Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor

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September 7, 2006

Dear Reader:

Enclosed for your review and comment is the Draft Environmental Assessment (EA) for an operating permit requested by Apex Abrasives of Missoula, MT on January 31, 2006 from the Montana Department of Environmental Quality (DEQ), Environmental Management Bureau in Helena and the Bureau of Land Management (BLM) in Dillon, MT. The operating permit is for the Glen Tungsten Mill Tailings Project near Glen, MT. The old Glen tungsten mill tailings contain garnet sand useful for abrasive products. The tungsten mill tailings area located 2 miles north of Glen, MT and about ¾ of a mile west of Interstate 15.

This Draft EA evaluates the potential impacts from the proposed reprocessing operation. The DEQ and BLM must decide whether to approve the permit as proposed, deny the request for an operating permit, or approve the operating permit with modifications.

The Draft EA addresses issues and concerns raised during public involvement and from agency scoping. The agencies have decided to approve the permit with modifications as the preliminary preferred alternative. This is not a final decision. This conclusion may change based on comments received from the public on this Draft EA, new information, or new analysis that may be needed in preparing the Final EA.

Copies of the Draft EA can be obtained by writing DEQ, Environmental Management Bureau, P.O. Box 200901, Helena, MT 59620, c/o Herb Rolfes, or calling (406)444-3841; or sending email addressed to hrolfes@mt.gov. The Draft EA will also be posted on the DEQ web page: www.deq.mt.gov. Public comments concerning the adequacy and accuracy of the Draft EA will be accepted until September 28, 2006.

Since the Final EA may only contain public comments and responses, and a list of changes to the Draft EA, please keep this Draft EA for future reference.

Warren D. McCullough

Warren D. McCullough, Chief
Environmental Management Bureau

9/7/06

Date

HR/sf

File: pending Apex Abrasives

EMB\OP_Applications\ApexAbrasives\EACoverletter

DRAFT ENVIRONMENTAL ASSESSMENT

APEX ABRASIVES

APPLICATION FOR AN OPERATING PERMIT

Prepared by

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

ENVIRONMENTAL MANAGEMENT BUREAU

And the

BUREAU OF LAND MANAGEMENT

August, 2006

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CHAPTER 1
INTRODUCTION/PURPOSE AND NEED

1.0 INTRODUCTION OF PROPOSED ACTION

The Montana Department of Environmental Quality (DEQ) received an application January 31, 2006 from Apex Abrasives for an operating permit for reprocessing the Glen tungsten mill tailings, located in Beaverhead County, 20 miles north of Dilllon, MT (Figure 1). The application describes a Proposed Action that would result in the recovery of garnets from the Glen tungsten mill tailings. Approximately 972,000 tons of ore were processed at the site, most in the 1950's, with additional amounts through the 1970's. The proposed operation would remove approximately 90 to 200 tons per day, and have an operational life of 10 to 15 years. The permit area would be about 90 acres, but only a portion of that acreage would actually be disturbed at any one time as mining progressed from pond to pond with concurrent reclamation. The plant facilities would occupy about 2.8 acres.

The tailings would be removed from tailings impoundments with a wheel loader. Maximum depth of the impoundments is about 30 feet. The tailings would be washed, separated and sized. Only water would be used in the washing process. The wash plant would discharge waste fines and waste water into one of the existing evaporation ponds (TP-5) remaining from the tungsten milling operation. Some of the water may be recirculated back to the plant, or potentially used for sprinkler irrigation of new vegetation. The product would be bagged and sold.

Removal of tailings would begin at one of the two impoundments that contain tailings and were not covered with borrow material and revegetated (TP-2 and TP-3). The other three impoundments that contain tailings (TP-1, TP-4 and TP-11) would have the borrow material removed as needed. This soil material would be stockpiled and revegetated until needed for final reclamation. Since the tailings were deposited directly onto the original soil surface, removal of tailings should expose additional soil and reduce the amount of required soil covering.

The site is on Federal land administered by the Bureau of Land Management (BLM) except for the east end of the lowermost evaporation pond. This area is private land that would not be disturbed as part of the Proposed Action except for construction of a water well. Apex Abrasives holds two unpatented placer claims covering the mill site and ponds. The access road on the north side of the site is on BLM land but the USFS has a reservation on the road in Sections 4 and 5. The operator would be required to obtain a road use agreement with the USFS. There are also a number of right-of-ways in the area, such as power lines, phone lines and roads, but they are not expected to be affected by the proposed operation.

There are three residences near the proposed permit area, located northwest, south and east of the project area. The residences all have wells. Groundwater flow is from west to east. A well would be drilled on private land east of the proposed project area to provide water for processing.

Mine permitting and compliance activities on private and public land within the State of Montana fall under the jurisdiction of DEQ, principally under the provisions of the Montana Metal Mine Reclamation Act (MMRA) and the Montana Environmental Policy Act (MEPA). DEQ has reviewed the proposed application in consultation with the BLM. The BLM has reviewed the Proposed Action for compliance with the Federal Land Policy Management Act and the National Environmental Policy Act (NEPA).

This EA describes the proposed plan of operations and reclamation plan. This joint agency Environmental Assessment (EA) evaluates the potential impacts of the Proposed Action pursuant to MEPA and NEPA. The EA also looks at the consequences of two alternatives to the Proposed Action: 1) the No Action Alternative (denying the Proposed Action) and 2) Approval of the Proposed Action with Agency Modifications.

Chapter 1 describes the purpose of and need for this action, the role of DEQ and the BLM and concerns and issues. Chapter 2 provides a historical perspective of mining at the site, and a description of the Proposed Action and alternatives. Chapter 3 describes the affected environment. Chapter 4 analyzes potential direct, indirect and cumulative effects associated with the Proposed Action. Chapter 5 identifies the coordination with state and federal agencies that occurred during preparation of this EA and contains a list of those who prepared the EA. Chapter 6 contains a list of references cited in developing the EA.

1.1 PURPOSE AND NEED FOR PROPOSED ACTION

Apex Abrasives proposes to rework the existing tailings found in five impoundments, processing approximately 90 to 200 tons per day. Maximum depth of tailings is estimated to be 30 feet. The wash plant would discharge waste fines and waste water into the existing evaporation pond. Some of the water may be recirculated back to the plant, or used for sprinkler irrigation of new vegetation. After the tailings are removed from the two unreclaimed impoundments, the operator would proceed to the three tailings impoundments that have been reclaimed. The soil cover would be removed, stockpiled and seeded, awaiting final reclamation. The reprocessing of the tungsten tailings would expose the original ground surface and soil horizon, possibly providing an additional source of soil for final reclamation. The wash plant would not use any chemicals.

