches that are connected by ramps. Each bench will be referred to by its elevation. For example a working bench that is 3450 feet above sea level will be called the “3450” Bench. The established bench height for a pit is determined by matching geologic, ore grade, equipment, or other conditions. Once the prospecting and exploration phases have been completed, a mineral deposit enters into the development phase, and if a mineral can be economically processed and sold, the mineral deposit then becomes an ore deposit and it enters into the mining phase. The mining phase is the longest phase in the life of an ore deposit, and after the ore body has been mined to its economic limit, it enters into the last phase of mining which is the reclamation stage.

The Celatom mine complex is currently in the mining phase although there is concurrent exploration in order to replace and expand the reserve base. In the mining phase, there are essentially three steps to mining: 1) the removal and stockpiling of overburden for later use as a surface covering for reclamation purposes, 2) the mining and stockpiling of ore, and 3) the removal and stockpiling of any waste that was encountered during the ore mining process. Mine waste is stockpiled in areas outside of the planned pit areas or back-filled into pit areas that have been mined out. Since the bulk of the materials excavated are ore, there will be an open pit after mining has ceased. Reclamation in this instance will involve slope reduction and contouring combined with seeding; however, the end result will be a remnant of a pit. Typically, all mines in the Celatom Mine complex follow this simple mine process; however, there is an exception, and it is the Beede Desert mine area which utilizes a mining method called contour mining. In this method, once the ore has been extracted, the pit excavations are then backfilled with a combination of mine waste and mineral process waste to an elevation approximating the original topography. The shallow nature of the Beede Desert ore deposits lends itself to this mining method. In contrast, the deeper and more extensive ore deposits in the Kelly Field and Section 36 areas lend themselves to open pit mining.

3.8 Quality Assurance Plans

Ensuring that mining activities occur in an efficient, systematic, and safe manner requires that the mine operator have good mine plans and that those plans are coordinated with the mine employees. Mine plans include approximate pit limits, the design of haulage ways, the location of waste stockpiles and the location of ore stockpiles and topsoil piles. It is important to mention that as mines develop the mine plans will change to account for geologic and economic conditions. Moving forward EP Minerals will incorporate several actions into the administrative process to ensure that operating boundaries and claim boundaries are not crossed. All operating boundaries,

for each operating area, will be clearly marked in the field with posts and flagging per DOGAMI's request. These boundaries will be surveyed based upon the same maps and boundary lines approved in this MPO. The toe of waste stockpiles located outside of pits will be surveyed and the waste stockpile will be constructed with an average slope of 3:1 thereby ensuring that the stockpile meets DOGAMI reclamation standards and that it does not extend outside of its planned area. When waste is backfilled into a pit, back filling will continue until either a level surface remains or the area can be re-contoured. Meetings and close coordination between the mine manager and mine crew chiefs ensure mine excavations advance as planned. Monthly meetings between mine crew chiefs and mine management ensure good communication between all mine employees.

3.9 Mine Roadways

The Celatom Mining Complex requires numerous roadways with varying construction to facilitate access to and throughout its operations. Mining equipment must be able to travel safely and efficiently throughout the operation; moreover, the entire operation must be accessible by over-the-road vehicles. The majority of roadways located within, or running through, the mining operations can be identified as either improved roadways, or mine haulage roadways. The improved roadways are used to access the mine from outside its boundaries; whereas, the mine haulage roadways are used by the mine operator to facilitate the mining process. Both types of roadways play a vital role in the operation. In an attempt to minimize the amount of disturbance, the Celatom Mining Complex will continue to utilize existing roads where feasible and will construct new roads when existing roadways can not reach working areas or when there is a concern for public safety.

3.9.1 Access and Improved Roadways

Economic, effective, and reliable access to the Celatom Mining Complex is required throughout the year. In order to meet this requirement, EP Minerals constructed or upgraded a total of 13.2 miles of road; this included improving 6.7 miles of pre-existing county roadways (located on public lands), and constructing approximately 2.5 miles of new roadway (also located on public lands). The construction and upgrade of the access roadways either met or exceeded Harney County's specifications as they existed in 1984.[16] However, where the improved roadway intersects U.S Highway 20, the road approaches were constructed in accordance with the Oregon State Highway Department standards and specifications[17] All culverts emplaced along or under the necessary improved roadways were designed based upon a 100-year storm event.[18]

In 1990, through a joint venture with Harney County, 6.4 miles of County Road 303, extending north from U.S. Highway 20 to the Beulah turnoff was paved with asphalt; moreover, a one mile paved extension was later added from the Beulah reservoir turnoff

[16] Appendix article 33 for the Harney County roadway specifications
[17] Appendix article 33 for Oregon State Highway specifications
[18] Appendix article 33 for culvert sizing calculations

to the Section 36 staging area making the total paved distance 7.4 miles. As a result of the initial joint venture, road maintenance for the paved road has been a collaborative effort between EP Minerals, a subcontractor, and Harney County.

The Celatom Mining complex has a number of access roads that are either closed to the public or have restricted access. The unimproved roads that access both the Beede Desert & Mill Gulch areas are closed to the public for safety reasons; the safety road closure was the result of recommendations made from a 1985 environmental analysis. Additional road access restrictions exist on roads that go through active mining areas (such as the existing road north of the Kelly Field pit); these roads remain accessible only to BLM personnel and local ranchers with grazing rights in the area.

The roadways accessing the Celatom Mining Complex cross multiple fence lines. Where required, heavy duty U-80 design cattle guards were installed using concrete piers for anchorage. A total of seven cattle guards were installed along the various improved roadways. Any pre-existing light-weight cattle guards were replaced with the U-80 cattle guards; EP Minerals returned the light-weight guards to the BLM[19].

The mine expansion will require the construction of two new roadways. In addition, EPM plans to reconnect Hart Road (the portion that slumped into the Kelly Field open pit) to Mill Gulch Access Road in the Kelly Field Mine Operations Area once pit wall stabilization is complete. This will be an unimproved road. The first roadway will be a connector road between Section 36 mining area and Hidden Valley and will be used exclusively by EP Minerals. The second road will be a new roadway used to access the Hidden Valley and Eagle operations. It is important to note that these roads will be constructed as needed and therefore construction may be several years in the future. The proposed route of each of these roads has been mapped and reviewed by the BLM. These roadways will conform to BLM roadway specifications where terrain allows. The BLM and a licensed Professional Engineer will be consulted before construction of these roadways is initiated.

At the section line of Section 30 (Kelly Field) and Section 19 (North Kelly Field) the Mill Gulch roadway crosses the Mill Gulch creek. When mining progresses into North Kelly Field, this pre-existing BLM crossing will be upgraded from the current 3’ diameter x 26’ long culvert to a 4’diameter x 72’ long culvert. This will allow mining equipment to safely cross the Mill Gulch drainage.

The first roadway will be new construction and will be required to access the Hidden Valley operation from the Section 36 mine area. This new roadway is an unimproved roadway as it will be used by mine equipment only; and as such, it will not follow Harney County specifications. Moreover, this new road will dead end at the Hidden Valley mine site.

The second roadway is necessary to access the Hidden Valley mine site and will also be new construction; because this road will be used by ore haul contractors in order to

[19] Appendix article 34 for the U-80 cattle guard specification

access the Hidden Valley mine ore stockpiles, it will need to be an improved road. When the Eagle Mine becomes operational this roadway will be extended north into Section 27 thereby allowing access to the north side of the Eagle Mine operating area. Although these roadways are located in both Harney & Malheur counties, EP Minerals will use the BLM road specifications to design & construct all improved roadways.[20] It is imperative to state that all roadways constructed, other than mine haulage ways, will be constructed along topographic features. This acts to both minimize the impacts of road construction and limit the volume of material which must be moved to construct the roadway. Road cuts will be minimized keeping excavations under three feet whenever possible. In the event a road cut must exceed three feet EP Minerals will work with DOGAMI and the BLM to determine the best possible roadway design and construction.

3.9.2 Mine Haul Roads

Every working area of the Celatom Mining Complex contains numerous mine haul roads which are classed as "unimproved" roadways, and as such, these roadways are not constructed to any local or state roadway specifications. These roadways are not intended for public travel, and as a result, public access is prohibited. All mine haulage roadways are constructed in compliance with the Mine Safety and Health Administration regulations under 30 CFR.[21] Mine haulage roadways have road grades ranging from 0 to 15 percent, and road travel widths varying between a minimum of 25 feet and a maximum of 100 feet. Mine roadways are only maintained for use when mining is in progress in that particular working area. Roadway maintenance includes leveling with either a bull dozer or motor grader, and watering with a water truck (to control the generation of fugitive dust). Mine roadways will be reclaimed when mining activities have concluded unless they are emplaced in a final pit wall.

3.10 Ore Stockpiling and Haulage

The Celatom Mining Complex typically operates seasonally; however, the processing plant operates to meet market demand which typically requires around the clock operations throughout the year. As a result of these operational differences, mined ore has to proceed at a higher production rate, and must be stored in stockpiles for later plant use. These stockpiles are constructed based upon the grade of the ore, and the particular needs of the plant. All mined-ore stockpiles are located within the area that they are mined. For example, ore mined from the Kelly Field mine will be stockpiled in Kelly Field area - not in the Section 36 area; this is done to minimize haulage costs for the mine operator. The material in the stockpiles is subsequently loaded into over the road trucks and transported to the plant by a sub-contractor of EP Minerals. Ore haulage activities occur 365 days per year approximately 24 hours per day. The stockpiling areas are designed with appropriate drainage and storm water control measures around each stockpile pad to control runoff. In order to control fugitive dust,

[20] Appendix article 4, 11, 13, 14, and 16 for the road locations.
[21] Appendix article 35 for applicable MSHA haulage-way regulations.

trucks used to haul ore to the plant remain tarped for dust control and also adhere to posted speed limits while within the mine sites.[22]

3.11 Waste Stockpiles

Waste stockpiles are located at each of the working areas within the Celatom Mining complex and contain wastes generated from two different sources. The first waste material is generated while mining and is called "mine waste" which is inter-bedded with the ore. Mine waste is typically composed of three different materials: 1) Diatomite that did not meet quality specifications, 2) Non-diatomite material found within the ore body such as clay and volcanic ash, or 3) Non soil overburden material such as rocks and mudstone.

The second waste material is generated by the plant during processing of the ore and is termed, "mineral process waste"; it is typically a combination of DE, fine particles of rock (basalt), volcanic ash, minor amounts of pyrite, clay, soda ash and other contaminants found within the ore body. Mineral process waste is backhauled to the mine and deposited in the waste stockpiles located within the various mine areas. However, in order to minimize the transportation of metals from mineral process waste due to leaching by meteoric waters, mineral process waste will not be stockpiled at a point below the static water table of a pit to be backfilled.

Historically, the static water table is defined as ground water pooling in the bottom of a pit that is not meteoric in origin, does not evaporate and recharges. If mining advances below the static water table in the existing Section 36 and Kelly Field pits, mine waste will be used first to backfill the pit to a level well above the static water table, then mineral process waste and mine waste will be stockpiled in the pit.
There is at least one waste stockpile located in every working area of the Celatom Mining Complex; however, Section 36 and Kelly Field each have two waste stockpiles with Kelly Field adding a third waste stockpile in 2008. Currently all mineral process waste is hauled to the Beede Desert waste stockpile; however, once the EIS has been approved, plant mineral process waste will be deposited in the Hidden Valley waste rock pile.[23] The lack of groundwater and the limited quantity of storm-water runoff make Beede Desert , Eagle, and Hidden Valley ideal locations for depositing mineral process waste.

Historically, the slopes of the sidewalls of the waste stockpiles were constructed at the angle of repose of the waste material which permitted their prompt and economic construction. However, due to DOGAMI reclamation standards (which require the slopes to average 3:1 or less), many of the earlier waste stockpiles will require extensive dozing when reclamation occurs to reduce slope angles to meet the DOGAMI standard. Consequently, all future waste stockpiles will be constructed in such a fashion as to have an overall side slope averaging 3:1 thereby meeting the DOGAMI reclamation standards for final slopes. In the event that terrain, operational, or other

[22] Appendix article 39 for photographs showing an ore truck being loaded with stockpiled ore.
Needs #23

circumstances prevent the waste stockpile slope angles from averaging 3:1 or less, EP Minerals will seek approval for a modified final slope angle from DOGAMI. Waste backfilled into a dry pit will not maintain the 3:1 standard.

3.12 Mine Equipment

The Celatom Mining Complex utilizes multiple types of mining and ancillary equipment. This equipment is commonly used in the open-pit mining and heavy construction industries. The primary equipment utilized for ore extraction, mine waste removal, and overburden removal will be a combination of articulated haul trucks being loaded by a mining shovel or excavator. A truck and shovel fleet provides lower unit cost operations while maintaining a high degree of operational flexibility. The size and number of the truck and shovel fleet will depend upon the ore requirements for that mining season.

As the size of the Celatom mine changes, so will the production fleet deployed. Support equipment directly engaged in mining at the Celatom mine includes scrapers and a bulldozer. Although rarely used in a production role, scrapers are an excellent machine for removing thin layers of soil or other weak material or when reclaiming with topsoil. The bulldozer has an innumerable number of duties at every mine site and includes, but is not limited to, road construction, reclamation, stockpile leveling, soil removal, and ripping. A dozer will be deployed at the Celatom mine for the foreseeable future.

Ancillary equipment currently deployed at the Celatom mine includes a service truck, motor grader, water truck, rotary air drill, and pick-up trucks. As the needs of the mine operations change, or the technology of mine equipment evolves, so will the equipment that is deployed at the mine.[24] Equipment changes will have little if any effect on the location of mine workings, stockpiles, waste stockpiles, and stockpiles. Equipment is selected to fit the needs of the mining operation; the mine operations will not be modified to fit the needs of the equipment.

3.13 Permitted Operating Areas

EP Minerals holds operating permits with DOGAMI for all active mining areas.[25] All mining activities occurring on BLM managed public lands are done so within the boundaries of the operating permits for the Kelly Field and Beede Desert pits. Due to the highwall failure, and the associated remediation activities, the operating permit boundary for the Kelly Field pit must be redefined. Furthermore the operating permit boundary for the Hidden Valley, North Kelly Field, Eagle and Section 25 mines will also be defined.

The operating permit boundary for the Kelly Field pit currently does not extend far enough East to allow the slide remediation activities to occur. Therefore, EP Minerals requires that the following areas be included within the confines of the Kelly Field

[24] Appendix article 40 contains photographs of some of the equipment currently deployed at the Celatom
[25] Appendix article 44 for current copies of all DOGAMI operating permits held by EP Minerals.

operating permit areas: all of Section 30 Township 19S Range 37EWM. Please note that some of this section is comprised of private land owned by EP Minerals and private land owned by a third party.[26]

The operating area required for the Hidden Valley pit will run along a North-South axis on the Eastern edge of Section 34 Township 19S Range 36EWM; however it will not be limited to Section 34. Hidden Valley will require all of the following areas to be permitted for mining operations on public land. In Section 34 the following areas will be included in the operating area: The NE ¼ of the NE ¼, the SE ¼ of the NE ¼, the NE ¼ of the SE 1/4 , the SE ¼ of the SE ¼, the NE ¼ of the NW ¼ of the NE ¼, the SE ¼ of the NW ¼ of the NE ¼, the NE ¼ of the SW ¼ of the NE ¼, the SE ¼ of the SW ¼ of the NE ¼, the NE ¼ of the NW ¼ of the SE ¼, the SE ¼ of the NW ¼ of the SE ¼, the NE ¼ of the SW ¼ of the SE ¼, and the SE ¼ of the SW ¼ of the SE ¼. In Section 3 Township 20S Range 36EWM the NE ¼ of the NW ¼ of the NE ¼, the SE ¼ of the NW ¼ of the NE ¼, the NW ¼ of the NE ¼ of the NE ¼, and the NE ¼ of the NE ¼ of the NE ¼.[27]

4.0 Spill Contingency Plan

4.1 Fuel and Oil Storage Areas and Spill Prevention and Control

The Celatom Mining Complex has one central fuel island where off-roadway diesel and gasoline are stored. Both the gasoline and diesel fuel tanks are located inside a concrete containment basin which is capable of holding the contents of both tanks in the event of a tank rupture. This central fuel island is located near the mine shop in the SW ¼ of Section 36 Township 19S Range 36EWM. Located adjacent to the mine shop in Section 36, is an additional concrete containment basin where lubrication, hydraulic, and waste oils are stored. This containment also has sufficient capacity to hold the contents of all of the tanks in the event of a tank rupture. Moreover, the remote generators have individual fuel tanks with separate containment structures to prevent fuel from either contacting the ground, or contaminating the groundwater. Finally, the service truck which is used to fuel and service the mine machinery is equipped with a double-lined 500 gallon diesel tank; this tank is inspected regularly to ensure it is in proper working condition.

