CLIMAX MINE
RECLAMATION PERMIT NUMBER 1977-493
TECHNICAL REVISION TR-19

PROPERTY DISCHARGE WATER TREATMENT PLANT (PDWTP)

Climax Molybdenum
A Freeport-McMoRan Company

CLIMAX MOLYBDENUM COMPANY

Climax Mine
Highway 91 – Freemont Pass
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Submitted to:

COLORADO DIVISION OF RECLAMATION, MINING & SAFETY

1313 Sherman Street, Room 215
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1.0 INTRODUCTION

The Climax Mine, located on the Continental Divide 12 miles northeast of Leadville Colorado, is a molybdenum mine owned and operated by the Climax Molybdenum Company (Climax). Climax is a wholly-owned subsidiary of Freeport-McMoRan Copper & Gold Inc. (Freeport-McMoRan), a leading international mining company with headquarters in Phoenix, Arizona, the world's largest publicly traded copper company, and one of the principal North American-based mining companies, with long-lived, geographically diverse assets and significant reserves of copper, gold, and molybdenum. The Climax Mine land holdings consist of 14,300 contiguous acres of owned patented mining claims, fee-simple land, and land acquired through exchanges with the United States Forest Service (USFS). The Climax Mine property extends into Eagle, Lake, Park and Summit Counties. Climax is one of the world's largest primary producers of molybdenum.

Operations at the Climax Mine began in 1917 and the existing permit, Mining and Reclamation Permit M-1977-493 as amended, was initially approved by the Colorado Mined Land Reclamation Board (Board) in 1977 after passage of the Colorado Mined Land Reclamation Act (CMLRA). The existing permit remains in effect for the life of the mine as set forth in CMLRA §§34-32-103(6), 34-32-109 and 34-32-116(7)(q). The permit was amended in 1980 (AM-01), 1989 (AM-02), 1997 (AM-03), 2001 (AM-04), 2006 (AM-05), and 2011 (AM-06). In addition, eighteen previous Technical Revisions (TR) to the Permit have been approved by the Colorado Division of Reclamation, Mining, and Safety (DRMS).

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As described in the current Environmental Protection Plan (EPP), submitted and approved as TR-18, the Property Discharge Water Treatment Plant (PDWTP) will be an Environmental Protection Facility (EPF). This TR submittal is intended to provide information regarding the design of the plant to satisfy the requirements of Rule 7.3 and to obtain Division approval to initiate construction of the facility.

The PDWTP is being constructed to provide second stage metals removal in preparation for the implementation of Phase II of the Climax tailing and water management system when tailing will be deposited on the Mayflower TSF. Engineering and design of the PDWTP is currently underway and is expected to be complete by summer, 2012. The design has been advanced to a point to allow detailed design of all plant elements to proceed, and as such, the information being provided with this TR represent General Arrangement drawings issued for detailed design and sufficient to allow the Division's review under Rule 7.3. Climax expects to have all permitting for the project completed by May, 2012, and construction would begin immediately upon receipt of all permits. The PDWTP is expected to be functional by spring 2014, with water treatment operations beginning during the summer of 2014.

2.0 PROJECT DESCRIPTION

Due to the Climax Mine location and elevation, there is a positive water balance consisting of snow melt and mine drainage. The focus of activity at the site since operations were substantively curtailed in the mid-1980s has been on water treatment and water management. During this period, Climax has utilized the Mayflower Tailing Storage Facility (TSF) in its treatment process for second stage metals removal prior to discharging the excess water to Tenmile Creek. To maintain and improve water quality as mining and tailing deposition progress, the existing system will be supplemented by construction and operation of the PDWTP. Within several years after the resumption of mining activities, Climax will exhaust the existing tailing storage capacity in the Tenmile TSF (Phase I tailing deposition) and will begin using the Mayflower TSF for Phase II tailing deposition. This means that Climax will no longer be able to use the Mayflower TSF for second stage metals removal. Therefore, the construction of the PDWTP, which will require two years for construction, must be completed and operational to coincide with the deposition of tailing in the Mayflower TSF; anticipated to begin in 2014.