1.2 AUTHORIZING ACTIONS

An application for a permit submitted to DEQ may be approved only after a review of the proposal with respect to the reclamation and closure plan as required by MMRA and after an environmental analysis is completed as required by MEPA. DEQ is responsible for protecting air quality under the Clean Air Act of Montana and water quality under the Montana Water Quality Act. DEQ decision options upon completion of the EA include: (1) denying the application, the No Action Alternative, if the proposed operation would violate MMRA, the Clean Air Act, or the Water Quality Act; (2) approving the Proposed Action as submitted; (3) approving the Proposed Action with agency modifications or stipulations designed to mitigate identified environmental impacts or 4) requiring an environmental impact statement (EIS) to be completed to disclose and analyze potentially significant impacts.

DEQ and the BLM would jointly calculate the amount of a performance bond. The purpose of the bond is to ensure fulfillment of obligations under mining reclamation laws and to ensure the availability of funds in the event of a default by the operator. The posting of the performance bond payable to the State of Montana and BLM is a precondition to issuing of a permit. The amount of bond is based upon the estimated cost of reclaiming the disturbed land, abating pollution and completing any other work described in the reclamation plan. DEQ would review the bond annually per MMRA requirements. DEQ is required to thoroughly review the bond every 5 years under MMRA (82-4-338, MCA). The BLM would consult on the bond reviews.

1.3 RELATIONSHIP TO DEQ POLICIES, PLANS, AND PROGRAMS

The Proposed Action has been reviewed for compliance with DEQ policies, plans, and programs. The application has been reviewed by DEQ and the BLM for deficiencies and completeness. The application is now complete.

1.4 ISSUES STUDIED IN DETAIL

The issues studied in detail for this report concern the specific environmental changes that would result from the Proposed Action.

1) Reprocessing of tungsten tailings.

2) Impacts to surface and ground water

3). Public Nuisance (dust, noise, and haul roads)

1.5 ISSUES CONSIDERED BUT DISMISSED

DEQ has identified resources that would not be affected by the Proposed Action and issues that were considered and eliminated from further review.

1.5.1 GEOLOGIC HAZARDS

There is no potential for landslides, mass wasting, or other stability concerns on the site.

The mill tailings consist principally of andraditic garnet with small amounts of marble and silicate minerals. The garnet is chemically inert and hard. There is essentially an absence of acid generating sulfides. Testing has shown the tailings to be strongly basic, with a pH value between 8.0 and 9.9 (AEPCO, 1986). This basic pH would greatly reduce the potential for acid generation or metal mobilization.

Detectable amounts of copper, manganese, vanadium and tungsten were found in the tailings. The amounts are several orders of magnitude less than published toxicity threshold values (AEPCO, 1986). The copper mineral was originally chalcopyrite and has oxidized to the stable

mineral malachite. Manganese is a minor element in garnet. Tungsten is present as scheelite. Scheelite is relatively stable, but would be recovered as product during processing.

1.5.2 WILDLIFE

The project area is sparsely vegetated and has little forage or shelter to wildlife although used by a few white-tail and mule deer. There are some jackrabbits, cottontail rabbits and small ground squirrels. Occasionally coyotes and badgers pass through the area. There are no known endangered or threatened species in the proposed permit area (MNHP, 2006). There are four species of concern and six ecological sites in the surrounding area. Avian habitat is sparse. There are no raptors in the nearby vicinity. Ferruginous hawks have been observed over a mile away from proposed activities. There are no known or suspected nesting sites of threatened or endangered avian species (Bump, 1987).

The area has small wetlands associated with local springs upgradient of the mill tailings ponds. There are no fisheries or aquatic habitats in the proposed permit area.

1.5.3 LIGHTS

The mine would run only one shift per day, 5 days per week. The operation is seasonal and would not operate during months with short days and cold temperatures, usually November through March. As a result, impacts from lights on the neighbors should not be an issue.

1.5.4 CULTURAL RESOURCES

A review of historical or archaeological values in the proposed permit area was completed (SHPO, 2006). No known sites should be disturbed. Additionally, the site was examined and reclaimed by the BLM and other government agencies in the 1980's and 1990's (SHPO, 2006). In the event any resources are found, the BLM would be immediately notified. The existing mill structures will not be disturbed.

CHAPTER 2
HISTORICAL MINING, DESCRIPTION OF THE PROPOSED ACTION, AND ALTERNATIVES

2.1 The No Action Alternative

If the permit is denied the site would remain in its current condition as described in the following sections.

2.1.1 LOCATION AND LAND USE

The site is located about forty miles south of Butte, MT. The Beaverhead County seat is Dillon, MT about twenty miles to the south. More specifically, the tungsten mill site is located between Kambich Springs and Sassman Gulch, about three quarters of a mile west of Interstate 15, and about two miles north of the village of Glen, MT (Figure 1). Access to the site is via the frontage road that begins at the Glen turn-off from Interstate 15.

The BLM administers the land within the proposed permit boundary. Although vegetation is sparse, the area surrounding the proposed permit area is used as grazing for domestic livestock. Currently, the BLM has fenced out livestock from the proposed permit area. One residence is located about half a mile northwest of the project area, and one about the same distance to the south. Another is located about a quarter of a mile to the east (Figure 1).

2.1.2 MINERAL AND SURFACE OWNERSHIP

The site is on Federal land administered by the BLM except for the east end of the lowermost evaporation pond. This area is private land that would not be disturbed as part of the Proposed Action, except for a well that is proposed to be constructed. Apex Abrasives holds two unpatented placer claims covering the mill site and impoundments.

2.1.3 GEOLOGICAL SETTING

The project area is located on interbedded clay, and coarse gravels of Tertiary age Bozeman Group sediments (Ruppel, 1993). These sediments form a terrace on the west side of the Big Hole Valley. They were derived from older calcitic sediments located to the west and form the east flank of the Pioneer Mountains. More recent (Quaternary) sediments fill the Big Hole Valley. Poorly formed caliche or calcium carbonate cemented layers within the terrace gravels indicate a long period of stable, near desert conditions which remains to the present.

2.1.4. HISTORY OF THE MILL SITE

The tungsten mill was constructed by Minerals Engineering Company, of Grand Junction, Co. in 1950 to process tungsten ore from mines in the nearby Pioneer Mountains. The mill processed about 728,000 tons of ore prior to the US Government's termination of the Strategic Minerals Stockpile Program in 1957 (Geach, 1972). It operated intermittently thereafter for a few years

and was then dismantled only to be rebuilt and operated by General Electric Corporation in the late 1960's and early 1970's. General Electric subsequently dismantled the mill due to depressed tungsten prices in the late 1970's, after processing an additional 243,832 tons of ore (McCulloch, 2005). There has been no milling activity onsite since. Total recorded ore processed is about 971,800 tons.