As mining operations continue, it may be necessary to install additional fuel and oil storage facilities; if this occurs, EP Minerals will do so in accordance with all applicable laws, and will also modify the MPO as required.
In the event of a fuel or oil spill at the mine, EP Minerals would make every effort to contain the spill as rapidly as possible, in order to prevent any spilled material from

[26] Appendix article 4 and 13 of map showing the new operating permit boundary for Section 30 Township 19S Range 37EWM known as the Kelly Field mine.
[27] Appendix article 14 is of the map outlining the operation area of Hidden Valley. Also the claims map in article 5 which illustrates all claims currently held by EP Minerals in the Celatom Mining Complex and the associated operating boundaries.

reaching areas outside the containment. Moreover, any required regulatory agencies would also be promptly notified. In case of a spill of petroleum based product, DE ore would be used to absorb any spilled material as it possesses excellent absorbent properties; once the DE had absorbed the spill, it would be gathered up and transported to the plant to be incinerated in the rotary kilns.[28]

5.0 Water Management Plans

5.1 Storm Water Runoff Control

Preventing turbid storm water runoff from leaving the Celatom Mine Complex is a priority of EP Minerals. In all of the current mine workings, a series of surface water drainage ditches exist to channel storm water runoff or pit water into multiple sediment basins. These drainage and interceptor ditches are similar to ditches commonly found along rural roadways having a depth of 1 to 2 feet and a width of 4 to 12 feet, depending on surface topography. The sediment basins are located throughout the working areas of Beede Desert, Section 36, and Kelly Field. The sediment basins and drainage ditches are designed to hold the runoff generated by a 100-year event. For the most part, these basins are evaporative sediment basins, the majority of the storm water collected in these basins evaporates, but a small amount of the water may also be absorbed into the ground. The basins located at our Beede Desert facility are also evaporative sediment basins, and therefore do not discharge into the watershed towards Altnow Pond. These basins capture all surface water runoff from all of the working areas including waste stockpiles, roadways, and open pits. As new areas are mined, or if current operational areas are expanded, ditches and/or sediment basins will be constructed to capture all storm water run off. The sediments that accumulate in these basins will be removed as needed, and either deposited in the nearest waste stockpile, or used for reclamation purposes.[29]

5.2 Pit Dewatering

The relatively arid climate found in the Celatom Mine area rarely produces sufficient rainfall to require mine dewatering activities. However, after winters with above normal precipitation, it is occasionally necessary to pump water from the lowest levels of pits; but even after these events, mine dewatering has never been required at Beede Desert. When pumping is necessary to facilitate mining activities, all water pumped from the pits is channeled through storm water drainage ditches to the sediment basins; this prevents turbid pit water from reaching the Mill Gulch drainage ditch. When conditions allow, any accumulated water in the lower levels of the pits is allowed to evaporate. As new areas are mined, or when the current pits are expanded, pit dewatering may occur with more frequency; however, all mining activity will be constrained to ensure no water discharges out of the sediment basins into Mill Gulch. The pH of the pit and sediment basin water will be monitored as needed to ensure that values are between 5 and 7.5

[28] Appendix article 12 for the location of the fuel and lube islands. Photos of facilities found in appendix articles 28, 29, 30 and 31 for the Spill Prevention Containment and Control Plan.
[29] Appendix articles 20, 21, and 22 for the location of the current sediment basins.

(for pits that contain unoxidized ore. If the pH is below a standard unit of 5, then a sample of the water will be collected for chemical analysis. If necessary, corrective action will be taken. Corrective action may include but is not limited to water treatment with agricultural lime, dilution with well water, or treatment with soda ash.

6.0 Rock Characterization and Handling Plans

As stated in the Geologic Conditions section of this report, there are multiple types of diatomite ore present within the Celatom Mine Complex. Handling each of these ores, and constructing stockpiles and waste stockpiles appropriately is covered in detail in the Rock Characterization Report, which can be found in article 62 of the Appendix.

7.0 Dust Abatement Measures

The hot, dry, and often windy days of the summer, are conducive to the formation of fugitive dust; however, EP Minerals makes every effort to limit fugitive dust at the Celatom Mine and the Vines Hill Stockpile Area. EP Minerals' dust control plan utilizes a number of control methods which are specifically designed to minimize fugitive dust.[30]

7.1 Dust Generation

Fugitive dust can be generated at numerous locations throughout the Celatom Mining Complex. Operational activities which could result in the emission of fugitive dust are outlined below:

- Road dust generated from the operation of vehicles used to transport ore and waste materials, personnel, supplies, and equipment on site.
- Equipment-generated dust from clearing and grading of land during mining operations.
- Equipment generated dust from excavating, loading, unloading, and stockpiling of ore.
- Disposal of mine waste material in mine waste stockpiles.
- Fugitive dust generated during high wind events

7.2 Dust Abatement

Most of the operationally generated sources of fugitive dust emissions identified are controlled by simple measures. The Celatom mine uses both physical and operational controls to limit fugitive dust emissions. The various physical and operational controls are outlined below.

[30] Appendix article 32 for the Celatom Dust Control Plan

7.2.1 Physical Control Measures

The following items are physical controls used at the Celatom mine:

- Water trucks
- Gravel roadways
- Paved roadways
- Berms
- Speed limits
- Tarps on OTR (**O**ver **T**he **R**oad) trucks
- Surfactants or surface sealers

Physical controls are implemented as needed in all active working areas and unpaved roadways. When mining is underway at least one water truck will be operating for the sole purpose of dust abatement.

7.2.2 Operational Controls

Management practices that are designed and implemented to improve or supplement physical controls will be referred to as "operational controls." Operational controls include, but are not limited to, speed limits, loading practices, and suspending operations during high-wind events.

7.2.3 Control of Land Clearing Emissions

When land is cleared to facilitate mining activities it involves clearing any trees, large boulders, or other objects that would impede the mining process. This is usually done in small areas and is not cleared until shortly before mining begins. Dust generated during land clearing will be controlled by one or more of the following methods:

- Windbreaks (using natural tree cover as a windbreak).
- Water (deployed with water truck).

7.2.4 Control of Stockpile Emissions

The stockpiles, and activities that occur around them, can be a source of fugitive dust. Examples of how dust can be generated near stockpiles include:

- **O**ver **T**he **R**oad trucks (OTR) loading ore into the trailer using a front-end loader (ore contractor).
- OTR trucks approaching or departing from the stockpile area.
- Haul trucks driving onto and stockpiling freshly mined ore onto a stockpile.
- Wind erosion of a stockpile due to a storm event.

Stockpile dust emissions will be controlled by using one or more of the following controls:

- Water (applied by a water truck)
- Ore will be loaded on the down-wind side of the pile if possible.

- All OTR trucks will be tarped after loading.
- The speed of all vehicles traveling on or near a stockpile will be limited.
- Roadways leading to and from stockpiles will be graveled whenever possible.
- Mining operations will be suspended during high wind events.
- A dust control surfactant may be substituted in place of water in the loading areas around the stockpiles if required.

7.2.5 Control of Waste Disposal Area Dust Emissions

Waste stockpile locations are prone to the generation of fugitive dust. Dust can be generated in these areas from any of the following activities:

- OTR trucks stockpiling mineral process waste.
- Mine haul trucks stockpiling mine waste.
- Dozers pushing waste on the waste stockpile.
- Wind erosion due to storm events.
- Tertiary equipment traversing the waste stockpile.

One or more of the following control measures will be used to limit fugitive dust emissions from the waste stockpiles:

- Water (applied with the water truck).
- Blending of mine and mineral process waste (this is the pushing process).
- All mineral process waste loads hauled by OTR trucks will be tarped.
- The speed of vehicles traveling on a waste stockpile will be restricted.

7.2.6 Control of Roadway Dust Emissions

Mining equipment traversing haul and access roadways will generate dust. Sources of dust on mine roadways include, but are not limited to:

- OTR trucks hauling mineral process waste to waste stockpiles.
- OTR trucks accessing and hauling ore from ore stockpiles.
- Haul trucks hauling mine waste to waste stockpiles.
- Haul trucks hauling ore to stockpile areas.
- Tertiary equipment traversing mine roadways.
- Wind erosion from a storm event.

Fugitive dust generated from roadways and travel-ways will be controlled with one or more of the following measures:

- Water (applied with the water truck).
- Gravel (frequently used roadways will be graveled when practical).
- Pavement (the main road accessing the mine is paved).
- Surfactants (may be used in place of gravel or water).
- Speed limits (are in effect throughout the mine)

- Mining operations will be suspended during high wind events.

When both the operational and physical controls are implemented, fugitive dust can be successfully suppressed at the Celatom Mining Complex. As the mine operations expand, or new pits are created, the measures used to prevent and minimize fugitive dust will change to meet the demands of the new locations. EP Minerals will continue to experiment with surfactants, soil sealers, vegetation, windbreaks, and other dust abatement tools to improve our ability to manage fugitive dust.

8.0 Reclamation Plan

It is expected that ore mining activities in the Celatom Mining complex will require a total surface disturbance of approximately 2,354.9 acres (see table 3). The majority of this disturbance will be reclaimed; however, approximately 125 acres will not be reclaimed (pit walls).

Table 3: Celatom Mining Complex Disturbance Area

Mining Area	Status	Area Disturbed (acres)	Area Permitted (acres)
Kelly Field	Active	410	640
Section 36	Active	300	640
Beede Desert	Active	115	640
Hidden Valley	Proposed	275	320
Eagle	Proposed	286	360
Section 25	Proposed	185	640
North Kelly Field	Proposed	475	760
Vines Hill	Active	20	35
Puma	Active	8	15
Vines Hill Access Road		2.4	2.4
Conector Road between Hidden Valley and S36		6.5	6.5
Haul Road from Hidden Valley north to Eagle		7	7
Exploration Activities		200	8,611.5
Trenching and Bulk Sampling		50	
Total Surface Disturbance		2354.9	
Total Acreage Permitted			12,677.4

8.1 Reclamation Overview

The objective of EP Minerals is to minimize the environmental impacts of their mining operations in the Celatom Mining complex by using "**Best Management Practices".** In general, reclamation at the Celatom Mine is based upon the following considerations:

- Minimizing safety hazards to the public;
- Returning the land to productive use after reclamation;
- Reducing adverse visual impacts;
- Controlling soil erosion; and
- Ensuring no degradation of the waters of the State.

In view of these considerations, the plan is to return the land to a condition that is suitable habitat for cattle grazing and wildlife which was also the lands' primary use prior to mining. Once mining activity has ceased, access to open pits will be limited by the placement of berms, and/or fences while any remaining haul roads will be re-vegetated; the pits will be backfilled where practical and economically feasible with any remaining high walls left in place. Overburden stockpiles will be re-contoured to an average slope of 3:1 and re-vegetated. Constructed containment structures will be safely sloped and re-vegetated.

Any improved roadways on public lands would be transferred to the BLM, while improved roadways on other lands would be transferred to the county. Reclamation techniques developed on site will ensure successful re-vegetation of the reclaimed areas[31]. The seed mixture outlined in Table 4 has been used successfully and has demonstrated its effectiveness towards meeting the reclamation standards for closure[32]. Upon completion of part or all of the reclamation process, EP Minerals will notify the BLM regarding what areas have been completed, so that the BLM may inspect and release any reclaimed areas.

8.2 Drill-Hole Plugging

All exploratory drill holes drilled at or in support of the Celatom Mine complex will be capped in accordance with the DOGAMI drill hole abatement standards. There will basically be two types of exploratory drill holes, namely: wet holes, and dry holes. Wet holes are exploratory drill holes where groundwater is encountered and flows up to the surface (collar) elevation of the drill hole. At this time, no wet holes have been encountered during exploration drilling. However, in the event that a wet hole is encountered, it will be filled with cement slurry as required by DOGAMI. The wet hole will then be capped with a concreted plug; next, the surface will be covered with soil and reseeded with a BLM approved seed mix (see table 4). Currently, all exploratory drill holes drilled at the Celatom mine are dry holes. In a dry hole, little to no groundwater is encountered. All dry holes are backfilled with drill cuttings or bentonite and then capped with a concrete plug; the hole area is then covered with topsoil and reseeded. The methodology used to cap a drill hole will follow the DOGAMI drill hole abatement standards. In the event these standards change, so will the abatement method utilized by EP Minerals.[33]

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[31] Refer to the appendix articles 54 through 59 for the "2008 Celatom Reclamation Plans" for a detailed review of the reclamation process.
[32] Appendix article 45 for Reclamation test plot.
[33] Appendix article 36 for DOGAMI Drill hole abandonment procedure

8.3 Re-grading and Reshaping

An important step in the reclamation process, but prior to re-seeding, involves either the re-grading of disturbed areas or the reshaping of mine features. The purpose of reshaping mine features is to knit the post-mining area's topography into the surrounding topography in order to improve stability or to mitigate visual impacts. Reshaping will primarily involve the overburden piles, but may also involve haul roads, containment structures, or pit backfills. All remaining overburden stockpiles will be reshaped and sloped to an average slope of 3:1. The re-grading of disturbed areas is used to facilitate the placement of top soil by leveling out the surface; moreover, it is also used to control drainage so as to protect the soil and seed that will be layered on top.

Areas that will require re-grading include, but are not limited to: ore stockpile areas (including Vines Hill), haul roads, pit backfill areas, and the tops of overburden piles. Once the ground has been re-graded and reshaped, a layer of topsoil will be placed on top, with subsequent reseeding. Reshaping and re-grading will typically involve the use of a track dozer, a scraper, or a motor grader.

8.4 Mine Reclamation, with Pit Backfilling Information

There are several different types of waste materials that are generated during mining, and plant processing. The mine waste materials include inter-bedded waste (volcanic ash, volcanic tuff, opalite, and clay), very poor quality diatomite, and overburden. Disposal of the mine waste is typically accomplished in one of two ways: either by the construction of waste stockpiles, or by back filling mined-out pits. Both of these options have been successfully utilized in the past and will continue to be utilized in the future.

The processing of ore at the plant also yields a waste material termed, "mineral process waste"; this material is composed of clay, sand, basalt fragments, natural diatomite, and a fluxing agent (sodium carbonate $NaCO_3$).[34] Mineral process waste will only be used as backfill above the static water table. The Eagle, Hidden Valley, Beede Desert, Section 25, and North Kelly Field East pit will not be mined below the water table. If the North Kelly Field West pit is mined below the water table, the pit will have an engineered partial backfill that would still allow the pit to act as an evaporative sink so there would be no standing water on the surface of the backfill (i.e.backfilled to a point where evaporation would equal inflow). Groundwater would flow toward the open pit eliminating the potential for dissolved constituents to migrate into and impact the groundwater system. .

In addition, it is planned that the mined out pits in Hidden Valley will be back-filled first, as these areas give rise to very dry conditions, thereby making it a more desirable storage area for the plant mineral process waste. Whether the mineral process waste is backfilled in a pit above the static water table or in a pit without a static water table,

[34] Appendix article 60, SKR 2010 Characterization report

once the area is filled, a minimum of a 12-inch thick layer of either inter-bedded mine waste or overburden (soil) will be used to cover the top of the mineral process waste, thereby forming an effective liner.

In all situations, the backfilling operation is accomplished by the use of trucks, scrapers, dozers, or motor graders. Upon completion of backfilling, the surface will be re-graded, covered with available topsoil, and then re-vegetated using the recommended BLM seed mix.

8.5 Interim Reclamation

Occasionally, an ore haul truck may encounter hazardous conditions that result in a load of DE spilling off of the roadway. In this situation, the material will be cleaned up when safe access can be afforded by either mechanized or manual means. If the vegetation in the area was damaged by the spill and clean-up activities the area will then be broadcast seeded in the fall with a BLM approved seed mix.

8.6 Seeding & Topsoil Preparation

After the disturbed area has been prepared by either re-grading or reshaping, the area will be covered with a layer of topsoil and scarified to a depth of 2-6-inches. Scarifying and topsoil application will be the primary means of seedbed preparation. Scarification leaves a roughened surface which will provide greater opportunities for successful germination and re-vegetation. Scarification will be accomplished by use of a dozer (dozer grouser imprints work well and protect the seeds during germination), a grader with a scarifying blade, or an off-set disc. The benefits of a scarified surface include slower runoff, increased infiltration, colonization sites, and more favorable microclimates conducive to seed germination.