Climax is authorized to discharge treated water into Tenmile Creek, a tributary of the Blue River, under an existing Colorado Discharge Permit System (CDPS) Permit (Permit No. CO-0000248). In addition to treated water, intercepted storm water collected above mine facilities using a series of interceptor systems is also discharged through the permitted outfall (Outfall 001). The permitted outfall is designated as the source, or beginning point, of the mainstem of Tenmile Creek. As with the current water treatment/management scheme, water from the PDWTP will be discharged above this permitted outfall to Tenmile Creek.

The current Climax water treatment system, which includes the existing Sludge Densification Plant (SDP) treats surface and underground water collected within three drainage basins; the Arkansas River Basin, the Eagle River Basin, and the Tenmile Creek Basin. The sources include mine water from the open pit and former underground workings, collected runoff and seepage from the TSFs and Overburden Storage Facilities (OSFs), and storm water runoff.

The water management system also includes an extensive system designed to recycle and reuse water in the milling process. Water is reclaimed from the ponds on the TSFs and directed to Robinson Lake, located below 1 Dam, and pumped to a process water storage tank in the Mill Area for reuse.

The tailing and water management plan will be implemented in a phased approach, as described below:

- Phase I is defined as the period when tailing are deposited in the Tenmile TSF (3 Dam). Preliminary analysis indicates that approximately 26 million additional tons of tailing could be deposited in the Tenmile TSF. As is the case under the current water treatment scheme, excess

water will be treated in the SDP and the Tenmile TSF water pool (Stage 1 treatment) and in the Mayflower TSF water pool (stage 2 treatment) and discharged from the property.

- Phase II is defined as the period when tailing are deposited in the Mayflower TSF (5 Dam). This phase will continue for many years into the future. When deposition takes place in the Mayflower TSF, Climax has determined that a new Stage 2 treatment plant (the PDWTP), will need to be operational below the Mayflower TSF to replace the treatment currently provided by the Mayflower TSF.

The construction of the PDWTP is the subject of this permit application. Experience gained through years of successful water management and treatment, coupled with bench and pilot scale testing have confirmed that all CDPS permit limits and flows will continue to be met with the new treatment plant.

Key project elements are summarized below, and additional detail is provided in subsequent sections of this application:

- The PDWTP will be located below 5 Dam on the west side of the valley and the former Highway 91;
- Plant capacity is rated at 14,000 gpm net discharge to handle spring runoff;
- The plant is designed as a High Density Sludge (HDS) process and includes filtration following primary solids removal via thickeners;
- Chemicals used currently on site for water treatment will be used for the PDWTP (no new chemicals);
- The plant will be constructed with secondary containment such that all spills will be collected within the plant and either recycled to the head of the plant or to the Mayflower TSF;
- The process building will be of similar construction as the SDP but will be larger due to the higher throughput capacity;
- The main building will house the HDS processes and will be approximately 105 feet wide and 180 feet long;
- There will be two 140 foot diameter thickeners south of the main building and effluent from these thickeners will be routed to the filter building that is approximately 90 feet wide by 280 feet long;
- Final treated water will flow by gravity from the filter building to the natural channel approximately 600 feet above the Property Line Flume (Outfall 001);
- Feed water to the PDWTP will be supplied by a barge pump station located on Mayflower Pond, which will be equipped with 3 operating pumps and one spare. The pipeline from the barge in Mayflower to the PDWTP feed tank will be approximately 19,000 feet long;
- The plant will have an "Events Pond" sized at approximately five million gallons which can temporarily collect any off spec water. The Events Pond will serve as tertiary containment and in

the event of process water reaching the Events Pond, this water will be quickly recycled back to the head of the plant through a return pipeline;

- The plant will be highly automated with automatic shutdown capabilities in the event of system failures and power outages, and will have provision to divert and reprocess water that is off specification;
- Emergency generators will be installed that will keep key process equipment operating during power outages; and
- The general site layout and site development activities have been designed to accommodate future plant expansion to the north, should the need arise.