The tailings ponds were dried out by the 1980's and became a source of wind-born dust. As a result of complaints from neighboring land owners, the BLM attempted to control the wind erosion in 1986. This started a chain of studies, investigations, assessments, and partial reclamation that was finally completed by 1999. It has been the subject of testing and reports by AEPCO of Bethesda, Maryland, Hydrometrics of Helena, Montana, the Montana Bureau of Mines and Geology (MBMG), and the BLM (AEPCO, 1986, Hydrometrics, 1989, MBMG, 2005, and BLM, 1997).

AEPCO (1986) investigated the tailings, surface and ground water and stated in their report that "there is no reason to believe that hazardous wastes or other hazardous substances have been generated, treated, stored, or disposed on the site." Monitoring ceased after 1999 (Marvin, 1999). The DEQ sampled three wells and one spring in the area in June 2006 (Figure 2).

The mill site and tailings ponds were located as association placer claims in 2002 by E.E. Nelson and Associates. They are now held by lease to Apex Abrasives Corp., a Montana Corporation. Apex Abrasives has completed process testing.

2.1.5 SocioEconomics

Historically the area has been characterized by a ranch and livestock economy. The terrace on which the project is located had been largely uninhabited, and never homesteaded. That changed when Minerals Engineering Co. built the tungsten mill. Over one hundred people were employed and Minerals Engineering Co. became one of the largest private employers in Beaverhead County. Consequently, the area's economy and tax base received a boost until falling tungsten prices forced the mill closure and dismantling. Except for when General Electric briefly operated the mill, Beaverhead County's economy has reverted to a ranch economy, with those prevailing wages.

Due largely to lack of employment opportunities, Beaverhead County has a migration of younger workers out of the county. The state median age is about 27.0 years. Adjacent Madison County has a median age of 34.6 years. Beaverhead County has a median age of 26.9 years, however, if not for Western Montana College it would have a median age similar to Madison County. Dillon had a population of 4,035 and Beaverhead County's population was 8,950 in 2004.

2.1.6 EXISTING FACILITIES AND OPERATIONS

2.1.6.1 Milling Operations

The tailings dams and evaporation ponds have existed since the 1950's. They were designed as a series of cascading dams for impounding tailings, with a series of evaporation ponds located

below for disposal of excess water and wash-out safety. The impoundments have never been known to discharge. The dams were built by transporting adjacent hillside terrace material to form dams across dry drainages. It is proposed to excavate the tailings from behind five of these dams. The tailings-filled ponds have berms from 5 to 21 feet high that would contain all runoff. Maximum depth of tailings is estimated to be 30 feet.

2.1.6.2 EXISTING OPERATIONS

Currently, there are no operations at the proposed site.

2.2 Proposed Action Alternative

Apex Abrasives submitted an application for a permit on January 31, 2006. The agencies sent a deficiency letter on March 3, 2006. Apex Abrasives responded on May 15, 2006. On June 13, 2006, the agencies declared that the application was complete and started the environmental analysis (EA) process. The application and responses to the deficiency letter are the Proposed Action described in this chapter. If the application is approved, the permit application would be revised to address the findings and recommendations of this EA.

Apex Abrasives proposes to rework the existing tailings found in five impoundments, processing approximately 90 to 200 tons of tailings per day for 10 to 15 years depending on market conditions. Tailings would be removed from the impoundments with a wheel loader. Maximum depth of the impoundments is about 30 feet. The tailings would be washed, separated and sized. The wash plant would discharge waste fines and waste water to one of the existing evaporation ponds (TP-5) remaining from the tungsten milling operation. Some of the water may be recirculated back to the plant or used for sprinkler irrigation of new vegetation. After the tailings from the unreclaimed tailings impoundments are removed the operator would begin removing tailings from the three impoundments that have been reclaimed. The soil cover would be removed, stockpiled and seeded, awaiting final reclamation. The reprocessing of the tungsten tails would expose the original ground surface and soil horizon, possibly providing an additional source of soil for final reclamation. The wash plant would not use any chemicals. Residual organic compounds from tungsten beneficiation are anticipated to be present within the tailings and process water. The product would be bagged and sold.

2.2.1 Tailings Reprocessing

The tailings would be fed to jigs for washing and concentration, and then further washed, concentrated and sized with a hydrosizer. After drying, garnet would be separated from the concentrate by a magnetic separator, then finally screened and bagged. The process would use only water. The project would remove approximately 70% of the mill tailings via processing.

Life of the operation is estimated to be 10 to 15 years depending on market conditions. Operational life could be extended by reprocessing garnet tailings from other potential tungsten mines located on the east slope of the Pioneer Mountains. However, these tailings could not be reprocessed without further environmental review.

It is planned to discharge the unusable material back to the existing ponds. These ponds were constructed over 50 years ago by transporting terrace gravels from the adjacent hillsides to form dams across a series of shallow dry drainages. Tailings were then discharged directly onto the soil surface. There is no evidence of past dam failure. The dams are currently vegetated and are not eroding. The distribution of grain size suggests that most ponds were filled by discharging tailings into the upper end of the ponds. It is planned to leave at least a 10-foot buffer of undisturbed tailings next to the dams. It appears the ponds were designed to decant to a lower pond for evaporation and seepage of water. The dams would be monitored on a daily basis. The empty evaporation ponds, Ponds TP-5 and TP-8 would serve as safety ponds in the unlikely event of dam failure. It is planned to initially discharge fines and wash water from the reprocessing of tailings in ponds TP-2 and TP-3 into empty pond TP-5. When pond TP-2 or TP-3 is empty, all discharge fines and water would be directed to TP-2 and TP-3.

Pine and tall oil (a byproduct of paper processing) were used as flotation agents in processing tungsten from the tailings. Pine and/or tall oils may be encountered in the tailings. These oils would not pose a problem for reprocessing the tailings. Pine oil-rich tailings could be either left in place or removed to an existing concrete slab for aeration. Pine oil-contaminated water may also be treated by circulation through an activated carbon column, although this treatment may not be necessary.

2.2.2 Access and Haul Roads

The site is accessed from Interstate 15 via the Glen turnoff. Access is then to the south on the Sugarloaf Mountain frontage road, then westward on a gravel road across one quarter mile of private land easement, then across three quarters of a mile of USFS administered road. This gravel road serves as access to three residences, located northwest, south and east of the project area. In the past, the road served as access for eighteen-wheel trucks to the tungsten mill. The existing roads are adequate for the proposed processing operation. Some gravel would be purchased from a commercial supplier to be placed around the mill buildings. About 400 cubic yards of gravel would also be used to upgrade the access road from the BLM road to the mill. The access road would be bladed and maintained at a 12 to 15 foot width.