The Celatom Mine will use a BLM seed mixture for all reclamation seeding (recommended by Nora Taylor from the Burns BLM office in 2003 – see table 4). The Celatom Mine has used a variety of methods to apply the seed. Each of these methods has been successful in re-establishing native vegetation at various mine sites. These methods include the following:

- Hand-broadcasting.
- Broadcast seed with hand operated seeder.
- Range Drill
- Hydromulching seed and organic mulch.

Table 4: Typical Reclamation Seed Mix

SPECIES	PLS Lbs/Acre
Wyoming Big Sage	**.1**
Goldar or Secar Bluebunch Wheatgrass	**4.0**
Covar Sheep Fescue	**4.0**
Antelope Bitterbrush	**1.0**
Range Alfalfa	**1.0**
TOTAL = 10.1 Lbs/Acre	

In Section 19, where Ponderosa pine will be removed to facilitate mining, final reclamation would include seeding with one of the approved seed mixes. Ponderosa pines would not be planted as part of reclamation because the primary goals of rehabilitation are soil stabilization and control of noxious and invasive weeds.
By far the greatest barrier towards the successful re-vegetation efforts has been the lack of moisture. The vast majority of precipitation at the mine site occurs in the form of snowfall, thus fall seeding has been the most successful.

8.7 Riparian Mitigation

The Celatom mine area does not contain any significant streams or bodies of water; however, the Mill Gulch drainage does contain an intermittent stream which is dry most of the year, and flows only in response to precipitation resulting largely from snow melt. The Mill Gulch drainage is located in sections 18, 19, 30, 36, 1, 2, & 11 of T 19S, R 37E. There are two areas that may be classed as Riparian areas; they are located in the southern portion of Section 2. Due to the fragility and slow rebound of high desert riparian areas, any mining related activities are performed in such a way as to minimize unnecessary disturbance of the local ecology. BLM and DOGAMI will be consulted during the reclamation process regarding location and preservation of local ecology. In order to minimize impacts to these two Riparian areas, EP Minerals will utilize silt fences, diversion ditches, and gravel to preserve Riparian habitat.

Where crossings have been constructed in the Mill Gulch drainage the culverts will be removed and the banks of the drainage will be contoured to coincide with existing banks above and below the crossing. In the areas where vertical walled channels were cut, these vertical walls will be cut back to an average slope of 3:1. An excavator will be used for this task. Once re-contouring is complete, the area will be seeded with the BLM recommended seed mix.

8.8 Wildlife Habitat Rehabilitation

As reclamation progresses towards completion, the re-establishment of vegetation will provide additional forage for wintering deer and elk as well as cover for birds.

Fisheries habitat within the project area is negligible due to the small size and intermittent nature of the streams. The main fisheries habitat lies outside the project area in the Otis Creek and Malheur River basin. Water impoundments should also benefit wildlife in the area, particularly upland game birds, game animals and water fowl at least during part of the year. With the limited amount of precipitation and the high evaporation rate during the summer months, these impoundments are insufficient to maintain water for wildlife year round.

8.9 Isolation and Control of Acid-forming, Toxic or Deleterious Material

The material characterization of mine and waste material is summarized in the SRK 2010 report Appendix Article 60. Mine waste will be used to backfill the Section 36 and current Kelly Field open pits in the area below the static water table and mineral process waste/mine waste will only be used as backfill above the static water table. The Kelly Field expansion area, Hidden Valley and Eagle Mines as well as the East Pit of North Kelly Field have pit floor elevations above the water table. The absence of ground water (all monitoring wells in Hidden Valley are dry) makes Hidden Valley an ideal location for the backfill of mine waste (non-ore material) and mineral process waste (a combination of DE, fine particles of rock (basalt), volcanic ash, minor amounts of pyrite, clay, and soda ash). Lack of ground water in the Eagle mine Area and the limited quantity of storm water runoff make Eagle an ideal location for the backfill of mine and mineral process waste. The East Open Pit in North Kelly Field will not be mined below the water table making it suitable for backfilling with mine and mineral process waste. This will result in a final open pit in the western area of North Kelly Field. If mining advances below the water table in West pit of North Kelly Field, the pit would have an engineered partial backfill that would still allow the pit to act as an evaporative sink so there would be no standing water on the surface of the backfill (i.e. backfilled to a point where evaporation would equal inflow). Ground water would flow toward the open pit eliminating the potential for dissolved constituents to migrate into and impact the ground water system. Please reference the Appendix Article 60 “2010 SRK Monitoring Report”.

8.10 Removal or Stabilization of Buildings, Structures and Support Facilities

In Section 36, T.19S., R36E, all structures in the “staging area” will be removed including the maintenance shop building, petroleum storage facilities, generator house, office trailer, truck scale, water tank and all concrete pads and associated concrete spill containment structures. The buildings would only remain if a local municipality, state, or federal government request the buildings remain for their use. All gravel will be graded up and placed on top of the BLM road and crowned. The underlying soil will be scarified to a depth of 5 to 12 inches and seeded with the recommended BLM seed mix. At the mine camp, all surface structures including the change house, generator house and any associated concrete pads, foundations, or spill containment structures will be removed. All buried utilities will be taken out, the septic tanks will be pumped and backfilled with sand. All gravel will be graded up placed on top of the BLM road and

crowned. The under lying soil will be scarified to a depth of 2-6 inches and seeded with the recommended BLM mix.

The fence surrounding the topsoil stockpile that was initially used as a test plot will be removed at such time as the topsoil pile is used for reclamation. Once removed, the topsoil pad will be scarified to a depth of 2-6 inches and seeded with the BLM recommended seed mix.

In Section 3, T.20S., R36E, the only structure is the Beede Desert Well Site. The abandonment of the well is discussed under the water well section. The generator house, water tank, and associated pads, security fence and concrete spill containment structures will all be removed. The gravel will be graded up and placed on top of the BLM road and crowned. The underlying soil will be scarified to a depth of 2-6 inches and seeded with the BLM recommended seed mix.

The equipment required to reclaim the support facility sites include a backhoe, motor grader & trucks. Hydromulching seed and organic mulch may also be utilized.

At the other locations: Sections 33 & 34 T.19S., R36E. , Sections 30 & 19 T19S., R37E. & Section 24, T19S., R36 E. no structures exist.

8.11 Post-Closure Management

Following the cessation of mining, all efforts will be directed towards completing reclamation. Final grading, contouring, and re-vegetation will be completed. The remaining pits will be secured with berms and fencing where required. Drainage will be managed by use of diversion ditches which will be used to route storm water away from the reclaimed areas or from filling the pits and into settling basins. The settling basins for storm water management will be cleaned with the perimeter banks of the basins cut to an average slope of 3:1. The area will then be scarified to a depth of 2-6 inches and seeded with the BLM recommended seed mix.

Weather conditions at the mine site will allow reclamation work to take place only during 6 to 7 months a year. With this schedule it is estimated that reclamation will take three years to complete. Monitoring of the reclaimed mine site will consist of:

a.) Ensuring that the reclaimed site remains stable, with a focus on controlling erosion.
b.) Inspecting drainage ditches and catch basins to ensure that they are in good shape and remain effective. Repair or clean as necessary.
c.) Checking that vegetation is progressing as planned. Reseed areas where necessary.
d.) Check for ponding in the pit areas.
e.) Sampling of the monitoring wells annually for 5-years[35]

[35] Appendix article 60, 2010 SRK Monitoring Report for additional information on the groundwater monitoring

This monitoring is expected over a ten year period with on-site visits on a quarterly basis for the first three years and then annually thereafter.

9.0 Monitoring Plans

During the months that mining occurs, EP Minerals monitors the conditions of several different items at the Celatom Mining Complex. These include, but are not limited to, weather conditions (temperature, precipitation, wind speed, & humidity), ground water, ground conditions, and surface water. The type of monitoring performed and the frequency of monitoring is described in the following sections.

9.1 Type and Location of Monitoring Devices

Several types of monitoring devices are deployed within the Celatom Mining Complex. Each is described below.

9.1.1 Weather Monitoring

Weather monitoring only takes place during the mining season so there is limited precipitation, temperature, and wind data available. The type and location of monitoring devices used at the Celatom Mining Complex depends on the conditions which are being monitored. Weather conditions are monitored by two different weather stations. The stationary weather station is located at the equipment staging area in Section 36 Township 19S Range 36EWM[36]. This weather station monitors wind speed, air temperature, humidity, and precipitation. A second portable weather station is used to conduct wind surveys throughout the mine facility. Typical weather conditions constitute low temperatures in the 40's and highs in the upper 90's during the summer months. Winds are predominately out of the south west and vary from calm to in excess if 40 miles per hours during storm events. Usual wind speed is approximately 9 mph. Additional weather information is available from the National Weather Service.

9.1.2 Groundwater Monitoring

The condition of the groundwater is monitored by several groundwater monitoring wells currently in place within the Celatom Mining Complex. All groundwater monitoring wells used for the collection and analysis of groundwater were installed under the direct supervision of a qualified well installer licensed with the State of Oregon. All monitoring wells were constructed in accordance with Oregon water well standards and NEPA groundwater sampling well requirements.[37]

Groundwater monitoring wells are located in every active working area as well as Hidden Valley and North Kelly Field. Well MW-9 is located in Section 19 Township 19S Range 37EWM (North Kelly Field). Wells MW-8, MW-7s, and MW-7d are all located in Section 30 Township 19S Range 37EWM (Kelly Field). Wells MW-3, MW-4, MW-5, and

[36] Appendix article 12 for a map illustrating the location of weather station
[37] Appendix article 60, SRK 2010 Characterization report

MW-6 are located in Section 36 Township 19S Range 26EWM (Section 36). Wells MW-1 and MW-2 are both located in Section 34 Township 19S Range 36EWM (Hidden Valley). Neither MW-1 or MW-2 produced any water confirming suspicions that Hidden Valley is a dry valley. Wells MW-10A (abandoned) and MW-10B are located in Section 33 Township 19S Range 36EWM (Beede Desert). Finally well MW-11 is located in Section 27 Township 19S Range 36EWM (Eagle Mine). MW-11 produced no water thereby making it a dry well. Three additional monitoring wells or piezometers were installed after the initial well installations. MW-12 is located immediately adjacent to the Kelly Field pit in S30 Township19S Range 37EWM. PZ-4 is also near the pit in S30 T19S Range 37EWM. Finally PZ-5s was installed in Section 25 Township 19S Range 36 EWM. It is also important to mention that EP Minerals installed a number of test wells throughout the Celatom mining complex before the Monitoring wells were installed in 2005. These test wells are not used to monitor water quality but are used at times to monitor the elevation of the water table.

9.1.3 Ground Condition Monitoring

Ground conditions are monitored in working areas where there is either evidence of prior slope failures, or where there is a concern that slope stability may become an issue. Ground conditions are monitored by visual inspection which consists of looking for cracks, floor heave, loose material, etc., and by survey monitoring stations (MS) and prisms. Monitoring stations are surveyed when work is occurring near or on potentially unstable ground. A monitoring station is simply a survey stake (re-bar) driven into the ground and marked with a steel post and pvc pipe or flagging thereby making it clearly visible in the field. Extension-meters are also deployed where there is evidence of slope instability. Extension-meters are simply a metal steak connected to a weight. The movement of this weight is measured at regular intervals to monitor ground movement. In areas where highwalls have been created as part of the slope failure remediation process the highwall is monitored with prisms. These prisms are “shot” with a total station at regular intervals to insure the highway is not in motion. Please see Appendix article 61 for our highwall monitoring plan. (reference needed here) These stations will be removed when mining is completed.

9.1.4 Surface Water Monitoring

All storm-water runoff, and any water pumped from the mining pits, will continue to be collected in one of the many sediment basins located throughout the mining complex. The water in these sediment basins from the pits that contain unoxidized ore would be monitored for pH to ensure that values are between pH 5 and 7.5. If the pH is below a standard unit of 5 then a sample of the water would be collected for full chemical analysis, and corrective action would be taken in order to prevent potential contaminant release to groundwater. Corrective action could include, but would not be limited to, water treatment with agricultural lime, dilution with well water, or treatment with soda ash. No water would be discharged into Mill Gulch.

9.2 Sampling Parameters and Frequency

The sub-sections below outline the sample frequency and procedures utilized when collecting data or monitoring conditions at the Celatom Mining Complex. As the size of the mine changes, and various theories are proven or disproved, the frequency and methodology used in sampling will also change. When changes are made to the sampling process, the BLM and DOGAMI will be notified of the modification.

9.2.1 Weather Monitoring Frequency

Weather conditions are monitored constantly by the weather station located in Section 36. Currently data recorded includes the 24-hour maximum and minimum for temperature, wind speed, and humidity. All weather data is recorded daily during the mining season; however, during winter months when mining is not taking place, the weather data is not recorded. The weather data is kept on file at EP Minerals office at the processing plant near Vale Oregon. At this time, the data collected from the portable weather station has not been recorded. This weather station has been used solely for determining the best location for diatomite ore stockpiles to facilitate natural ore drying.

9.2.2 Ground Water Monitoring Parameters and Frequency

The groundwater conditions are monitored using the groundwater monitoring wells. Groundwater samples are collected from each water-producing well once per year. These samples are collected using a low-flow sampling technique. As stated in the 2010 Baseline Characterization Report by SRK, the water sampling is described as follows: "Groundwater samples were (and will continue to be) collected using low-flow sampling techniques as described by Puls and Barcelona in USEPA's Ground Water Issue Paper Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures (April 1996). This method minimizes the impact that purging can have on groundwater chemistry during sample collection (such as sediment leaching, oxidation and element desorption) and ensures that the samples collected are representation of the groundwater conditions."[39]

It is important to mention that although this particular low-flow sampling is currently used, in the event a more applicable sampling procedure is discovered, it will be adopted.

9.2.3 Ground Condition Monitoring Procedures

Ground conditions are monitored by all personnel at the Celatom Mining Complex. Specifically, the crew chiefs complete pre-shift inspections for areas where work will

[39] Appendix article 63, Celatom Surface Water – Groundwater Sampling Plan

occur that day. The mine manager, or someone delegated by the mine manager, will complete the survey of monitoring stations and highwall prisms as needed. Throughout the day all mine employees are instructed and trained to watch for changing ground conditions, especially when working on or at the toe of sloped areas.

9.2.4 Surface water Monitoring Procedure and Frequency

All storm-water runoff, and any water pumped from the mining pits, will continue to be collected in one of the many sediment basins located throughout the mining complex. The water in these sediment basins from the pits that contain unoxidized ore would be monitored for pH to ensure that values are between pH 5 and 7.5. If the pH is below a standard unit of 5 then a sample of the water would be collected for full chemical analysis, and corrective action would be taken in order to prevent potential contaminant release to groundwater. Corrective action could include, but would not be limited to, water treatment with agricultural lime, dilution with well water, or treatment with soda ash. No water would be discharged into Mill Gulch.

9.3 Analytical Methods

The data collected from monitoring at the Celatom Mine is filed and stored forreference by EP Minerals. Weather data is collected daily during the active mining season and kept on file at EP Minerals office at the processing plant near Vale Oregon. Observations and survey data for ground conditions are also kept on file at EP Minerals office. Surface water will only be tested for pH unless EP Minerals has reason to believe there could be other contaminants. In the event other contaminants are suspected (if the pH is below a standard unit of 5), a sample of the water will be collected in a clean container, sealed, and sent to a qualified water quality laboratory for analysis. Water samples collected from the groundwater monitoring wells are collected in accordance with the low-flow purging and sampling procedures. These procedures are defined in the Appendix - Article 63 Celatom Surface Water-Ground Water Sampling Plan.

9.4 Reporting Procedures

All data collected for weather, ground water, and surface water will be kept on file by EP Minerals for the foreseeable future. Ground condition information will only remain on file as long as is operationally necessary.

9.5 Procedures to Respond to Adverse Monitoring Results

When adverse conditions are observed, EP Minerals will take corrective action to prevent environmental degradation and to ensure the safety of all employees. The

primary weather hazard that occurs at the Celatom Mine would be high winds, heavy rainfall, or lightning. During these events, operations cease and employees take shelter until the adverse conditions cease.

9.5.1 Adverse Ground Water Conditions

Currently no ground water contamination has been detected at the Celatom Mining Complex. In the event adverse ground water conditions are found to exist, and those conditions pose a threat to the local ecology, EP Minerals will work with the BLM, DOGAMI, and any other necessary consulting agency to correct the problem and prevent further contamination.