2.2.3. Storm Water Handling Facilities

The tailings impoundments have been onsite for over 50 years without a failure from storm water. The operation of the tungsten mill at this site provides a track record of the impoundment's hydrologic behavior. This experience demonstrates that evaporation and seepage consume all water discharged from the mill. Small amounts of water accumulate in the evaporation ponds in the winter months but quickly disappear with warmer weather.

There would be no surface water discharge from the permit area. Process water would be recirculated to the ponds, with losses due to evaporation and potentially seepage to groundwater. In the event a discharge is required to maintain pond capacity, sprinkler irrigation on the reclaimed revegetated impoundments and a private pasture is planned. Presumably there was seepage from the impoundments in the past. No evidence of seepage contamination was found

in neighboring wells (Marvin, 1999). Recirculation, evaporation and seepage would prevent stagnant water from forming in the ponds.

2.2.4 Support Facilities

All new buildings and equipment brought in would be removed from public lands at the site after termination of operations and all new roads would be recontoured and seeded. The existing mill foundation and footings would remain. New buildings would be painted earth-tones to blend in with the surrounding topography.

2.2.5 Energy Supply and Source

Electric power from Vigilante Electric Cooperative is available at both the north and east margins of the project area. A power drop with transformers is present at both locations which service residences. The mill was formerly serviced with this power. A north-south transmission line crosses the west end of the project area. This line was present during milling and was not affected by operations. Vigilante Electric would determine the best route and would secure the easements.

Vigilante Electric Cooperative will obtain a separate right-of-way for a 7.2 kV line to the mill. The line is proposed to originate at the existing power line north of the project area. The new line will run approximately 350 feet south where it will enter the project boundary. It will then turn east and run parallel to the north fence for approximately one half mile. From there it will turn south to the mill.

2.2.6 Solid Waste Disposal

Solid waste, such as pallets, tires, etc., would be taken to the county landfill. Existing solid waste would be removed. The only solid waste remaining would be reject material from processing. This would be discharged back into the tailings impoundments and then covered with soil. Debris created during dismantling of facilities would be removed in a manner that complies with local and state ordinances.

2.2.7 Dust and Emissions Control

Dust from exposed tailings has been a nuisance in the past. Areas of exposed tailings would be minimized and kept moist. Cover with soil material and revegetation would be completed as soon as possible after excavation. Traffic would be light and normally only during daytime hours.

2.2.8 Water Supply System

Water would be obtained from a well near the former water storage pond and/or from a well to be drilled in the bottom of the lower evaporation pond (TP-8). Water consumption is estimated as follows:

Excavation site – Intermittent 10 gpm (dust suppression)
Processing – 60 gpm (processing would use recirculated decant water)
Total make-up water needs – 30 gpm
Total water consumption –Up to 30 gpm

Water usage would not be continuous, but only occur when the processing facility was in operation. Total annual water consumption is estimated at eight acre-feet per year.

2.2.9 Noise

The largest piece of equipment on site would be the wheel loader which would be muffled. The only irritating noise would be back-up alarms which are required by MSHA. During construction, a small dozer would be used for plant site preparation and several redi-mix trucks would deliver concrete.

2.3 RESOURCE MONITORING

2.3.1 Air Quality

Maintenance of adequate vegetation cover has been found by the BLM to be the best prevention of wind erosion at this site. Care would be taken to achieve, expand, and maintain this cover by timely soil covering and revegetation and irrigation if necessary to establish growth. Roads would be watered for dust control.

2.3.2 Water Quality

Water quality monitoring would be conducted twice a year from the well that would be drilled between the filled ponds and the residence southeast of the lowermost pond (TP-8). Also, monitoring of well MW-6 would continue. Analysis parameters would follow EPA requirements for hydrocarbons and metals.

The ground water monitoring plan would continue for two years after processing ends. The monitoring plan is designed to detect possible contamination of water resources.

2.3.3 Cultural Resources

There are no historical or archaeological resources in the proposed permit area. The site was examined and reclaimed by the BLM and other agencies in the 1980's and the 1990's. In the event that any historical or archaeological resources are discovered, the BLM would be immediately notified.

2.4 SOCIOECONOMICS

2.4.1 Duration of Mining

Life of the operation is estimated to be 10 to 15 years depending on market conditions.

2.4.2 Employment

There would be about six full time employees working one shift per day as follows:

Excavating	= 2
Processing	= 3
Tailings disposal	= 1

Total	= 6

The possible five to eight employees needed for the proposed project would come from the local labor pool. The owners/operators of the proposed plan are current and past residents of Beaverhead County.

The proposed project would offer employment to the local labor pool as well as tax contributions without need of additional government services, housing or schools. The project would also provide a market for trucking and other services and products.

2.5 RECLAMATION

2.5.1 Introduction

Reclamation would leave the permit area with a stable vegetation cover that controls dust, similar to the situation before tungsten mining began. Excavation of tailings stored behind the dams would restore some of the original topography within the ponds. All dams are now vegetated and stable and the embankments would not be disturbed. The dams proposed for use as evaporation ponds would be monitored daily for any evidence of failure. Excavated areas and areas that are covered with stockpiled gravelly soil, would be seeded, fertilized, and mulched similar to past successful reclamation efforts by the BLM. This would allow the same current land use after reclamation. Reclamation would be concurrent with removal of tailings and seasonal capability. Noxious weeds are currently being sprayed, an effort that would continue as needed or as requested by the BLM. Buildings and equipment would be removed when no longer needed.

2.5.2 Soil Salvage

Terrace gravels have a very poorly developed soil profile. Past reclamation efforts by the BLM utilized gravels from the adjacent hillsides. Revegetation was successful on both the stripped hillsides and covered ponds. From this past effort, it was found that only the tailings need to be covered with soil. Since terrace gravels are essentially the same material from the surface downward they would only need to be shaped and smoothed prior to seeding.

The impoundments previously covered with terrace gravels would be stripped of cover only as needed for tailings excavation. This soil material would be stockpiled, and replaced as needed during reclamation. The process of excavation would expose much of the original soil surface that was buried by the mill tailings.

The total volume of soil cover material on the three impoundments (TP-1, TP-4 and TP-11) is about 30,000 cubic yards. The current surface area of the two uncovered impoundments (TP-2 and TP-3) would require about 16,000 cubic yards to cover. The area to be covered after tailings removal would be smaller, due to exposure of the buried soil surface. The area that would need to be covered with soil material after tailings removal would be between 50 and 70 percent of the current pond surfaces.

Impoundments TP-2 and TP-3 were not covered during BLM reclamation and would not provide soil for stockpiling. Accordingly, excess soil stockpiled from the other three ponds would be used. All soil stockpiles would be revegetated as soon as possible. Impoundments where tailings are removed would be covered with soil material and revegetated as soon as possible to preclude dust and minimize the disturbed area.

2.5.3 Ore Processing and Surface Support Facilities Reclamation

Excavation of tailings stored behind the dams would restore some of the original topography within the ponds. The dams proposed for use as evaporation ponds would be monitored daily for any evidence of failure. Reclamation would be concurrent with removal of tailings and seasonal capability.

2.5.4 Revegetation

The wheat grass and yellow clover mix drilled by the BLM has established well. This practice would be repeated, but without the yellow clover. Irrigation would be available if necessary to ensure establishment of grass seeding. The site is currently fenced to exclude livestock.

The soil cover would be prepared, seeded and fertilized in a manner similar to that successfully completed by the BLM.

All dams are now vegetated and stable and the embankments would not be disturbed. Future seeding would be monitored for two years.

2.5.5 Soil Placement

Excavated areas and areas that are covered with stockpiled soil, would be seeded, fertilized, and mulched similar to past successful reclamation efforts by the BLM. This would allow the same current land use after reclamation.

Excavation and processing would reduce the volume of tailings by about 70 percent. Accordingly, at least that amount of buried soil would be re-exposed. These re-exposed soils would not need a soil cover. In areas where soil is laid down, there would be a minimum replacement depth of 1.5 feet.

2.5.6 Support Facilities Reclamation

All buildings to be constructed and equipment brought on site would be removed after termination of operations, and all roads would be recontoured and seeded.

2.5.7 Hazardous Materials and Wastes

Solid waste would not be created. The only solid waste remaining would be reject material from processing. This would be discharged back into the ponds and then covered with soil. Debris created during dismantling facilities would be removed in a manner that complies with local and state ordinances.

2.5.8 Spill Prevention, Control, and Countermeasure Plan

Fuel would be required for the dryer and wheel loader, and possibly a small dozer. All fuel storage, 500 to 1,000 gallons, would be within a lined containment. Fueling would be restricted to the containment area.

2.5.9 Human Health and Safety

Human health and safety at the Apex Abrasives Mine would continue to be regulated under MSHA.

2.6 AGENCY MODIFICATIONS TO THE PROPOSED ACTION ALTERNATIVE

Agency modifications were developed in response to substantive issues and concerns identified during scoping and review of the permit application. Agency modifications are intended to eliminate or minimize potential impacts associated with the Proposed Action.

This section lists and describes recommended Agency Modifications to the Proposed Action. Under this alternative, DEQ would approve the Apex Abrasives proposal as modified by the proposed Agency Modifications.

Pine oil and tall oil were used as flotation agents in processing tungsten from the tailings. Pine and/or tall oils may be encountered in the tailings. Pine or tall oil-rich tailings could be either left in place or removed to an existing concrete slab for aeration. Apex Abrasives must modify their water monitoring plan to include annual analysis of water discharged from the wash plant to the settling pond and quarterly analysis of two monitoring wells (MW-6 and a new well) and include copper (total recoverable), specific conductivity, pH, BTEX (benzene, toluene, ethylbenzene and xylene), TEH (Total Extractable Hydrocarbons) and, DRO (Diesel-Range Organics). Additionally, the residence near MW-4 will need to be monitored annually if landowner permission is granted. DEQ may require changes to the monitoring requirements for down-gradient wells if parameters of concern are detected in the settled process water.

Pine oil-contaminated water may be treated by circulation through an activated carbon column, although this treatment may not be necessary. The agencies would require Apex Abrasives to construct a treatment plant if monitoring indicates that migration of organic compounds from the tailings into groundwater would pose a risk to downgradient beneficial uses.

There would be no surface water discharge from the permit area. Process water would be recirculated to the ponds, with losses due to evaporation and potentially seepage to groundwater. In the event a discharge is required to maintain pond capacity, sprinkler irrigation on the reclaimed revegetated impoundments and a private pasture is planned.

Apex Abrasives could not use the lower evaporation pond (TP-8) unless they could secure permission from the landowner, and submitted an amendment to the Plan of Operation and received approval.

Apex Abrasives could not use the old water storage pond, to prevent possible contamination to nearby domestic water wells.

CHAPTER 3
AFFECTED ENVIRONMENT

3.0 INTRODUCTION

Chapter 3 describes resources that could be affected by the Proposed Action. Other resources that either would not be affected by the Proposed Action or are not present in the Apex Abrasives mine area are discussed in Section 1.5.

3.1 POTENTIALLY AFFECTED RESOURCES

3.1.1 VISUALS

The current site is an abandoned mill and tailings ponds that have been partially reclaimed. Removal of the mill tailings would restore some of the original topography. Embankments for the impoundments would remain as would the evaporation ponds. The road would be recontoured and seeded.

3.1.2 WATER QUALITY AND QUANTITY

Seventy percent of the tailings would be removed. Removing tailings may cause some existing pine and tall oil and other constituents of the tailings to become mobilized. Groundwater monitoring would continue for two years after processing ends. The monitoring plan is designed to detect possible contamination of water resources.

There would be no surface water discharge from the permit area. This would be considered a closed system, with decant and recirculation, evaporation and potentially some seepage to groundwater. Seepage to groundwater from the settling pond is anticipated to be on the order of several gallons per minute. In the event a discharge is required to maintain pond capacity, sprinkler irrigation on revegetated land and private pasture would be planned. Presumably there was seepage from impoundments in the past. No evidence of seepage contamination was found in neighboring wells (Marvin, 1999). Recirculation, evaporation and seepage would prevent stagnant water in the ponds.

The only surface water in the area is from springs. Concerns were expressed that the reprocessing could impact area springs and wetlands.

3.1.3 WATER QUALITY AND QUANTITY HISTORY

Sampling and testing of both surface and groundwater was completed under BLM direction between 1987 and 1999, to determine if the mill tailings constituted a hazardous waste. The investigation determined there was no hazardous contamination (BLM, 1997) but concluded that groundwater monitoring should continue for two to three years to assure there was no risk to human health or the environment. By 2004 the BLM had concluded there was no hazard, and sampling was discontinued.

Logs of nearby wells indicate that significant amounts of clay are interbedded within the Bozeman Group sediments. Ground water probably occurs within several water-bearing zones (Ruppel, et.al., 1993). Work by the BLM characterized the ground water flow direction as being from northwest to southeast across the site (Brown, unpublished data 1997). The project area has a hydrologic gradient of 0.06 ft/ft (Marvin, 1999).