9.5.2 Adverse Surface Water Conditions

The only potential surface water issues would possibly be turbidity or pH. The water turbidity is controlled by the numerous sediment basins. In the event adverse surface water conditions are found, remediation of the issues and additional corrective action will be taken if possible.

10.0 Interim Management Plan

The Celatom Mine typically operates seasonally during the months of April through November. When weather conditions allow, and market conditions demand, operations may run year-round. During the winter months of November through April, EP Minerals ensures that conditions at the mine site remain stable and environmentally sound. Such items as storm-water runoff, pit water, slope stability, and road conditions are just a few of the many items that are addressed in the interim management section of this report.

10.1 Measures to Stabilize Excavations and Workings

When excavations are made in the working areas of the Celatom Mine complex they are designed and constructed to remain stable. At times, as is the case in the Kelly Field slide areas, unexpected geologic conditions are encountered which result in slope stability issues. Those instances aside, all working benches are left in a condition with substantial berms, relatively minor slopes, and gentle turns. Proper drainage ditches are constructed to divert storm water into sediment basins thereby preventing the lubrication of clay seams or other slickenside type geologic features. Mine haulage ways accessing open pits are bermed to prevent entrance by the public and any necessary traffic control signs are emplaced to provide the public with warnings of the mine area. Monitoring stations are not surveyed during the winter months due to heavy snowfall.

10.2 Measures to Isolate or Control Toxic or Deleterious Material

At the end of the mining season, all fuel, lubrication oil, and waste oil tanks located within the Celatom Mining Complex are emptied. This prevents both the stealing of fuel

and minimizes the potential for a spill in the event a tank is ruptured during the off season. All valves in the fuel and lube island containment structures are left in the closed positions. All cleaning agents, such as WD-40, or Brake Kleen are secured inside the flammable containers cabinet located inside the Mine shop which remains locked during the off season. Grease and other lubricants are either stored inside the locked storage container or the locked shop. Common household cleaners used for sanitation of the mine camp shower-house are stored in the mechanical room of the shower-house. The shower-house remains locked during the off season. No other toxic chemicals or deleterious materials are knowingly kept on site.

10.3 Provisions for the Storage or Removal of Equipment, Supplies and Structures

During the off season some heavy equipment remains at the equipment staging area in Section 36. The keys are removed from this equipment, master switches are turned off, and the cabs are locked to prevent vandalism. The majority of the equipment utilized at the Celatom Mine during the mining season is typically transferred to the processing facility for winter maintenance. Portable toilet-facilities (port-o-potties) are emptied of all contents and stored in a secure area.

10.4 Measures to Maintain the Project Area in a Safe and Clean Condition

EP Minerals intends to operate the Celatom Mining Complex in a safe and efficient manner at all times. Any condition that jeopardizes the safety of an EP Minerals employee, contractor, or the public traveling through the mine area will be corrected immediately. This core value holds true when the mine is not in operation. As soon as EP Minerals detects or is made aware of any issue corrective action will commence as soon as possible. It is important to note that heavy snowfall, rain, and muddy conditions may limit the ability of EP Minerals to correct slope stability issues, drainage issues, or other problems that can develop during the winter months.

10.5 Plans for Monitoring Site Conditions During Periods of Non-Operations

During the winter months an EP Minerals employee, normally the mine manager or an employee delegated by the mine manager, will inspect the site minimum once per month; this inspection includes checking all equipment and buildings for vandalism, insuring the fuel and lube island containment is in tact, draining storm water accumulation from the fuel and lube island containments, checking the condition of roadways and mine workings, and checking surface water conditions if needed. However, the ore-haul contractor whose employees are on site daily during the off season are also instructed to notify EP Minerals of any problems observed. It is important to note that heavy snowfall prevents access to most of the working areas, other than stockpiles, during most of December, January, and February.

10.6 Mining Schedule (including Notification of BLM and Other Agencies in Non-Operation period)

For the foreseeable future, mining operations will occur from April through November. However, if economic conditions warrant, mining may run year-round. Exploratory drilling may occur at any time during the operating season and is possible in November and December. Winter weather normally prevents any drilling or mining activities in December, January, and February.

11.0 Beede Desert Mine Site

11.1 Location and Access

The Beede Desert mine site is located in the eastern half of Section 33 and the western half of Section 34, both in Township 19S Range 36EWM. The mine workings lie on patented mining claims with the exception of one placer claim which is located on federal land. An ore stockpile and sediment basin are located on the placer claim. The working areas lie on the eastern edge of the Otis Valley and have an approximate elevation of 3800 ft. The Altnow Reservoir is approximately one mile due South of the working area. The Beede Desert operation lies two miles directly West of the Section 36 operating area and is accessible by an improved roadway that was constructed by EP Minerals in 1985. This roadway forks Northwest off of County Road 303, and runs approximately 2.7 miles to the Beede Desert mine site. The mine is also accessible from Otis basin via unimproved BLM roadways. Signs warning of mining activity are clearly visible from any roadway that accesses the working areas.[40]

11.2 Geologic Conditions

The geological conditions present at the Beede Desert mine site are characteristic of the area. Basaltic and andesitic base rock is covered with multiple strata of DE. In the lower strata of the deposit, there are limited amounts of un-oxidized ore. Ash seams and decomposed clay seams are present in the un-oxidized strata. The bulk of the Beede Desert ore body is composed of oxidized ore with intermittent clay seams. The thickness of the deposit varies between 5 to 100 feet. It is believed that this deposit is basically an erosional remnant. Multiple species of diatoms have been found in the Beede Desert ore body; moreover, gypsum is occasionally found dispersed throughout the ore body. Faulting occurs along the eastern flank of the ore body running parallel with the ridge line bordering the Eastern edge of the valley. The ore body has a shallow dip angle ranging between 3 and 12 degrees to the West with a strike at approximately 175 degrees. Overburden consists of silty loam topsoil and a well rounded, poorly sorted layer of gravel; the gravel layer contains material ranging in size form silt to 3 inch well rounded stones.

[40] Appendix articles 11 and 19 for an aerial photograph taken in 2007 and a map illustrating the location of the Beede Desert mine site, stockpiles, topsoil piles, and other workings.

11.3 Ore

The DE ore deposit located at the Beede Desert mine has been a very important ore source since the plant was first constructed in 1986. The Beede ore is nearly all oxidized ore, and it possess unique water flow rate characteristics. This ore possesses very low chemical contaminants that neither Section 36 nor Kelly Field can match. Un-oxidized ore is located at the Beede Desert mine, however, the deposits are small in size and possess inferior quality characteristics; and as a result, EP Minerals does not plan on mining any of this material based on current information. Moreover, every ore deposit has some contamination and the Beede ore deposit is no different. The largest source of waste contamination in the Beede ore deposit is clay which also accounts for the majority of the inter-bedded waste that was used to back fill mined-out sections of the pit.

11.4 Pit Dewatering & Storm Water Runoff Control

Located within the Beede Desert operating area are several small sediment basins. These basins collect storm water runoff from meteoric events. A series of surface drainage ditches channel water to each of these sediment basins. Groundwater runoff from all of the working areas of the pits, ore stockpiles, waste stockpile and roadways is channeled into the sediment basins. Due to the shallow depths of the Beede Desert pit, and the practice of backfilling the pit with waste material, pit dewatering has never been required. The sediment basins are cleaned out when needed with the excavated material being used either for reclamation purposes or placed in the waste stockpile.[40]

11.5 Mining Methods

After the exploration and development stages were completed in the mid 1980's, the overburden (which was mostly topsoil) was removed, stockpiled and seeded for later use in reclamation. The mining method used at the Beede Desert mine is an open-pit mining method wherein the mined out portion of the pit is backfilled with a combination of mine waste and mineral process waste when the ore has been exhausted. The small size and the shallow nature of the Beede ore body, lends itself to backfilling with either mine waste generated from the adjoining pit or from mineral process waste. One waste stockpile is centrally located and represents an ongoing backfill effort within a mined out portion of the initial open pit. The excavations at Beede Desert will never reach a depth requiring a pit wall to be left in place.

11.6 Ore Stockpiling

As previously stated, the Celatom Mining Complex typically operates seasonally during the summer months, and as a result, the ore excavated during the mining season is stockpiled to be consumed at a later date.[41] At Beede Desert, the ore stockpiles are

[40] Appendix articles 11 and 19 for an aerial photograph taken in 2007 and a map illustrating the location of the Beede Desert mine site, stockpiles, topsoil piles, and other workings.
[41] Appendix article 62 EPM Rock Characterization Report

located on top of the centralized waste stockpile or slightly East of that location[40]. As these stockpiles are consumed reclamation of the stockpile pads will occur. At that time the pads are covered with topsoil and reseeded.

11.7 Waste Stockpiles

The waste stockpile for the Beede Desert operating area is located in the center of the pit and has backfilled a large portion of the initial open pit.[50] The lack of groundwater, and the limited quantity of storm water runoff, makes Beede Desert an ideal location for depositing mineral process waste. When mining is occurring at the Beede Desert site, the mineral process and mine wastes are mixed as they are placed in the waste stockpile. When mining is not taking place, the mineral process waste is simply deposited in the waste stockpile. EP Minerals plans to reclaim part of the Beede Desert waste stockpile during the 2008 mining season, conditions permitting. [42]

11.8 Reclamation

Reclamation of the Beede Desert mine site began in 2008 and should be completed within five years. A few small stockpiles could remain on site for five to ten years. Reclamation will ensure that all final stockpile slopes meet DOGAMI specifications (slope angles at an average of 3:1 or less); once this is achieved, topsoil will be placed upon the working areas and the mine haulage roads, and then the areas seeded with a BLM approved seed mix. However, any improved roadways will remain; this is important to mention due to the fact that when EP Minerals proceeds into Section 27, the road currently used to access Beede Desert will be extended to allow access into Section 27.[43]

12.0 Hidden Valley

Surface expressions of DE were discovered in the Hidden Valley area in 1995 with subsequent exploration drilling beginning in 1996. Mining has not yet commenced on the Hidden Valley open pit and it will not commence until an Environmental Impact Statement and this Mine Plan of Operations have been approved. The reason the Hidden Valley deposit is being developed is because the Hidden Valley ores are a highly oxidized ore with properties very similar to the ores found within the Beede Desert deposit. These types of ore are commercially attractive. As the ores at the Beede Desert mine are nearly depleted, it will soon enter the reclamation phase of the mine process, at this point; ore contained in the Hidden Valley ore body will be required as a replacement. EP Minerals plans to operate an open pit mine operation within the confines of what we call Hidden Valley as soon as permitting is secured.

12.1 Location and Access

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[42] Appendix article 20 for location of waste piles
[43] Appendix articles 55 through 59 for the 2008 Celatom Reclamation Plans

Hidden Valley is located in the eastern half of Section 34 Township 19S Range 36EWM. The Hidden Valley operational area lays directly East of Beede Desert, and directly West of the Section 36 operating area. The ore deposit, and subsequent pit, is oriented along a North-South axis between two ridgelines. The name Hidden Valley was coined due to the secluded location of the area. The working areas will be accessed via an improved roadway that will fork north off of the current Beede Desert access road, and will follow the ridgeline dropping into the northern saddle of the valley. Access will also be possible off of the Beede Desert road into the southern portions of the valley. An additional unimproved roadway is planned to link the Section 36 mine area to Hidden Valley; this road is necessary in order to prevent the transportation of heavy mine equipment over an existing improved mine access road[44].

12.2 Geologic Conditions

The geologic conditions in Hidden Valley are very similar to those found in Beede Desert; however, there will be fewer alluvial contaminants due to the absence of an active drainage system capable of depositing silt and gravel type materials in the ore. Hidden Valley sits approximately 4000 feet above sea level, and although it is a "valley", it has virtually no surface or ground water in this area[45]. Located at the South end of Hidden valley is a BLM stock water reservoir; this pond is fed from a small stream that flows in response to precipitation. At this time there are no known faults or unconformities within Hidden Valley.

12.3 Ore

The ore body located within Hidden Valley is a long and narrow deposit which runs along a North-South axis. The ore body is approximately 1000 feet wide, and has a 4,500 foot strike length. The ore body is deepest at the Southern end of the valley, and at which point, the pit depth will be approximately 100 feet deep; however, the ore body does thin as it progresses to the North. Drilling indicates that there is an ash parting that will be waste material; moreover, clay seams are also present throughout the ore body. The entire Hidden Valley ore deposit is comprised of highly oxidized diatomite ore, and at this time, there is no known un-oxidized ore within the ore body. Based upon current drilling information, there is believed to be approximately ten to twenty years of reserves located within Hidden Valley[46].

12.4 Pit Dewatering & Storm Water Control

Preventing turbid storm water runoff, or pit water, from exiting the Hidden Valley opertions area will be accomplished by installing drainage and interceptor ditches, and modifying the current BLM stockwater pond into a single sediment basin for the collection of all drainage water. The stock-water pond will be sufficient to contain the

[44] Appendix article 4 for a map illustrating the location of this roadway
[45] Appendix article 60 for the 2010 Findings report completed by SRK Consulting.
[46] Appendix article 42 for a contour map of Hidden Valley.

runoff from a 100-year storm event. Drainage ditches will run along improved and haulage roadways, around all stockpiles, the waste stockpile, and other working areas. The interceptor ditches will form a perimeter around all of working areas in Hidden Valley, and will intercept surface runoff before it can enter the pit. Once mining has been completed in Hidden Valley, the pond will be reconditioned so that it can remain a stock-water pond.

EP Minerals would like to begin the development stages of the mining process as soon as possible[47].

12.5 Mining Methods

Open pit mining methods will be utilized to extract ore from the Hidden Valley deposit. This will involve the following systematic sequence of events: 1) Exploration (this phase is underway), 2) Development (utilizing drilling to further delineate the ore body for mine planning purposes), and 3) Mining (extracting ore from the Hidden Valley ore body). The mining phase will be the longest phase of the process and will last a minimum of ten years at current ore consumption rates. The final stage of the process will be reclamation which will be addressed in a different subsection of this report.[48]

12.5.1 Hidden Valley Mine Development

Before EP Minerals can begin mining the Hidden Valley ore body, it must first complete additional drilling; complete bulk testing of the ore in the plant, the construction of access roads, and the construction of a storm water drainage system. Additional drilling is necessary in order to ensure that mining begins in an area where quality ore can be reached quickly; moreover, this will ensure that unnecessary or undue disturbance is kept to a minimum and that unnecessary volumes of material are not moved. A drilling plan will be submitted to DOGAMI and the BLM for approval outlining the extent of the required drilling. The construction of new access roads will allow easy access to the initial mine area and will facilitate the construction of a storm drainage system to ensure turbid storm water runoff does not leave the operating area.

Continued development of the Hidden Valley mine will require the construction of one new improved roadway. The improved roadway will connect to the road that accesses Beede Desert and is currently in place. This roadway will extend north to the Eagle deposit. This roadway will be used primarily by EP Minerals' sub-contractor who operates over-the-road trucks to haul ore to the plant, and mineral process waste to the mine for backfill. This improved roadway will be closed to public access until all mining operations in Hidden Valley have ceased.

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[47] Appendix articles 41 and 42 for the one-hundred year event calculations, and a contour map showing the proposed Hidden Valley pit as well as the sediment basin. Please note that due to the small size of the drainage and interceptor ditches, they are not clearly visible one the map

[48] Appendix articles 54 through 59 for the 2008 Celatom Reclamation Plans.

12.5.2 Hidden Valley Open Pit Operations

The mine workings located inside Hidden Valley were designed to maximize ore extraction while ensuring safe working conditions. Diatomite mines commonly have very steep pit wall angles, and portions of the open pit designed for Hidden will have pit wall angles of 89 degrees; however, the overall pit wall angels of the Hidden Valley pit will likely range between 35 and 60 degrees. Although the final dimensions of the pit will depend upon economic factors and geologic conditions, the pit is expected to have a width of 900 to 1200 feet, a length of 4500 feet (North to South), and should have an average depth of 100 feet. Mine waste along with plant mineral process waste will be deposited in a single waste stockpile located at the North end of the valley. This waste stockpile will eventually extend into the pit, thereby partially backfilling the Northern extent of the mine workings. The Southern portion of the pit will remain as a final pit wall.

An open pit mine consists of multiple benches that are connected by ramps. Each bench will be referred to by its elevation. For example a working bench that is 3450 feet above sea level will be called the “3450” Bench. The established bench height for the Hidden Valley pit will be approximately 10 feet; however, EP Minerals may change the bench height to match geologic, ore grade, equipment, or other conditions. No notices will be given when bench heights are adjusted as this will not affect the overall extent of the working area.