In April 1986, AEPCO Inc. analyzed the mill tailings and a composite water sample was taken from three small puddles that were the residual concentrate from evaporation of winter snow melt and rain AEPCO, 1986). The tailings showed no metals exceeding Resource Conservation and Recovery Act (RCRA) standards. The surface water sample, which was a partially evaporated concentrate, revealed detectable levels of copper, manganese, vanadium, and tungsten.

Water from the adjacent and downgradient well was tested (MW-4) in 1993 (Hydrometrics, 1993). The test results showed no metal contamination. The MBMG with assistance from the BLM drilled nine borings at the site in October 1998. With one exception (TP7-1) all borings were placed in tailings ponds. Well TP7-1 was drilled in native materials east of pond TP-4. The MBMG and BLM collected ground water samples at the site in March and November of 1998. During each round of sampling, water levels were measured in the drilled wells and at three additional wells located around the site. This work investigated possible hydrocarbon contamination. It concluded that several samples had small, but detectable amounts of organics related to the pine or tall oil used as a flotation agent during milling. The organics did not exceed state or federal standards (Marvin, 1999). MDEQ sampled three wells and one spring, including a residence well (MW-4) in June 2006. With one exception, samples were taken for diesel-range organics, benzene and metals. Well MW-7, a well in tailings pond 4, was not sampled for metals (Figure 2). The sampling did not indicate water quality problems.

There is no surface water within the permit area. Several small springs are located uphill from the tailings ponds and mill site, southwest of the permit area. Spring flow is variable with season and year, but it is generally estimated between 10 and 50 gpm. Flow disappears within several hundred feet of the spring. The project site is located on a Tertiary (Bozeman Group) bench that formed on the west side of the lower Big Hole Valley. The bench consists of interlayered sand, gravels, and coarse cobbles (BLM, 1997). The bench material appears to be very porous.

CHAPTER 4
CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.0 INTRODUCTION

Consequences of the No Action Alternative, Proposed Action and Agency Modifications to the Proposed Action are identified, described, and analyzed in this chapter. Agency Modifications to the Proposed Action have been identified by DEQ in Section 2.11 for the potentially impacted resources described in this chapter.

Approval of the permit application would allow reprocessing of tailings produced by tungsten mining and milling decades ago. Two of the tailings impoundments do not have a soil cover. Removal of tailings would reduce wind erosion and promote growth of vegetation. Three of the tailings impoundments have been covered with borrow material and have been revegetated. These impoundments would be reclaimed again after tailings reprocessing. The redisturbance of the tailings may mobilize pine and tall oil used in the tungsten flotation mill process. Materials buried in the tailings during previous operations or reclamation may be uncovered. All new structures to be constructed and the existing road would be removed and reclaimed after tailings reprocessing is completed.

4.1 VISUALS, DUST, AND ACCESS ROAD IMPACTS

4.1.1 NO ACTION ALTERNATIVE

The existing site would remain as is. There would be no new disturbance and no further reclamation. The tailings would remain in place. Dust could periodically be produced from the two unreclaimed impoundments and traffic on the access road. There would be no impacts from erosion on the access road or impacts to the cattle guard.

4.1.2 PROPOSED ACTION ALTERNATIVE

The Proposed Action would allow removal of about 70% of the existing tungsten tailings. The facility would be small, and earth-tone paints would be used.

There would be additional dust generated by the process of removing the tailings from the impoundments and along the access and haul roads. The area of exposed tailings at any one point in time would be minimized and the tailings would be kept moist to reduce dust. If necessary, roads would be watered to reduce dust. The operation would be seasonal and not operate from November through March. Dust could be a problem in winter months when the strongest winds occur.

The cattle guard may be impacted on the access road because of heavy loads. Erosion would increase on the access road due to heavier traffic loads than those that exist today. The frontage road is not paved and would be subject to damage from additional traffic in the area.

4.1.3 AGENCY MODIFICATIONS TO THE PROPOSED ACTION

The agencies would require Apex Abrasives to submit a dust control plan for blowing tailings in the wintertime when the strongest winds occur and irrigation is not feasible. Apex would have to submit a concurrent reclamation plan that identifies the mitigations to be used to control dust.

The agencies would inspect the cattle guard and make recommendations for bypassing it with heavy loads or replacing it if needed. The cattle guard would be inspected yearly during operations. The agencies would develop a road maintenance plan with the company to ensure the frontage road is maintained and access road erosion is controlled with best management practices. The access road on the north side of the proposed permit boundary is on BLM land with a USFS reservation. The operator would be required to coordinate with the USFS and obtain a road use agreement.

4.2 WATER QUALITY AND QUANTITY

Redisturbance and reprocessing of the tungsten tailings may cause mobilization of the pine or tall oils contained in the impoundments. Use of water for reprocessing could impact area springs and residential wells.

4.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative the site would remain as is. There would be no additional monitoring, disturbance or reclamation of the tailings impoundments and no impacts to area water resources.

4.2.2 PROPOSED ACTION ALTERNATIVE

The Proposed Action alternative would allow redisturbance of the tailings impoundments that could cause mobilization of pine or tall oils and possibly other contaminants. The proposed groundwater monitoring plan is designed to detect increases in organic compounds associated with pine or tall oils. Pine and tall oil were used as flotation agents to process tungsten. Pine or tall oils may be encountered in the tailings. Groundwater monitoring would continue for an additional two years after processing has ceased. Apex Abrasives did not provide a plan to address potential water quality violations associated with the release of contaminants from the old tailings.

Pine or tall oil-rich tailings could be either left in place or removed to an existing concrete slab for aeration.

Process water would be obtained from a well to be drilled on private property. The springs are all upgradient of the reprocessing operations and would not be affected by milling operations.

4.2.3 AGENCY MODIFICATIONS TO THE PROPOSED ACTION

Apex would be required to submit a quarterly sampling and analysis plan and plan for action if concentrations of organic compounds such as pine or tall oil start to increase in area wells. The water monitoring plan must include annual analysis of water discharged from the wash plant to the settling pond and quarterly analysis of two monitoring wells (MW-6 and a new well to be drilled) and include copper (total recoverable), specific conductivity, pH, BTEX (benzene, toluene, ethylbenzene and xylene), TEH (Total Extractable Hydrocarbons) and, DRO (Diesel-Range Organics). Additionally, the residence near MW-4 will need to be monitored annually if landowner permission is granted. DEQ may require changes to the monitoring requirements if parameters of concern are detected in the settled process water. Response actions could include increases in the frequency of monitoring, monitoring of additional parameters, drilling of additional monitoring wells, initiation of pumpback and treatment of groundwater, providing replacement water supplies for existing water users, and/or suspension of mining operations.

Pine oil-contaminated water may be treated by circulation through an activated carbon column, although this treatment may not be necessary. The agencies would require Apex Abrasives to construct a treatment plant if monitoring indicates that migration of contaminants from the tailings may impact beneficial uses of groundwater.

There would be no surface water discharge from the permit area. Process water would be recirculated to the ponds, with losses due to evaporation and potentially seepage to groundwater. In the event a discharge is required to maintain pond capacity, sprinkler irrigation on the reclaimed revegetated impoundments and a private pasture is planned. Apex Abrasives must submit a plan for where irrigation would occur and the quality of irrigation water that would be used.

Apex Abrasives would only reclaim tailings from five ponds, TP-1, TP-2, TP-3, TP-4 and TP-11. The agencies would require Apex Abrasives to only use TP-5 as an evaporation pond to limit potential impacts from use of TP-8 which is closer to one of the local residences. A new monitoring well would be established below TP-5 to monitor for discharges of contaminants from the reprocessing operation. The agencies would not allow use of the former water storage pond to prevent potential impacts to MW-3 which is used by a local resident for a water supply.

STIPULATIONS:

1. The operator will contact Northwest Energy, owner of a high voltage power line that passes over the project area, alerting them to the proposed operation and working with them to limit possible impacts.

2. The operator will be responsible for posting prescribed signs (speed limits, truck hauling, Stop signs, e.g.) to help ensure public safety, and be responsible for ensuring that all vehicles associated with the operation follow safety rules.

3. The operator will mark all property lines with steel posts and signs, and ensure that disturbance stays on public lands, unless otherwise approved.

4. The agencies will provide the operator with a contingency plan that will require the operator to follow certain procedures if or when contaminated material is encountered.

5. On BLM land the seed mix will need to be adjusted to create more diverse vegetation. The seed mixture used (and which can be used on other lands within the proposed permit boundary) should be:

Bluebunch Wheatgrass	4 lbs/acre
Western Wheatgrass	4.5 lbs/acres
Basin Wild rye	4 lbs/acre
Thickspike Wheatgrass	4 lbs/acre
Flax	2 lbs/acre
Western Yarrow	0.25 lbs/acre

6. Knapweed must be treated until the reclamation bond is released, especially on soil stockpiles.

7. Equipment must be washed before entering and leaving the project area, excluding over-the-road trucks.

8. The concrete pads where trucks will be loaded should be washed off and monitored, removing all knapweed and knapweed remnants. The area should be monitored for new knapweed plants and treated at least annually to keep plants from producing seed.

9. A weed management plan is required by the Beaverhead County Weed Board for any major soil disturbance. The operator will need to abide by this requirement.

4.3 CUMULATIVE IMPACTS

No cumulative affects of the Proposed Action were identified by the agencies as the mill is in a relatively isolated area. No other similar activities are expected. The potential for additional residences in the area is limited. There is potential for future development of additional tungsten mines in the area and running the tailings through the reprocessing plant, but no mines have been proposed.

4.4 UNAVOIDABLE ADVERSE EFFECTS

The Proposed Action would include removal of about 70% of the tungsten tailings from the site, exposing buried soils. Soil used to cap three of the impoundments would be salvaged and replaced. Soil development would be set back and there would be a greater potential for invasion of noxious weeds on these sites.

The landscape characteristics would change as a result of the Proposed Action, with only partially filled impoundments left on the landscape. Although the disturbed areas would be

reclaimed and revegetated, noxious weed species would increase in the area even with efforts made to control weeds on the site.

Dust would certainly increase during operations compared to current conditions even with application of Best Management Practices to control dust, especially in the wintertime when the strongest winds occur.

CHAPTER 5
CONSULTATION AND COORDINATION

5.0 Consultation and Coordination

DEQ and the BLM published a legal notice and press release about the application for operating permit in the *Dillon Tribune* in February 2006. Three letters and phone calls were received. The agencies sent two deficiency letters on the application in March and April of 2006. The application is now complete. Another legal notice and press release will be issued with the Draft EA.

CHAPTER 6
REFERENCES

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FIGURE 2
Monitoring Data
Analytical Results for Water Quality (Organics)

Location	***Date***	***Parameter***	***mg/L ****
MW-2	25-Nov-98	DRO	< 0.56
		TEH	< 0.56
		Volatiles	ND
	18-Mar-99	Volatiles	ND
	3-Nov-00	DRO	< 0.66
		TEH	< 0.66
		Volatiles	ND
Sassman Gulch Spring	28-Jun-06	DRO	ND
		TEH	ND
		Volatiles (BTEX)	
		Benzene	ND
		Ethylbenzene	ND
		Toluene	ND
		m+p-xylenes	ND
		o-xylene	ND
MW-4	19-Nov-93	TPH	< 20 μg/L
		GRO (1)	< 20 μg/L
		GRO(2)	< 20 μg/L
	17-Jul-96	TPH	0.1 mg/L
	25-Nov-98	DRO	< 0.50
		TEH	< 0.50
		Volatiles	ND
	18-Mar-99	Volatiles	ND
	3-Nov-00	DRO	< 0.61
		TEH	< 0.61
		Volatiles	ND
	28-Jun-06	DRO	< 0.30
		TEH	< 0.30
		Volatiles (BTEX)	
		Benzene	ND
		Ethylbenzene	ND
		Toluene	ND
		m+p-xylene	ND
		o-xylene	ND
MW-6	25-Nov-98	DRO	< 0.50
		TEH	2.8
		Volatiles	ND
	18-Mar-99	Volatiles	ND
	3-Nov-00	DRO	0.56
		TEH	0.57
		Volatiles	ND

* Unless otherwise noted
GRO = Gasoline-Range Organics (2 methods used)
TPH = Total Petroleum Hydrocarbons
DRO =Diesel-Range Organics
TEH = Total Extractable Hydrocarbons

Analytical Results for Water Quality (Organics -- continued)

Location	*Date*	*Parameter*	*mg/L **
MW-7	25-Nov-98	DRO	6.0
		TEH	6.9
		Volatiles:	
		Benzene (μg/L)	0.57 J
		CS_2 (μg/L)	1.2
		Cumene (μg/L)	0.17 J
		Cymene (μg/L)	4.9
		Naphthalene (μg/L)	0.32 J
		Toluene (μg/L)	1.5
		Xylenes (μg/L)	0.23 J
	18-Mar-99	*Volatiles:*	
		Benzene (μg/L)	0.37 J
		CS_2 (μg/L)	0.20 J
		Cumene (μg/L)	0.22 J
		Cymene (μg/L)	5.6
		Naphthalene (μg/L)	0.24 J
		Toluene (μg/L)	0.86 J
		1,2,4-trimethylbenzene	0.46 J (μg/L)
		Xylenes (μg/L)	0.24 J
	3-Nov-00	DRO	5.9
		TEH	6.1
		Volatiles	
		Benzene (μg/L)	0.46 J
		Toluene (μg/L)	1.5
		Cymene (μg/L)	2.0
		Naphthalene (μg/L)	0.7
		1,2,4-trimethylbenzene	0.35 J (μg/L)
	28-Jun-06	DRO	7.2
		TEH	7.9
		Volatiles (BTEX)	
		Benzene (μg/L)	0.52 J
		Ethylbenzene (μg/L)	0.29 J
		Toluene (μg/L)	1.0
		m+p-xylenes (μg/L)	0.16 J
		o-xylene	ND

* Unless otherwise noted
GRO = Gasoline-Range Organics (2 methods used)
TPH = Total Petroleum Hydrocarbons
DRO =Diesel-Range Organics
TEH = Total Extractable Hydrocarbons
J = Estimated value. The analyte was present, but less than the reporting limit.