Numerous haulage ways will exist throughout the Hidden Valley pit. These ramps which will connect the different benches within the pit, and will normally be 25 to 50 feet in width, and will have slopes ranging from ten to fifteen percent. These haulage ways will be off limits to the public as they are part of the mine workings. Mining equipment will be the primary traffic on these roadways. As adverse geologic conditions, economic factors, or equipment changes are encountered, the ramps located within the pit might have to be positioned differently than in the preliminary pit design. No notices will be given as ramp locations and properties are changed as this will not affect the overall extent of the working area.

Storm water that collects in the pit will always be channeled to the lowest working bench level. Sumps will be located in the lowest working bench level from which water will be pumped only if required. EP Minerals will continue the practice of delaying work in the lower levels of the pit in the spring until the water has evaporated. In the event the water will not evaporate in a timely fashion, as previously stated all tested pit water will be pumped into the sediment basin. Please note that the individual bench sumps will not appear on the Hidden Valley open pit DTM (Digital Terrain Model).
No #49 showing

12.6 Ore Stockpiling

The diatomite ore mined from the Hidden Valley deposit will be stockpiled during the mining season; this material will then be hauled by EP Minerals or a sub-contractor to the processing plant near Vale Oregon. The stockpile area will be located adjacent to the improved roadway currently leading to the Beede Desert operating area (this is a new improved roadway that will lead to the northern end of Hidden Valley), and the current unimproved roadway leading into the southern portions of the valley. This stockpile area will encompass approximately 5 to 10 acres.[50]

12.7 Mine and Mineral process waste Stockpile

Both mine and plant mineral process waste will be deposited in the Hidden Valley waste stockpile. The absence of groundwater makes Hidden Valley an ideal location for the deposition of mineral process waste.[51] During the mining season, mine haul trucks will place mine waste both at the top and bottom of the outlined waste depository. When backfilling is complete the southern slope of the waste stockpile will be reduced to an average slope of 3:1 in accordance with DOGAMI reclamation standards. When possible, the mine waste will be deposited along with mineral process waste for dust control. When active mining is not taking place, the mineral process waste will be deposited on the lower portions of the waste stockpile to minimize wind exposure and erosion. Moreover, whenever possible, the waste stockpile will be covered with topsoil and seeded to minimize fugitive dust and reclaim acreage no longer required for the mining process.[52]

12.8 Hidden Valley Mine Reclamation

All areas of the Celatom Mining Complex, with the exception of final pit walls and improved roadways, will be reclaimed when mining activities cease in those working areas. Hidden Valley is no exception. Once the useable ore reserves contained in the Hidden Valley have been depleted, the reclamation process will begin. The two main areas that will require reclamation in Hidden Valley are the ore and waste stockpile areas. As previously stated, the topsoil from both of these areas will be removed at the start of mining activity. When mining has ceased, and EP Minerals is no longer using the Hidden Valley waste stockpile for mineral process waste, both the stockpile site and the waste stockpile areas will be re-graded and reclaimed. If any of the slope angles of the waste stockpile or stockpile ore pad does not meet the DOGAMI reclamation specification of an average slope of 3:1, they will be corrected, with topsoil placed on the surface, and then seeding with a BLM approved seed mix. The sediment basin and drainage system established around the pit will remain in place.[53]

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[50] Appendix article 62 Rock Characterization and Handling Report

[51] For a detailed analysis of the ground water hydrogeology of Hidden Valley, section 6.1.2 and 6.2.2 in the 2010 Finding Report completed by SRK Consulting located in appendix article 60.

[52] Appendix article 54 through 59 for the "2008 Celatom Reclamation Plans" for a detailed review of the reclamation process

[53] Appendix article 62 Rock Characterization and Handling Report that details drainage

13.0 Section 36 Mine Site

The Section 36 working area contains all necessary infrastructures to operate the Celatom Mining Complex. Located within the confines of Section 36 are the mine shop, the mine office, mine camp, a primary water well, fuel and lube islands, equipment staging areas, and two open pit operations. Section 36 belongs to the State of Oregon and is leased under contract by EP Minerals. Mining operations began in the spring of 1985 in this area, and have continued each mining season since inception. The mine area sits approximately 3800 feet above sea level.

It is important to note that in 1985, 30,000 BCY of topsoil was stockpiled west of the mine shop and re-vegetated in accordance with standards established by the BLM, DOGAMI, the Department of Agriculture, and ODFW. After completion, the stockpile area was fenced off to prevent wildlife and livestock from grazing on the vegetation contained therein. The vegetation growing within the confines of the fenced area represents a reclamation test plot that was subsequently evaluated by DOGAMI.[54]

13.1 Location and Access

The Section 36 operational area is located in Section 36 Township 19S Range 36EWM in Harney County Oregon. It is accessed via Harney County road 303 and is approximately 1.8 miles North of the Beulah cutoff, and is just less than eight miles North of U.S. Highway 20. At the Southern line of Section 36, County Road 303 terminates, at which point EP Minerals maintains an improved roadway an additional 2.0 miles north of that location. The improved roadway is used to access both of the section 36 pits, as well as the Kelly Field operational area. In the future, this roadway will also be used to access the North Kelly Field operating area. In the event of a mine emergency, the mine equipment staging area in Section 36 may also be used as a helicopter landing area; moreover, the coordinates, in latitude and longitude are posted inside the mine office for such an emergency. A trauma kit, AED, eye wash station, and satellite phone are also located in the mine office for emergency purposes.[55]

13.2 Geologic Conditions

The geologic conditions present in Section 36 are considerably different than those discussed in either Beede Desert or Hidden Valley. The ore deposit located in Section 36 is substantially deeper, has a higher dip angle, and contains very large volumes of un-oxidized ores. The DE deposit is located above the basaltic and andesitic rock formations that are thought to be the bottom of the deposit. The topography of the lake bed is not fully known, but it is variable due to the depositional environment and erosional activities that occurred before the deposition of the diatomite. Several minor faults were believed to have passed through Section 36 which has been confirmed by

[54] Appendix article 45 for additional information on reclamation test plot

[55] Appendix articles 12 and 21 for a map and aerial photograph showing the location of Section 36 and section of the aerial photograph taken in 2007

mining activity; these faults are visible in the main pit and are located west of Mill Gulch in Section 36.

The predominant topographical feature is Mill Gulch which runs through the center of the section and contains a small creek that runs seasonally. Also present in Section 36 are three thick ash beds situated above the ore body; each ash seam is separated by diatomite material that is unsuitable for mineral processing. The thickness of these ash beds varies, but it is generally between 5 and 25 feet. The largest seam is visible running along the West wall of the West Pit in Section 36. Like the ore upon which they rest, all three ash seams have a dip angle of 12 to 18 degrees and a strike of 175 degrees.[56]

13.3 Ore

Section 36 is situated on the southern end of an ore deposit that runs from the southern area of Section 36 North through Section 25, into Section 30 (Kelly Field Mine), and then continues North and West into Sections 19 and 24. This ore body has a strike of approximately 175 degrees, and a dip angle of 12 to 15 degrees. Topsoil thickness ranges from 0 to 25 feet with overburden ranging between 5 and 45 feet. This ore deposit is very thick, and has a known thickness in excess of one hundred feet on the West side of Mill Gulch in Section 36, and a thickness of between 80 to 100 feet on the East side of Mill Gulch.

The ore deposit's upper strata are comprised of highly oxidized ore with intermittent decomposed clay seams. These clay seams when lubricated with water are highly unstable and prone to wedge failures; as a result, mining activity must be carefully monitored when excavating the upper oxidized ore strata to prevent a bench failure. Due to this geologic hazard, benches are oriented in such a manner as to prevent wedge failures bounded by clay seams from being created. The oxidized ore strata range in thickness between 20 to 40 feet.

Below the oxidized ore strata lies the transitional ore which ranges in thickness from 10 to 20 feet. The transition ore has visible iron staining and contains higher levels of sulfur and iron[57] along with clay seams.

The un-oxidized ore layer in the Section 36 ore body comprises the bulk of the deposit, and has a known thickness varying between 60 and 100 feet. In many places the bottom extent of the ore body is not yet known. Multiple ash seams are also present throughout the un-oxidized ore layer in varying thicknesses from 6 inches to over 14 feet. Located below the un-oxidized ore is a material that resembles lignite; however, when flux calcined in EP Minerals test lab, it produced a quality product. The un-oxidized ore typically has a much higher moisture and sulfur content than the oxidized ores. Additional study of this material will be necessary in order to properly map the ore

[56] Appendix article 60 for the "2010 Findings Report completed by SRK Consulting" for more details on the geology in the Section 36 mine area.
[57] Appendix article 62 for Rock Characterization and Handling

body located within Section 36. At this time, there is believed to be many years of reserves remaining in Section 36.

13.4 Storm Water Control and Pit Dewatering

A network of drainage ditches is in place in Section 36 to capture and channel storm water runoff into eight different sediment basins. These sediment basins capture all storm water runoff from stockpiles, pits, waste stockpiles, or other working areas. One basin captures runoff from the mine camp, another from the mine shop and staging area, and a third captures all runoff from the East Pit mine area. The remainder of the sediment basins captures storm water runoff or water from pit dewatering from the main pit and stockpile areas. All of these sediment basins function as both retention basins and evaporation ponds, and as a result, they do not discharge water into the Mill Gulch drainage ditch. As the sediment basins fill up with sediment, they are cleaned with the excavated material used either for reclamation purposes or it is deposited in a waste stockpile[58].

Pit dewatering occurs in Section 36 after unusually wet winter seasons; in this situation, water is pumped from the main pit (located West of Mill Gulch); and channeled into one or more of the sediment basins located in Section 36 in order to prevent turbid pit water from reaching the Mill Gulch drainage ditch.[59] As the mining operations expand in the eastern portions of Section 36, additional drainage ditches and sediment basins will be installed to prevent turbid storm water or pit water from reaching Mill Gulch. DOGAMI will be informed of the location and size of the sediment basins before they are installed. If dewatering must occur, the pit water will be pumped into sediment basins and the pH of the water will be tested in accordance with methods described in Section 5.2.

13.5 Mining Methods

The mining methods utilized in Section 36 are open pit mining methods. When all of the mines in the Celatom Mining Complex are examined, it is clear that the main pit in Section 36 most closely resembles a typical open pit operation. As with all locations in the Celatom Mining Complex, the topsoil is removed from the working areas prior to mining; the topsoil is then stockpiled for later use during the reclamation process. Mining will continue in the main pit located at Mill Gulch; however, in the next 5 years, the majority of activity will take place West of Mill Gulch in the East Pit area of Section 36.

The East Pit mine will first expand to the North and West before it is deepened. In time, the East Pit mine will grow and encompass more surface area than the main pit; however, the East Pit mine will not reach the depth of the main pit as the reserves do

[58] Appendix articles 12 and 21 for a map and aerial photograph showing the location of Section 36 and illustrating the location of these sediment basins.
[59] Appendix article 62 Rock Characterization and Handling Report

not extend to those depths in that area. Moreover, in order to maintain the integrity of the Mill Gulch channel, a 100 foot set back from the pits will be maintained from Mill Gulch at all times. The only exception will be wherever it is necessary to cross Mill Gulch with haulage equipment. Both the main pit and East Pit areas of Section 36 have waste stockpiles.

13.5.1 Main Pit

In the main pit of Section 36 the pit wall angles will range between 70 and 89 degrees. The west wall currently in place is an excellent example of a final pit wall that will remain once mining activity has been completed. The main pit will have a final width of approximately 1000 feet, a length along a north south axis, of 2600 feet and a potential depth of 150 feet. Ramp widths will average twenty-five feet, and ramp slopes will range between 10 and 15 percent. The pit is currently 90 feet deep and the exact extent of economic ore reserves is not known at this time.

Although the bottom of the pit has not yet reached the bottom of the reserves the final pit bottom will be very near the current elevation of 3800 feet. If the pit extends lower than 3800 feet it will be backfilled with mine waste to well above the water table and then with a mixture of mine waste and mineral process waste to prevent a permanent pit pond from developing. The main pit will continue to expand to the north possibly entering Section 25 at some time in the future.

13.5.2 East Pit

The East Pit in Section 36 is currently very small and is located due east of the main pit on the East side of Mill Gulch. The future East Pit will be approximately 2000 feet wide; 3500 feet long, along a north south axis, and will have an approximate depth of 100 feet. The exact size of the East Pit will be determined by economic and geologic factors. Due to surface topography there will be a very minimal pit wall along the western side of the East Pit. The eastern side of the pit will press into the ridgeline that runs along a north south axis on the eastern side of Section 36. The final pit wall in this area will range between 30 and 70 degrees. EP Minerals is currently planning on having working bench heights of ten feet in the East Pit workings. Mine haulage ways in East Pit will average 20 feet in width with slopes between 10 and 15 degrees.

13.5.3 Mine Haulage Ways

The mine haulage ways currently in place in both pits average 20 feet in width with slopes between 10 and 20 percent. Future ramps constructed will have travel widths varying between a minimum of 25 road travel widths varying between a minimum of 25 feet and a maximum of 100 feet with slopes no greater than 15 percent. Mine haulage ways are unimproved roadways that are only maintained during periods of active mining and are not intended for public use. The exact height of the benches, and the ramp locations and properties may be changed due to economic, geologic, safety, or equipment variations. Also the exact depth and extent of the pits will vary according to

economic and geologic factors. Since changes to the bench height and ramp properties will not affect the overall extent of the pit, EP Minerals will not issue any formal notices whenever bench heights or ramps are modified.[60]

13.6 Ore Stockpiling

The DE ore excavated from Section 36 will be stockpiled during the mining season in the Section 36 area; however, EP Minerals or a sub-contractor will haul the stockpiled ore to the processing facility throughout the year. There are currently two main stockpile areas located in section 36 that currently contain a total of six stockpiles. The number, size, and location of stockpiles will vary with the demand for ores from Section 36. All of the current stockpile pads have drainage ditches in place to prevent turbid storm water runoff from reaching the Mill Gulch drainage system.[61] In the event additional stockpile areas are required, a network of drainage ditches will be installed to channel all surface water runoff into an appropriately sized evaporative sediment basin. Due to the high moisture content of the un-oxidized ores, the stockpiles in Section 36 are constructed in such a fashion as to aid evaporation by use of natural air flow and solar heating.[62]

13.7 Mine Waste Stockpiles

There are two waste stockpiles located in Sections 36. The first waste stockpile, and also the largest, is located directly south of the main pit and directly north of one of the stockpile pads. The majority of the waste deposited in this stockpile area was mine waste originating from the main Section 36 pit area; however, some mineral process waste was also deposited in this stockpile years ago.[63] The practice of depositing mineral process waste on this stockpile was halted due to the steep grade and fugitive dust issues. The second waste stockpile is located approximately 1300 feet south of the East Pit. Only mine waste material from the East Pit working area has been deposited in this waste stockpile. Both waste stockpiles have drainage systems in place to prevent turbid storm water runoff from reaching the Mill Gulch drainage ditch. After the stockpile slopes have been reduced, they will be seeded with a BLM approved seed mixture.

13.8 Reclamation

When mining activities have come to an end, and the ore body in Section 36 has been depleted of quality ores, the reclamation process will begin. Due to the nature of the pits in Section 36 several permanent pit walls will remain Pit backfilling will be the

[60] Appendix article 47 contour map illustrating the probably future pit operations in Section 36
[61] Appendix article 62 Rock Characterization and Handling Report
[62] Appendix article 21 for an aerial photograph showing the location of the Section 36 stockpiles and both waste stockpiles.
[63] Appendix article 62 Rock Characterization and Handling Report

preferred reclamation method in Section 36. All other features will be reclaimed in accordance with DOGAMI specifications.[64]

14.0 Kelly Field Mine Site

The Kelly Field mine is located in Malheur County Oregon and is situated approximately 3950 feet above sea level. Initial mining activities began at this location in 1986, and mining has continued in this section every year since inception. The Kelly Field mine is the most northern active mine area in the Celatom Mining Complex; it is situated on both public lands (managed by the BLM), and on private land owned by EP Minerals.[65] The Kelly Field mine currently supplies the majority of diatomite ore used by the plant, and therefore, it sees substantial mining activity every season. The size and depth of the reserves located within the Kelly Field operating area will foster mining activities for years to come. All ore types are found and have been mined from the Kelly Field workings including oxidized, transitional, and un-oxidized ores. In order to support ongoing mining efforts, there may be need to install a truck scale that will be used for weighing the mine haul trucks on a occasional basis; moreover, there will also be a need for an additional water well to supply water for dust suppression activities. These improvements, should they occur, would be located on private property owned by EP Minerals.