Analytical Results for Water Quality (Inorganics)

Location	*Date*	*Parameter*	*µg/L*	*DEQ Limit***
Sassman Spring	28-Jun-06			
		Barium	47	2000
		Boron	33	N/A
		Calcium	6000	N/A
		Iron	42	N/A
		Magnesium	1500	N/A
		Potassium	420	N/A
		Silicon	1100	N/A
		Sodium	5300	N/A
		Strontium	280	4000
		Zinc	11	2000
		Silver	< 10	100
		Arsenic	< 10	10
		Beryllium	< 10	4
		Cadmium	< 10	5
		Cobalt	< 10	N/A
		Chromium	< 10	100
		Copper	< 10	1300
		Mercury	< 10	0.05
		Manganese	< 10	N/A
		Nickel	< 10	100
		Lead	< 10	15
		Selenium	< 10	50
		Thallium	< 10	0.24
		Vanadium	< 10	N/A
		Tungsten	< 10	N/A
MW-4	28-Jun-06			
		Barium	90	2000
		Boron	31	N/A
		Calcium	3100	N/A
		Iron	190	N/A
		Magnesium	10000	N/A
		Potassium	740	N/A
		Silicon	3500	N/A
		Sodium	17000	N/A
		Strontium	350	4000
		Zinc	< 10	2000
		Silver	< 10	100
		Arsenic	< 10	10
		Beryllium	< 10	4
		Cadmium	< 10	5
		Cobalt	< 10	N/A
		Chromium	< 10	100
		Copper	< 10	1300
		Mercury	< 10	0.05
		Manganese	< 10	N/A
		Nickel	< 10	100
		Lead	< 10	15
		Selenium	< 10	50
		Thallium	< 10	0.24
		Vanadium	< 10	N/A
		Tungsten	< 10	N/A

** Human health-based limits; aquatic life-based limits are lower in most cases.
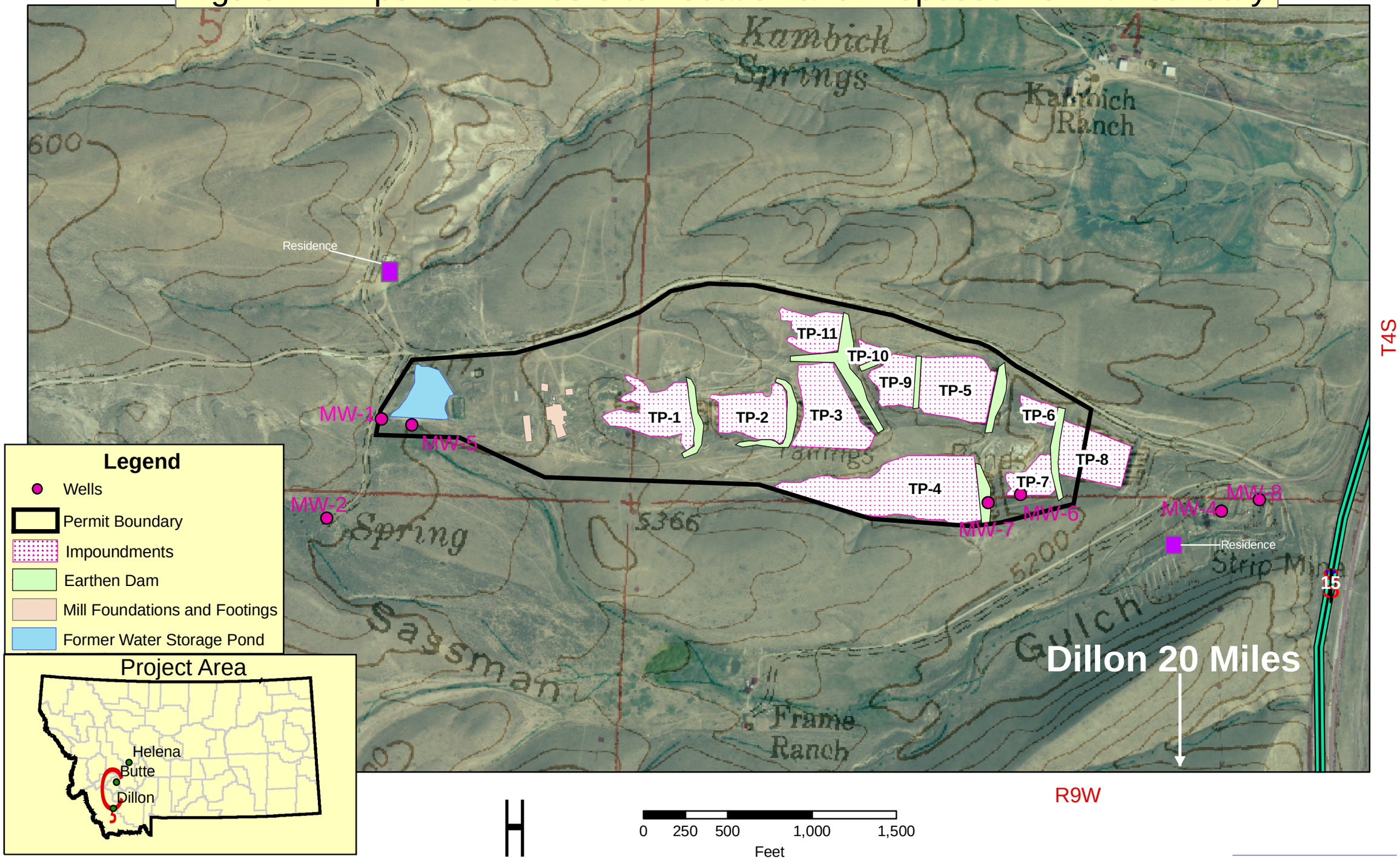
Figure # 1: Apex Abrasives Site Location and Proposed Permit Boundary