At times there are unforeseen events that occur that can change how mining occurs; this recently happened in the Kelly Field mine when a slope failure occurred along the eastern pit limit at the toe of Agency Mountain. As a result of this failure, additional topsoil and waste materials had to be removed and stockpiled to help secure the slope area (*see section 8.4 for additional information).*

14.1 Location and Access

The Kelly Field open pit is located in Section 30 Township 19S Range 37EWM in Malheur County Oregon. It is one mile northeast of the Section 36 operating area. The primary access to the mine area is an improved roadway that is an extension of Harney County Road 303. This improved roadway is maintained by EP Minerals or a sub-contractor and is paved right up to the mine maintenance shop. This improved roadway continues as a gravel roadway through the center of the section and is a public access roadway. A detour is in place to keep the public out of the active pit areas of the Kelly Field mine; this detour will remain in place for the foreseeable future[66]. This road is used by local ranchers and hunters during the hunting season.

[64] Please note Section 10 of this report for additional details of the reclamation process. Also, appendix article 56 for reclamation calculations and maps for Section 36.
[65] Appendix article 6 for a property map of the Kelly Field mine area.
[66] Appendix articles 13 and 12 for a map illustrating the current Kelly Field public road detour.

14.2 Geologic Conditions

The geology in Kelly Field is somewhat different from that found in Section 36, although the ore deposit is the same in both locations. The ore deposit sits in the valley which is flanked by ridgelines on either side. The southern portion of the valley widens between the ridgelines before narrowing as it follows Mill Gulch into Section 36. The ridgelines on all sides of the ore deposit are composed of basaltic rocks with some tuffs, andesite, and other weathered volcanic materials. At least one fault zone is present along the eastern edge of the deposit, and it is possible that the entire valley is a grobbin with faulting occurring down each side. The Mill Gulch drainage ditch meanders through the center of the section and runs seasonally in response to precipitation.[67]

14.3 Ore

The ore body located in Kelly Field is a continuation of the same ore body that is found in the Section 36 working area. It also continues north in Sections 19 and 24. It is characterized by the presence of highly oxidized ores in the upper strata, transition ores directly below the oxidized ore, and a thick band of un-oxidized ore comprising the lower portions of the deposit. Currently the deposit is thought to be approximately 2500 feet wide, 4500 feet long (north to south) and has a confirmed thickness of 270 feet. Limited deep drilling has found lignite-like material capable of producing quality diatomite products, as well as organic material under the un-oxidized ores. Additional drilling will be required to properly develop the lower portions of the ore deposit, as well as to determine the lower extent of the pit and the deposit. As in section 36, the oxidized ore strata varies in thickness from 10 to 40 feet. Clay seams are commonly found in the oxidized ore as well as some gypsum. The transitional ore strata is similar to Section 36 in that it contains visible iron staining and along with higher levels of sulfur and iron.[68] Moreover, clay seams are also found throughout the transitional ore but are normally less than six inches in thickness. Un-oxidized ore comprises the bulk of the Kelly Field ore deposit. The un-oxidized ore has much higher sulfur and moisture content. Ash seams are also abundant within the un-oxidized ore. The deposit has a strike of 170 degrees with a dip angle of 12 to 18 degrees.

14.4 Slope Stability

In 2003, and again in 2008, a slope failure occurred at the intersection of the eastern edge of the Kelly Field open pit mine and the toe of Agency Mountain. This failure primarily occurred due to high precipitation that weighted the DE with moisture and caused a rotational failure. Although the failures did not cause severe disruption to the mining operations, the 2003 slide did render a BLM roadway impassable. Furthermore it facilitated the need to move the operating permit boundary to allow the failures to be stabilized and the BLM roadway reestablished.

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[67] Appendix article 60 for the "2010 Findings Report completed by SRK Consulting."
[68] Appendix article 62 Rock Characterization and Handling Report

Field geological analysis indicates that the back wall of this failure is the boundary between the diatomaceous ore body and the basaltic rock of Agency Mountain. The basaltic rock high-wall has a strike parallel to Agency Mountain (approximately 165 degrees) and a steep dip angle of approximately 70 to 85 degrees. Although this wall is relatively stable, the boundary between the two materials is very unstable. This boundary zone also contains highly weathered basalt, weak clays, tuff, and volcanic conglomerates possibly created by pyroclastic flows.

There are several facts that must be considered when creating a solution to slope stability issues. The first consideration is that safety catch benches will need to be constructed in the basalt backwall area to ensure the safety of mine operations as they progress deeper (the benches will also create the final pit wall); moreover, the benches will function as catch benches long after mining has been completed. Over time, natural freeze-thaw cycles will the benches into a talus slope.

In order for the slope failure remediation to occur additional drilling and exploratory dozer cuts will be made at or very near the contact zone between the diatomite ore body and the basalt backwall. Once completed excavation of the backwall can begin and the ore in this area can be accessed. Once mining has been completed the BLM roadway will be reestablished.

The Kelly Field highwall remediation project will take a minimum of 5 years to fully complete, and will involve three phases of excavation plus additional monitoring requirements. The first step which is to survey the area and establish ground movement monitoring stations has been completed. These stations were installed in the spring of 2006 and remain in place today. When work is being completed on the slide area, they are monitored on a regular basis to detect any ground movement above the working area. Additionally as the highwall has increased in height monitoring prisms have been installed and are “shot” at regular intervals when work in in progress.

The second step was to determine the exact location of the boundary between the basaltic rock and the diatomite ore contact. The contact area has now been identified along Agency Mountain. Now that the exact location of the contact zone has been determined, a three phase plan has been initiated to install benches into the basalt rock high-wall. This basalt highwall will remain as a permanent pit wall.

The final phase is in itself a three phase excavation plan to install safety catch benches downward to create the final pit wall. The exact location and dimensions of these benches is not yet known; however, the bench height and width will be approximately 20 to 25 feet forming an overall pit wall angle of approximately 45-degrees. In places, the pit wall will be steeper as more competent basaltic rock can safely withstand steeper slope angles, and in other places it may be shallower if tuffs or volcanic conglomerates

are present. The final pit wall angle will be dependant upon the structural geology encountered.[69]

14.5 Storm Water and Pit Dewatering

Currently a series of drainage ditches and sediment basins are in place within the Kelly Field operating area; these are necessary to prevent turbid storm water runoff or pit water from reaching the Mill Gulch drainage system. There are a total of four sediment basins located throughout the Kelly Field mine workings. One basin is located west of Mill Gulch and captures the runoff from a stockpile pad located near the basin. All other sediment basins are east of Mill Gulch, and capture the runoff from the pit, waste stockpiles, or stockpile pads. These basins are cleaned out as necessary with any excavated material used for reclamation or placed in a waste stockpile. Pit dewatering activities have been rare at the Kelly Field mine; however, as the pit continues to expand, and reaches greater depths, pit dewatering is possible.[70] The BLM and DOGAMI will be notified before additional basins are installed. [71]

14.6 Mining Methods

Open pit mining methods are utilized at the Kelly Field mine site. Although the bottom extent of the deposit has not yet been determined, the pit is expected to expand downward a minimum of 40 more feet with the lowest bench having an elevation of 3940 feet above sea level. This elevation could reach further downward if additional developmental drilling locates the lower portions of the ore body. The proposed pit for Kelly field mine encompasses all of the area now occupied by the current pit operations, as well as additional acreage to the south. The extent of the Kelly Field pit will vary due to geologic and economic factors. The proposed pit will be approximately 1600 feet wide, 3350 feet long (north to south), and will have a probable depth of 100 or more feet. The final pit wall along Agency Mountain will be approximately 200 feet high. The center portion of the pit that has been backfilled with mine and mineral process waste will remain unchanged. It will not be reclaimed in the foreseeable future but instead will be used as a central ore stockpile location for the Kelly Field ores.

14.6.1 Mine Haulage Ways

The preliminary pit design for Kelly Field will utilize ramps and mine haulage ways that have an average travel width varying between a minimum of 25 feet and a maximum of 100 feet with slopes between ten and fifteen degrees. The exact height of the benches, and the ramp locations and properties may be changed due to economic, geologic, safety, or equipment considerations. Also the exact depth and extent of the pits will vary according to economic and geologic factors. Since changes to the bench height

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[69] Please see appendix articles 48, 49, and 50 for photographs of the Kelly Field slide and a contour map outlining the proposed pit wall.
[70] Appendix article 62, Rock Characterization and Handling Report
[71] Appendix article 22 for the aerial photograph showing the location of the sediment basins currently located in Kelly Field.

and ramp properties will not affect the overall extent of the pit, EP Minerals will not issue any formal notices whenever bench heights or ramps are modified. Mine haulage ways are only maintained when mining is occurring in that area and are not intended for public travel. Mine haulage ways will continue to be off limits to the public.

14.6.2 Final Pit Walls

Final pit wall angles in the Kelly Field pit will vary depending upon location. Along the western edge of the pit, the final wall angles will range between 70 and 85 degrees; whereas, along the eastern side of the pit, the wall slope angle will be closer to 45 to 60 degrees. EP Minerals will work with DOGAMI to establish a stable final pit wall. The current pit will expand to the south and will increase in depth. As mining progresses over time, it is probable that the Kelly Field pit will also expand north into Section 19. All topsoil removed from the mining areas has been stockpiled and will be used during the reclamation process. All waste stockpiles, stockpile pads, and main haulage ways will be reclaimed when mining operations have ceased.[72]

14.6.3 Mining West of Mill Gulch

EP Minerals has no immediate plans to expand the Kelly Field pit into the area west of Mill Gulch in Section 30 (formerly referred to as North Kelly Field); however, there is a sizeable quantity of ore located in that area that could be mined in the future. When the decision is made to expand operations into the area west of Mill Gulch in Section 30, EP Minerals will have to complete several actions. The first task will be to complete a preliminary pit design to define the scope of the expansion. The second task will be to plan a timber sale to adhere to the, "1984 Decision Record/Rationale EA-OR-020-5-2"; another stipulation states that, "*To minimize impacts of wildlife, removal of ponderosa pine and western juniper along the western side on North Mill Gulch mine site shall be delayed as long as this can be feasibly be accomplished without interfering with the mining operations*"[73]. EP Minerals shall notify the BLM at least two full years in advance of the date when the timber sale will be planned to allow the BLM adequate time to determine the most suitable method of disposal of the timber (e.g., commercial timber sale vs. ground clearing by EP Minerals, etc.) and to make all necessary arrangements."

14.7 Ore Stockpiling

The diatomite ore excavated from the Kelly Field open pit mine is stockpiled during the mining season and later hauled by EP Minerals or sub-contractor to the processing facility throughout the year. Currently there are a number of stockpiles located throughout the Kelly Field operational area including two west of Mill Gulch.[74] This will allow EP Minerals to eliminate the unimproved roadway detour for public vehicles

[72] Appendix article 22 for an aerial photograph showing the current Kelly Field workings and article 50 for a contour map outlining the proposed pit
[73] Appendix article 53 copy of the timber inventory report
[74] Appendix article 62, Rock Characterization and Handling Report

currently in place, and to reroute the detour across the area that is currently known as KF stockpile 1. Stockpile 1 will be reconstructed in the central stockpiling area on top of the pit waste stockpile in the center of the current Kelly Field mine operation.

As operations expand in Kelly Field, additional stockpile pads will be required. Also, the exact size and number of ore stockpiles will vary from year to year; this is because the size and number of stockpiles is dependant upon the amount of Kelly Field ore required during a particular mining season. Before a new stockpile area is constructed, all topsoil will be removed and stockpiled for future reclamation purposes. EP Minerals will continue the practice of placing additional stockpile pads in areas already disturbed by mining, such as in mined out or backfilled areas, to minimize the total acreage disturbed by mining. Due to the high moisture content of the un-oxidized ores, the stockpiles in Kelly Field are constructed in such a fashion as to aid evaporation by use of natural air flow and solar heating.[75]

14.8 Mine and Mineral process waste Stockpile

Currently three different waste stockpiles have been constructed at the Kelly Field mine. The most visible of these is located southeast of the pit adjacent to Agency Mountain; this pile is built off of a topographical toe, and resembles a Butte. The second waste stockpile is located in the center portion of the Kelly Field mine; this stockpile was constructed by backfilling an excavated open pit and was completed in 2007. Both mine and mineral process waste were deposited in this central waste stockpile. In order to accommodate the generation of mine waste from the 2008 mining season a third waste rock stockpile was constructed in 2008. This stockpile is located in the SW ¼ of S30 on EP owned property. This was a short-term waste rock stockpile and will be reclaimed by 2012. Should EP Minerals reach an agreement with a third party private landowner who owns land in the SE ¼ of Section 30 EP Minerals would consider stockpiling mine waste material on that property. DOGAMI would be notified and consulted should this occur.
Should the Kelly Field pit advance below the water table EP Minerals will backfill with mine waste only.

14.9 Reclamation

During the 2007 mining season a small stockpile area (approximately 1.2 acres in size) was reclaimed. As operations continue areas no longer needed will be reclaimed in a timely fashion. As with all reclamation , reclaimed areas will be shown to the DOGAMI and BLM inspectors when they conduct their annual inspections.

[75] Appendix article 22 for an aerial photograph showing the location of the stockpiles and current working area currently located at Kelly Field. Also, article 50 for a contour map outlining the proposed pit. In article 22, there is a map that contains an outline of the area reclaimed in 2007 and show the area reclaimed in 2008.

15.0 North Kelly Field (Section 19 & 25)

15.1 Location and Access

The Mining claims that comprise the North Kelly Field mine are located in Section 19 Township 19S Range 37EWM (Malheur Co.) and in Section 24 Township 19S Range 36EWM (Harney Co.). Section 19 lies directly north of the current Kelly Field working area. This mine will be accessed via the BLM roadway which runs through Section 36 and Kelly field mines. As the North Kelly Field mine is developed this roadway will be improved to facilitate access into North Kelly Field.[76]

15.2 Geology Geologic Conditions

The geology of North Kelly Field is very similar to that found in Kelly Field with a few modifications. The ore deposit sits in the valley which is flanked by ridgelines on either side. The southern portion of the valley narrows between Agency Mountain on the east and a steep knob type feature on the west. Mill Gulch originates in the northern portions of Section 19 and flows south through the valley into the Kelly Field mining area before continuing on through Section 36. The ridgelines on all sides of the ore deposit are composed of basaltic rocks with some tuffs, andesite, and other weathered volcanic materials. At least one fault zone is present along the eastern edge of the deposit, and it is possible that the entire valley is a grobbin with faulting occurring down each side. The Mill Gulch drainage ditch meanders through the center of the section and runs seasonally in response to precipitation.[77]

Due to the slope stability issues which occurred along Agency Mountain in the Kelly Field mine there is a very high likelihood that EP Minerals will need to continue the final pit walls established in Section 30 north along Agency Mountain into the North Kelly Field area. This will prevent unplanned slope failures from presenting future hazards to mine employees and the public. The benches, like the ones at Kelly Field, will be established in the competent basaltic rock of Agency Mountain and will remain as final pit walls. Additional final pit walls in basalt or other competent rock are likely in North Kelly Field due to the terrain and geologic conditions.

15.3 Ore

The ore deposit located within the North Kelly Mine is very similar to the deposit as it exists in the Kelly Field mine. The ore body located in North Kelly Field is a continuation of the same ore body that is found in the Section 36 and Kelly Field working areas. It is characterized by the presence of highly oxidized ores in the upper strata, transition ores directly below the oxidized ore, and a thick band of un-oxidized ore comprising the lower portions of the deposit. Currently the deposit is thought to be approximately 2500 feet wide, 5000 feet long (north to south) and has a confirmed

[76] Appendix article 16 for location of roads.
[77] Appendix article 7 for geologic map of area. Appendix article 60 for the "2010 Findings Report completed by SRK Consulting"

thickness of 225 feet. Additional drilling will be required to properly develop the lower portions of the ore deposit, as well as to determine the lower extent of the pit and the deposit.

As in section 36 and Kelly Field, the oxidized ore strata vary in thickness from ten to forty feet. Clay seams are commonly found in the oxidized ore as well as some gypsum. The transitional ore strata is similar to Section 36 and Kelly Field in that it contains iron staining and slightly higher levels of sulfur and iron. Moreover, clay seams are also found throughout the transitional ore but are normally less than six inches in thickness. Un-oxidized ore comprises the bulk of the North Kelly Field ore deposit. The un-oxidized ore has much higher sulfur and moisture content. Ash seams are also abundant within the un-oxidized ore. The deposit has a strike of 170 degrees with a dip angle of 12 to 18 degrees.

15.4 Storm water control and Pit Dewatering

Currently no mining activity has taken place in the North Kelly Field area.[78] The BLM and DOGAMI will be notified when additional basins are installed.[79] As in Hidden Valley before mining is initiated interceptor ditches, drainage ditches, and sediment basins will be installed. During the operating season water will be allowed to evaporate. If dewatering must occur the pit water will be pumped into sediment basins and the pH of the water in the sediment basin will be monitored for the duration of dewatering to ensure that the pH is between 5 and 7.5. Corrective action will be initiated if unsuitable pH is indicated as described in Section 5.2.

15.5 Mining Methods

Open pit mining methods will be utilized at the North Kelly Field mine site. Although the bottom extent of the deposit has not yet been determined, the pits are expected to extend downward to a bottom elevation of approximately 3940 feet above sea level. It is possible that this elevation will reach further downward when additional developmental drilling locates the lower portions of the ore body.

The proposed pits for the North Kelly field mine encompass two areas. The development of the North Kelly field mine will follow the following sequence: 1) Exploration, 2) Development (utilizing drilling to further delineate the ore body for mine planning purposes, this phase is 60% complete), 3) Mining (extracting ore from the North Kelly Field ore body). The mining phase will be the longest of these phases and is expected to take twenty years depending on demand. The mining phase will in itself be three different phases. The final stage of the process will be reclamation which will be addressed in a different subsection of this report.

The mining process in North Kelly Field will occur in three stages. Stage one will involve the development of the open pit east of Mill Gulch. The mine waste from this pit

[78] Appendix article 60, Rock Characterization and Handling Report
[79] Appendix article 16 for location of roads and basins.

will be used to backfill the current Kelly Field pit. Once the East Pit of Kelly Field North has been completed the West Pit will begin. The West Pit will be located west of Mill Gulch and will be very similar in size to the East Pit. The mine waste material from the West Pit will be used to backfill the East Pit. Consequently the East pit will not extend below the water table. The third stage will involve re-channeling Mill Gulch through the backfilled East Pit. This channel will be lined with either well packed diatomite and rip rap or well pack clay and gravel. It will re-direct Mill Gulch through the former East Pit reconnecting it with the flow line of Mill Gulch at the Section 19, Section 30 boundary. The exact extent of each pit will vary due to economic and geologic conditions but each pit should be approximately 1500 feet wide, 3500 feet long (north to south) and will have a probably depth of 100 feet or more. Final pit walls will remain along the eastern edge of the East Pit and the western edge of the West Pit.

15.5.1 Mine Haulage Ways

The proposed pits for North Kelly Field will utilize ramps and mine haulage ways that have an average travel width varying between a minimum of 25 feet and a maximum of 100 feet with slopes between ten and fifteen degrees. The exact height of the benches, and the ramp locations and properties may be changed due to economic, geologic, safety, or equipment considerations. Also the exact depth and extent of the pits will vary according to economic and geologic factors. Since changes to the bench height and ramp properties will not affect the overall extent of the pit, EP Minerals will not issue any formal notices whenever bench heights or ramps are modified. Mine haulage ways are only maintained when mining is occurring in that area and are not intended for public travel. Mine haulage ways will continue to be off limits to the public.

15.5.2 Final Pit Walls

Final pit wall angles in the North Kelly Field pits will vary depending upon location. Along the western edge of the East Pit, the final wall angles will range between 70 and 85 degrees; whereas, along the eastern side of the East Pit, the wall slope angle will be closer to 45 to degrees. In the West Pit, final pit wall angles in the eastern side will be approximately 45 degrees with final pit wall angles ranging between 70 and 85 degrees on the west side. EP Minerals will work with DOGAMI to establish stable final pit walls in both pits. It is important to mention that the East Pit in the North Kelly Field mine will connect with the pit currently in operation in Kelly Field creating one large open pit area. As the East Pit of North Kelly Field is developed the current Kelly Field pit will be backfilled with mine waste. All topsoil removed from the mining areas has been stockpiled and will be used during the reclamation process. All waste stockpiles, stockpile pads, and main haulage ways will be reclaimed when mining operations have ceased.[80]

[80] Appendix article 22 for an aerial photograph showing the current Kelly Field workings and article 50 for a contour map outlining the proposed pit.

5.5.3 North Kelly Field West Pit.

Before the West Pit is developed, EP Minerals will work with the BLM to have a timber sale for the Ponderosa located in that area. Before operations expand into the area west of Mill Gulch in Section 19, EP Minerals will have to complete several actions. The first action will be to complete a preliminary pit design to define the scope of the expansion. The second action will be to plan a timber sale to adhere to the, "1984 Decision Record/Rationale EA-OR-020-5-2"; another stipulation states that, "*To minimize impacts of wildlife, removal of ponderosa pine and western juniper along the western side on North Mill Gulch mine site shall be delayed as long as this can be feasibly accomplished without interfering with the mining operations*".[81] EP Minerals shall notify the BLM at least two full years in advance of the date when the timber sale will be planned to allow the BLM adequate time to determine the most suitable method of disposal of the timber (e.g., commercial timber sale vs. ground clearing by EP Minerals, etc.) and to make all necessary arrangements."

15.6 Ore Stockpiling

The diatomite ore excavated from the North Kelly Field open pit mine will be stockpiled during the mining season and later hauled by EP Minerals or sub-contractor to the processing facility throughout the year. There will be a number of stockpiles located throughout the North Kelly Field operational area. The ore will be stockpiled based upon grade and ore quality. Stockpiles will be located east and west of Mill Gulch depending upon which pit is in operation. Also, the exact size and number of ore stockpiles will vary from year to year; this is because the size and number of stockpiles will be dependant upon the amount of North Kelly Field ore required during a particular mining season. Due to the high moisture content of the un-oxidized ores, the stockpiles in North Kelly Field will be constructed in such a fashion as to aid evaporation by use of natural air flow and solar heating.

15.7 Mine and Mineral process waste Stockpiles

During the first phase of mining at North Kelly Field, all mine waste will be deposited in the current Kelly Field pit. Mineral process waste will be deposited at the Hidden Valley operation and therefore should will not be a factor when backfilling in North Kelly Field. The Kelly Field pit will provide ample capacity for all mine waste generated from the East Pit in North Kelly Field. When mining progresses in phase two the mine waste from the West Pit will be used to backfill the East Pit. This will required that the East pit not progress below the water table to allow a full backfill. This will result in the East Pit being backfilled, the Kelly Field pit being backfilled, and a final open pit in the western area of North Kelly Field. The west pit will have a partial engineered backfill that will allow the west pit to act as an evaporative sump thereby preventing the formation of a pit pond. This will prevent the migration of any sulfide oxidation products into the groundwater and will ensure that infows of groundwater to the pit will be less than net

[81] Appendix article 53 copy of the timber inventory report

yearly evaporation; thus, the open pit will act as a perpetual groundwater sink drawing groundwater toward the pit from all directions and no pit lake will form.

15.8 Reclamation

Reclamation of the North Kelly Field area will follow the same guidelines as in all other working areas of the Celatom Mining Complex. Topsoil piles will be seeded to limit erosion. As the Kelly Field pit is backfilled, topsoil will be put into place and seeded. When the East Pit is backfilled it too will have topsoil emplaced and seeded. Flat benches and all other areas aside from final pit walls disturbed by mining will be covered with top-soil and seeded. The original flow line of Mill Gulch will not be restored. The re-channeled flow line will remain once all mining activities have been completed.

16.0 The Eagle Pit (Section 27)

The Eagle Mine is a deposit of DE located north of the current Beede Desert mine site. It is named after the company and will be referred to as the Eagle Mine. This area will be the site of open pit mine operations which will extract diatomite ore for use in the global minerals marketplace. It is noteworthy to mention that the claims in this area are also titled “Eagle.” The diatomite ore extracted from the Eagle Mine will be used to produce a variety of diatomite products.

16.1 Location and Access

The Eagle Mine is located in Section 27, Township 19S Range 36EWM. This mine will be located directly north of the current Beede Desert operating area and north-north-west of the Hidden Valley mine. It will be accessed via the improved roadway currently used to reach Beede Desert. This roadway will be extended to the north to access the Eagle Mine. It is also probably that the improved roadway constructed for the Hidden Valley mine will also be extended north and west to reach the Eagle Mine waste stockpile. Both of these roadways would be improved roadways accessible by over the road trucks.[82]

16.2 Geologic Conditions

The geology found in the Eagle Mine is similar in nature to that found in Beede Desert and is characteristic of the area. Basaltic and andesitic base rock is covered with multiple strata of DE. The ore body is comprised of multiple strata of all types of ore, as well as clay, decomposed ash, and ash seams. The deposit is approximately fifty percent oxidized and fifty percent un-oxidized. Above the un-oxidized ore strata lies the transition and oxidized ores. Clay seams are present in the oxidized ore strata. The thickness of the deposit varies between 25 and 125 feet in thickness. The ore body has a shallow dip angle ranging between 3 and 15 degrees with a strike at approximately 180 degrees. Overburden consists of silty loam topsoil and well rounded, poorly sorted

[82] Appendix article 17 of the Eagle Mine Operation area

gravel. There is also a layer of basalt boulders present across the surface. These boulders will be piled separately from the topsoil. The gravel contains material ranging in size from silt to 3 foot diameter basaltic rocks.[83]

16.3 Ore

The DE ore deposit located within the Eagle Mine area will serve as a supplemental ore body for both Hidden Valley and North Kelly Field. Market conditions will determine the quantity of material required from the Eagle Mine annually. The high quality oxidized ores as well as the un-oxidized ores found in the Eagle Mine will all be excavated for use at the plant. As is found in the Section 36 and Kelly Field ore deposits, the upper strata consists of oxidized ores with clay and decomposed ash seams. The oxidized ore varies in thickness from 10 to 40 feet. The transition ore is found directly below the oxidized ore and varies in ranges between 20 and 40 feet thick. Below the transition ore lies the un-oxidized ore. The un-oxidized ore stratum contains ash seams and ranges from 35 to 50 feet in thickness. The most common source of contamination will be clay in the oxidized ore strata and ash in the un-oxidized ore strata. All of these materials as well as DE that is of poor quality will be deposited in the mine waste stockpile for the Eagle Mine.

16.4 Storm Water Control and Pit Dewatering

Before mining activities occur at the Eagle Mine drainage ditches and sediment basins of a size large enough to handle a 100 year event will be constructed. Although this area is especially dry EP Minerals will still take all necessary precautions to prevent turbid storm water from discharging from the Eagle Mine area. If pit ponds develop, the practice of allowing the water to evaporate will be used. Pit pumping will occur only when required. All water pumped from the pit will be placed into one of the evaporative sediment basins. The pit water will be monitored for pH to ensure values between 5 and 7.5; corrective action will be taken if required as described in Section 5.2.

16.5 Mining Methods

Open pit mining methods will be utilized at the Eagle Mine Site. This will involve the following systematic sequence of events: 1) Exploration (this phase has been completed), 2) Development (utilizing drilling to further delineate the ore body for mine planning purposes), and 3) Mining (extracting ore from the Eagle Mine ore body). The mining phase will be the longest phase of the process and is expected to last twenty to thirty years. Although the bottom extent of the deposit has not yet been determined, the pit is expected to expand downward a minimum of 60 to 100 feet from the current surface topography. Preliminary pit designs indicate the Eagle Mine pit will be approximately 900-1200 feet wide, 3500 feet long (north to south) and 100 to 120 feet deep (from current surface topography). The exact extent and depth of the pit will be dependent upon the geologic conditions encountered once mining commences. Mine

[83] Appendix article 7 of geologic map of area

waste and mineral process waste will likely be deposited in one centralized waste stockpile which will be sloped according to DOGAMI specifications as it is constructed.

16.5.1 Eagle Mine Development

Before EP Minerals commences mining activities in the Eagle Mine ore body, additional developmental drilling and bulk sampling will be required. The necessary access roads and storm water drainage system will also be constructed. All topsoil removed will be stockpiled for use later during the reclamation process. Before development drilling is initiated the BLM and DOGAMI will be notified and the drilling plan will be submitted to both agencies for their review. The construction of new access roads will allow easy access to the initial mine area and will facilitate the construction of a storm drainage system to ensure turbid storm water runoff does not reach the nearby drainage systems. The improved roadway currently used to access the Beede Desert mine site will be lengthened into Section 27 to access the Eagle Mine.

The proposed pit for the Eagle Mine will utilize ramps and mine haulage ways that have an average travel width varying between a minimum of 25 feet and a maximum of 100 feet with slopes between 10 and 15 degrees. The exact height of the benches, and the ramp locations and properties may be changed due to economic, geologic, safety, or equipment considerations. Also the exact depth and extent of the pits will vary according to economic and geologic factors. Since changes to the bench height and ramp properties will not affect the overall extent of the pit, EP Minerals will not issue any formal notices whenever bench heights or ramps are modified. Mine haulage ways are only maintained when mining is occurring in that area and are not intended for public travel. Mine haulage ways will continue to be off limits to the public.

16.5.2 Eagle Mine Open Pit Operations

The mine workings located inside the Eagle Mine will be designed to maximize ore extraction while ensuring safe working conditions. Diatomite mines commonly have very steep pit wall angles, and portions of the open pit designed for the Eagle Mine will have pit wall angles of 89 degrees; however, the overall pit wall angles of the Eagle Mine pit will likely range between 35 and 60 degrees. Although the final dimensions of the pit will depend upon economic factors and geologic conditions, the pit is expected to have a width of 900 to 1200 feet, a length of 3500 feet (North to South), and should have an average depth of 60 to 100 feet. Mine waste along with mineral process waste will be deposited in a single waste stockpile. The exact location of this waste stockpile has not yet been determined. Ideally this waste stockpile will eventually extend into the pit, thereby partially backfilling the mine workings.

An open pit mine consists of multiple benches that are connected by ramps. Each bench will be referred to by its elevation. For example a working bench that is 3450 feet above sea level will be called the “3450” Bench. The established bench height for the Eagle Open Pit Mine will be approximately 10 feet; however, EP Minerals may change the bench height to match geologic, ore grade, equipment, or other conditions. No

notices will be given when bench heights are adjusted as this will not affect the overall extent of the working area.

Numerous haulage ways will exist throughout the Eagle Mine Pit. Ramps will connect the different benches within the pit, and will normally be 25 to 50 feet in width, and will have slopes ranging from ten to fifteen percent. These haulage ways will be off limits to the public as they are part of the mine workings. Mining equipment will be the primary traffic on these roadways. As adverse geologic conditions, economic factors, or equipment changes are encountered, the ramps located within the pit might have to be positioned differently than in the preliminary pit design. No notices will be given as ramp locations and properties are changed as this will not affect the overall extent of the working area.

Storm water that collects in the pit will always be channeled to the lowest working bench level. Sumps will be located in the lowest working bench level from which water will be pumped only if required. EP Minerals will continue the practice of delaying work in the lower levels of the pit in the spring until the water has evaporated. In the event the water will not evaporate in a timely fashion, we will utilize a pump to dewater the pit. As previously stated, all pit water will be pumped into the sediment basin.[84]

16.5.3 Final Pit Walls

Final pit wall angles in the Eagle Mine Pit will vary depending upon location. Along the western edge of the pit, the final wall angles will range between 70 and 85 degrees; whereas, along the eastern side of the pit, the wall slope angle will be closer to 45 to 60 degrees. EP Minerals will work with DOGAMI to establish a stable final pit wall. All topsoil removed from the mining areas has been stockpiled and will be used during the reclamation process. All waste stockpiles, stockpile pads, and main haulage ways will be reclaimed when mining operations have ceased.

16.6 Ore Stockpiling

The diatomite ore excavated from the Eagle Open Pit Mine will be stockpiled during the mining season and later hauled by EP Minerals or sub-contractor to the processing facility throughout the year. Multiple and centralized stockpiles of ore will be located at the southern edge of the pit in the southern area of Section 27. These stockpiles will be constructed based upon ore grade and plant needs. The improved roadway will extend north from Beede Desert to this stockpile area. As operations expand at the Eagle Mine additional stockpile pads may be required. Also, the exact size and number of ore stockpiles will vary from year to year; this is because the size and number of stockpiles will be dependant upon the amount of Eagle Mine ore required during a particular mining season. Due to the high moisture content of the un-oxidized ores, the stockpiles

[84] Appendix article 17 of the Eagle Mine Operating area

constructed at the Eagle Mine will be constructed in such a fashion as to aid evaporation by use of natural air flow and solar heating.[85]

16.7 Mine and Mineral process waste Stockpiles

Mine waste generated from the Eagle Mine as well as mineral process waste will be deposited in the waste stockpile located in the Eagle mining area. When possible the mine waste and the mineral process waste will be used to backfill portions of the Eagle Mine's Open Pit. The lack of groundwater and limited quantity of storm water runoff from this area will make the Eagle Mine a good location for the deposition of mineral process waste once the Hidden Valley area has been reclaimed. When mining is occurring at the Eagle Mine the mineral process and mine waste will be mixed as they are placed into the waste stockpile. When mining is not taking place the mineral process waste will be deposited into the waste stockpile. EP Minerals will reclaim portions of the waste stockpile as often as possible to combat fugitive dust emissions.[86]

Mining operations will likely commence in the northern portions of the pit first. The mine waste from these areas will be stockpiled in close proximity to the pit. Once the pit has reached the lower extent of the ore body mining will advance to the south and west. As this occurs, the mine waste as well as mineral process waste will be deposited in the Eagle Mine waste stockpile. This stockpile will fill in the north-east portion of the Eagle Mine Pit.[87]

16.8 Reclamation

Reclamation of the Eagle Mine will follow the same procedure as in all other working areas of the Celatom Mine Complex. When the topsoil is removed at the start of mining it will be stockpiled for use in the reclamation process. All slope angles, other than final pit walls, will be reduced to an average slope of 3:1 or less and covered with topsoil and seeded with the appropriate seed mix. Benches in final pit walls will be covered with soil and seeded when possible. Haulage roads and other disturbed areas will also be seeded. The improved roadway leading to the Eagle Mine will be donated to the BLM.

17.0 Section 25

Section 25 sits directly north of the Section 36 open pit mine and directly west of the Kelly Field Mine. EP Minerals owns the southern 480 acres of this section. That acreage is comprised of 160 acres of private land owned by EP Minerals and 260 acres of Stock Raising and Homestead Act land. At this time there are no plans to engage in mining activities on the Stock Raising and Homestead Act ground, but future expansion may indicate satisfactory ores are present. The ore deposit that is currently being

[85] Appendix article 62 Rock Characterization and Handling Plan
[86] Appendix article 32 of the Celatom Dust Control Plan
[87] Appendix article 17 of the Eagle Mine Operating area. Appendix article 62 Rock Characterization and Handling Plan

mined in both Sections 36 and Kelly Field runs through the south-east portions of Section 25. Future pit expansion of Section 36 and Kelly Field is probable into the Section 25 area.

17.1 Location and Access

Section 25 sits adjacent to the north side of the Section 36 working area and adjacent to the west side of the Kelly Field operational area. This area would be accessed via unimproved mine haulage roadways. As this is currently private ground public access to public ground will not be affected.[88]

17.2 Geologic Conditions

The Geologic conditions present in Section 25 are very similar if not identical to those found in Section 36 and Kelly Field.[39] ok? The diatomite deposit is one large formation which narrows as it passes through the south east portion of Section 25. The DE deposit is located above the basaltic and andesitic rock formations that are thought to be the bottom of the deposit. The topography of the lake bed is not fully known, but it is variable due to the depositional environment and the erosional activities that have occurred before the deposition of the diatomite. The overall dip angle in Section 25 is believed to be 10 to 15 degrees with a strike of 195 degrees.[89]

17.3 Ore

The diatomite ore body in Section 25 is part of the larger ore body with rund from Section 36 in the south up through Kelly Field and into North Kelly Field. Topsoil thicknesses range from 5 to 25 feet with overburden ranging in thickness from 5 to 45 feet. The ore deposit is very thick in places. As in Section 36 and Kelly Field all types of ore are found in Section 25. Additional drilling will better define this ore zone. This drilling will occur on EP Minerals private ground in the south-east ¼ of the section and should be completed by 2010.

17.4 Storm Water Control and Pit Dewatering

Mining in Section 25 will most likely occur as the Section 36 pit advances north into Section 25. Eventually this open pit will enter the south-western areas of Kelly Field. As this occurs, interceptor ditches will be emplaced to prevent surface water from entering the mine workings. All storm water runoff from the pit will be diverted into appropriate sized sediment basins either in Sections 36 or 25. As in all other working areas pit dewatering will only occur when necessary. Allowing any pit ponds to evaporate will continue to be the practice. DOGAMI will be notified and updated on the installation of sediment basins and water quality in Section 25. If pit dewatering is

[88] Appendix article 15 for Section 25 Operating area

[89] Appendix article 7 for geologic map of area.

necessary, the pit water will be monitored to ensure pH values between 5.0 and 7.5; corrective action will be taken as required as described in Section 5.2.

17.5 Mining Methods

Open pit mining methods will be utilized in Section 25. This will involve the following systematic sequence of events: 1) Exploration (this phase has been completed), 2) Development (utilizing drilling to further delineate the ore body for mine planning purposes), and 3) Mining (extracting ore from the ore in Section 25.). The mining phase will be the longest phase of the process and is expected to last approximately 8 to 10 years. Although the bottom extent of the deposit has not yet been determined, the pit is expected to expand downward a minimum of sixty to one-hundred feet from the current surface topography. The exact extent and depth of the pit will be dependent upon the geologic conditions encountered once mining commences. Any waste stockpiles constructed will be done so with an average slope of 3:1 in accordance with DOGAMI specifications.

17.6 Ore Stockpiling

The diatomite ore excavated from the Section 25 area will be stockpiled either in Section 36 or in the Kelly Field operating area. This material will then be hauled either be EP Minerals or a sub-contractor to our processing facility west of Vale OR. The number, size, and location of stockpiles will vary with the demand for ores from Section 25. Due to the high moisture content of un-oxidized ores, the stockpiles will be constructed in such a fashion as to aid evaporation by use of natural air flow and solar heating.

17.7 Mine and Mineral Process Waste Stockpiles

The mine waste generated from the open pit operations in Section 25 will be deposited in the Section 36 main pit waste stockpile, used as backfill in the Section 36 pit, or stockpiled in close proximity to the pit in Section 25.[38] Mine waste only will be used to backfill the Section 25 pit in order to prevent a permanent pit pond from developing. In the event a mine waste stockpile is required in Section 25 it will be located on EP Property.

17.8 Section 25 Reclamation

When mining activities have come to an end, and the ore body in Section 25 has been depleted of quality ore the reclamation process will begin. Due to the nature of the pits it is probable that a final pit wall will remain in Section 25. DOGAMI will be consulted concerning the final pit wall and EP Minerals will construct and reclaim these features to DOGAMI specifications. At this time the overall angle of any final wall can not be estimated. All other features will be reclaimed in accordance with DOGAMI specifications.

18.0 Vines Hill Stockpile Area

18.1 Location and Access

Located approximately 13.5 miles southwest of Vale Oregon off of US Highway 20 in Section 33 Township 19S Range 43EWM are seven mill site claims held by EP Minerals (Osage Mill Site Nos. 1-7) which is known as the Vines Hill Stockpile Area. This area is accessible via a BLM approved road that was constructed by EP Minerals in 1986. At this location, raw diatomite ore is stored in multiple stockpiles for emergency supply of the plant in the event the mine can not be accessed. A sufficient quantity of ore is stored at the Vines Hill location to operate the plant for a period of no less than two weeks. Once all mining ceases, this area will be reclaimed.[90]

18.2 Storm water Control

All storm water runoff from the site will be diverted into an appropriately sized sediment basin located on the eastern edge of Osage Mill Site No. 4. Any accumulated water will be allowed to evaporate.

18.3 Ore Stockpiling

Ore is hauled to the Vines Hill Stockpile Area by over-the-road trucks operated by either a sub contractor or EP Minerals; once the ore is on site, a wheel loader is used to construct ore stockpiles based upon the grade of ore received. The site is composed of multiple ore stockpiles of various grades and quantities that will allow for the operation of the processing plant for a period of no less than two weeks; the exact size and number of ore stockpiles will vary from year to year to match the needs of the market. Typically, the ore stockpiles will be built in the early fall and consumed by the processing plant whenever the mine is inaccessible.

18.4 Dust Abatement

EP Minerals has a dust control plan for the Vines Hill Stockpiling area that is specifically designed to minimize fugitive dust. Operational activities which could result in the emission of fugitive dust are outlined below:

- Road dust generated from the operation of vehicles used to transport ore to and from the site.
- **O**ver **T**he **R**oad trucks (OTR) loading ore into the trailer using a front end loader.
- OTR trucks approaching or departing from the stockpile area.
- Wind erosion of a stockpile due to a storm event.

[90] Appendix article 37 for an aerial photograph of the Vines Hill stockpile

Most of the operationally generated sources of fugitive dust emissions identified are controlled by simple measures which are outlined below.

- Ore will be loaded on the down-wind side of the pile if possible.
- All OTR trucks will be tarped after loading.
- The speed of all vehicles traveling on or near a stockpile will be limited.
- Roadways leading to and from stockpiles will be graveled whenever possible.
- Berms will be built on the down-wind side of the site to prevent the transport of wind blown dust.
- Any accumulations of wind blown dust will be seeded each fall to prevent further transport.

18.5Vines Hill Stockpile Area Reclamation

When plant operations have concluded, and all diatomite ore has been consumed from the Vines Hill stockpile area, the site will be reclaimed.[91] The topsoil that was removed prior to stockpiling will be spread over the area; then the site will be regraded and seeded with a BLM approved seed mix. Any areas outside of the operational boundary containing DE will be reclaimed by broadcast seeding in the Fall with a BLM approved seed mix; this area would be watered, as needed, until the vegetation was firmly established.

19.0 Supplementary Mine Activities

Many other activities occur within the Celatom Mining complex that are not directly associated with the mining process and have not been mentioned as yet in this report. Those items will be coved in this section.

19.1 Winterization

As previously stated, mining operations may be suspended during the winter months. But before EP Minerals shuts the mine down for the winter months, several steps are completed to ensure no problems develop during the winter shutdown.
Prior to shutting down the mine for the season, all active mining and stripping areas are cleaned up and left in a stabilized condition so as to prevent erosion or safety hazards. The drainage and diversion ditches are cleaned out, and reinstalled to enable them to handle the winter and spring storm water runoff. The sediment basins are also inspected and cleaned out if necessary.

All of the buildings and fuel storage tanks are secured to prevent unauthorized access. During the winter months, mine personnel still visit the mine, normally once per week, to ensure that no problems or potential problems are left unchecked for too long. Furthermore, EP Minerals sub-contractor hauls ore from the site throughout the winter

[91] Appendix Articles 54 through 59 for the "2008 Celatom Reclamation Plans" for a detailed review of the reclamation process

months. Their employees have explicit instructions to inform EP Minerals management of any problems observed.

19.2 Grazing Allotments

A majority of the mining activity occurs within BLM grazing allotments.[92] Every effort has been made to minimize any adverse effect on the grazing activities. EP Minerals has and will continue to work with the local ranchers in reference to these allotments.

19.3 Timber Inventory

As previously mentioned in the Kelly Field mine section, there is a stand of Ponderosa pine located in the NW ¼ of Section 30 Township 19S Range 37EWM in Malheur County. In preparation for future mining, a timber inventory was conducted in April of 1995 by Todd M. Hueckman, Forest Inventory Contractor. The report was then reviewed by Jon Reponen, Natural Resource Specialist; Burns District BLM.[93]

EP Minerals will notify the BLM two years in advance prior to cutting or removing any trees from BLM managed lands. The logs may be decked out of the way and the BLM will inspect and sell the logs or approve their disposal by EP Minerals. EP Minerals will call the Burns Interagency Fire Zone dispatch at 541-575-4545 prior to burning any timber or brush to ensure no fire bans are in place and to inform the agency of the controlled fire.

19.4 Noxious Weeds

EP Minerals will inspect for noxious weeds throughout the Celatom Mine Complex during the spring and fall of each mining season. Herbicides will be applied by a certified technician during the spring and fall to limit the spread of noxious weeds and to kill those already established. No herbicides will be stored at the mine site, but they will be transported to the mine from the plant on an as-needed basis.

If weeds are in an area that will be disturbed they will be treated prior to disturbance of the area and the area will continue to be monitored for weeds after disturbance takes place.

Early detection and rapid response is critical to gaining and keeping control of noxious weed populations before they get to an unmanageable level. EP Minerals Weed Program is to continuously survey active areas of the mine, roadways and other travel corridors such as livestock paths, taking the appropriate action immediately when weeds are found. EP Minerals employees will coordinate their efforts with the Harney County weed specialists and the BLM weed control agent.

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[92] Appendix article 52 for location of grazing allotments
[93] Appendix article 53 copy of the timber inventory report

19.5 Stock Raising Homestead Act

Under the special procedures of the Public Law 103-23 which is the Stock Raising Homestead Act Amendment of April 16, 1993, mining claims may be located.[94]

When public lands are sold or exchanged, mineral rights may be either severed or reserved to the United States government; this depends upon whether the land use planning decision expressly restores the land to mineral entry, and BLM publishes a notice to inform the public. Split estate land, with nonfederal surface estate and federal mineral estate in an area that is not Stock Raising Homestead Act land, is not available for mineral entry.

19.6 Mine Safety and Health Administration

All operations conducted within the confines of the Celatom Mining Complex fall under the jurisdiction of the Mine Safety and Health Administration. MSHA is charged with insuring that all mines operating inside the United States follow all applicable regulations under 30 CFR. If at any time work instructions issued by DOGAMI, or the BLM, conflict with MSHA regulations, EP Minerals will require that all involved agencies reach a mutual understanding before any work is completed.

20.0 Summary

The Celatom Mining Complex has been in operation for over twenty-five years. During that time there have been no major accidents, injuries, or environmental incidents at the mine site. The mine site has been recognized by external agencies for its proactive reclamation efforts. EP Minerals has every intention of continuing to operate the Celatom Mining Complex in a safe, environmentally friendly, and efficient manner. As additional reserves of diatomite ore are located on public lands EP Minerals will use those materials to supply the minerals industry with high quality diatomite products used throughout the world. These products benefit society by maintaining our high standard of living, while keeping jobs within the United States of America. EP Minerals is proud to operate a safe and efficient mine in eastern Oregon and would like to thank all of its employees for making each and every year a success at the Celatom Mine.

[94] Appendix article 6 for map showing land ownership in the area of the Celatom Mining Complex.

22.0 Appendix

Appendix Table of Contents

1. Involved Agency Contact Information
2. State of Oregon
3. Location of Celatom Mining Complex
4. Celatom Mine Complex Map
5. Mining Claims
6. Land Ownership Map
7. Geologic Map of the area
8. Raw Diatomite ore
9. Diatomite as seen under a microscope
10. Tables 1.0 & 2.0
11. Beede Desert Operating Area
12. Section 36 Operating Area
13. Kelly Field Operating Area
14. Hidden Valley Operating Area
15. Section 25 Operating Area
16. North Kelly Field Operating Area
17. Eagle Mine Operating Area
18. MPO Roads
19. Beede Desert Aerial
20. Hidden Valley Aerial
21. Section 36 Aerial
22. Kelly Field Aerial
23. Section 25 Aerial
24. North Kelly Field Aerial
25. S36 Generator Shed
26. Water well permits
27. Location of water wells
28. Fuel island
29. Lube oil island
30. Generator fuel containment
31. SPCC Plan
32. Dust Control Plan
33. Harney Co. Roadway & Culvert spec.
34. U-80 Cattle guard spec.
35. 30 CRF Part 56
36. Drill hole abandonment
37. DOGAMI Exploration permit
38. Vines Hill Operating Area
39. Ore loading
40. Mining equipment in use
41. Hidden Valley sediment basin calculations
42. Hidden Valley Contour
43. Finished Products
44. Operating Permits
45. Reclamation test plot
46. Test plot fence specifications
47. Section 36 Contour
48. Kelly Field High-wall Failure
49. Kelly Field High-wall contour
50. Kelly Field contour (Map)
51. Kelly Field contour (Oblique)
52. Hidden Valley Expansion area
53. Timber inventory
54. Riparian Impact Areas.
55. Beede Desert reclamation calculations
56. Section 36 reclamation calculations
57. Kelly Field reclamation calculations
58. Vines Hill reclamation calculations
59. Well abandonment reclamation calculations
60. 2010 SRK Baseline Characterization Report.
61. Highwall Management Plan
62. Stockpile and Rock Characterization Report
63. Celatom Surface & Groundwater Sampling Plan