For the purposes of maintaining and improving water quality consistent with the requirements of the Climax CDPS permit, Climax has determined that the existing water treatment and management system must be upgraded to incorporate a new water treatment facility, in preparation for the loss of existing water treatment capacity during the Phase II depositional period in the Mayflower TSF. Operation of the PDWTP represents a shift in treatment from the Mayflower pond to an external plant (PDWTP) and does not represent a significant change in technology of treatment, or a change in discharge location as compared to the current management and treatment system, but the new plant is expected to treat water more efficiently.

The main objective for the PDWTP is to achieve and maintain compliance with the effluent limitations under the existing CDPS permit. The operation of this facility will maintain the improved water quality in Tenmile Creek and ensure long-term protection of the natural environment below the Climax Mine.

2.1 Plant Capacity

As discussed above, the PDWTP is required to provide second-stage treatment of impacted water prior to discharge to Tenmile Creek. The flow capacity of the PDWTP will limit the total discharge capacity of the process water system. This will require the management and operation of water storage facilities at the site to regulate treatment plant inflows. The main detention storage capacity during spring runoff will continue to be the water pools on the Mayflower, Tenmile, and Robinson TSFs, with some additional storage provided by Robinson Lake. The additional crest raises on Tenmile TSF during Phase I Deposition will increase the operational water storage capacity of that facility and the Mayflower TSF water pool will increase as tailing is deposited in this facility.

The hydrograph at the Climax Mine site varies depending on the climatic condition each year. On average, the area receives 25 inches of precipitation per year, 75 percent of which is deposited as snow fall. Significant snow pack results in dramatic increases in surface water runoff from April through June. Accordingly, the required treatment flow rate of the PDWTP will vary seasonally.

As a task related to start-up planning, Climax has examined the treatment plant capacity requirements for different return periods to accommodate peak flows. This examination indicates the new treatment plant will require a maximum capacity of 14,000 gallons per minute (gpm).

The system flow rates utilized as the design basis are presented in Table 2.2-1 below. As indicated in the table, the monthly projected throughputs are based on wet year conditions and there may be times when it will not be necessary to treat water through the plant. Water rights considerations are discussed in Section 3.3, however, it should be noted that the flow rates listed below are not diversions as the water to be treated at the PDWTP has already been diverted at other Climax facilities.

Table 2.2-1 PDWTP Design Flow Rates

Design Criteria	Value (gpm)
Maximum Design Plant Flow	14,000
Average Design Plant Flow	5,433
Minimum Design Plant Flow	2,000
Design Wet Year PDWTP Projected Throughputs	
January	3,000
February	3,000
March	3,000
April	8,000
May	14,000
June	14,000
July	14,000
August	8,000
September	6,000
October	3,000
November	3,000
December	3,000

2.2 Plant Location and Site Layout

The PDWTP will be located adjacent to old Highway 91 northeast of Tucker Gulch in the northeast corner of the mine property (**Figure 1**). The general arrangement of the PDWTP, in relation to other features at the mine, is included on **Figure 2**. **Figure 3** depicts the general layout of the PDWTP. Temporary construction facilities including the planned, approximate locations of construction trailers and parking areas are also indicated on **Figure 3**, within the construction laydown area.

The main structures (Metals Removal Building and the Filter Building) will be comprised of perimeter steel columns, long-span roof trusses, and insulated metal wall panels. To maximize the buildings bridge crane coverage, there will be no full height interior columns. The perimeter building columns will be supported on concrete piers and spread footings that are interconnected with a continuous perimeter footing. To aid

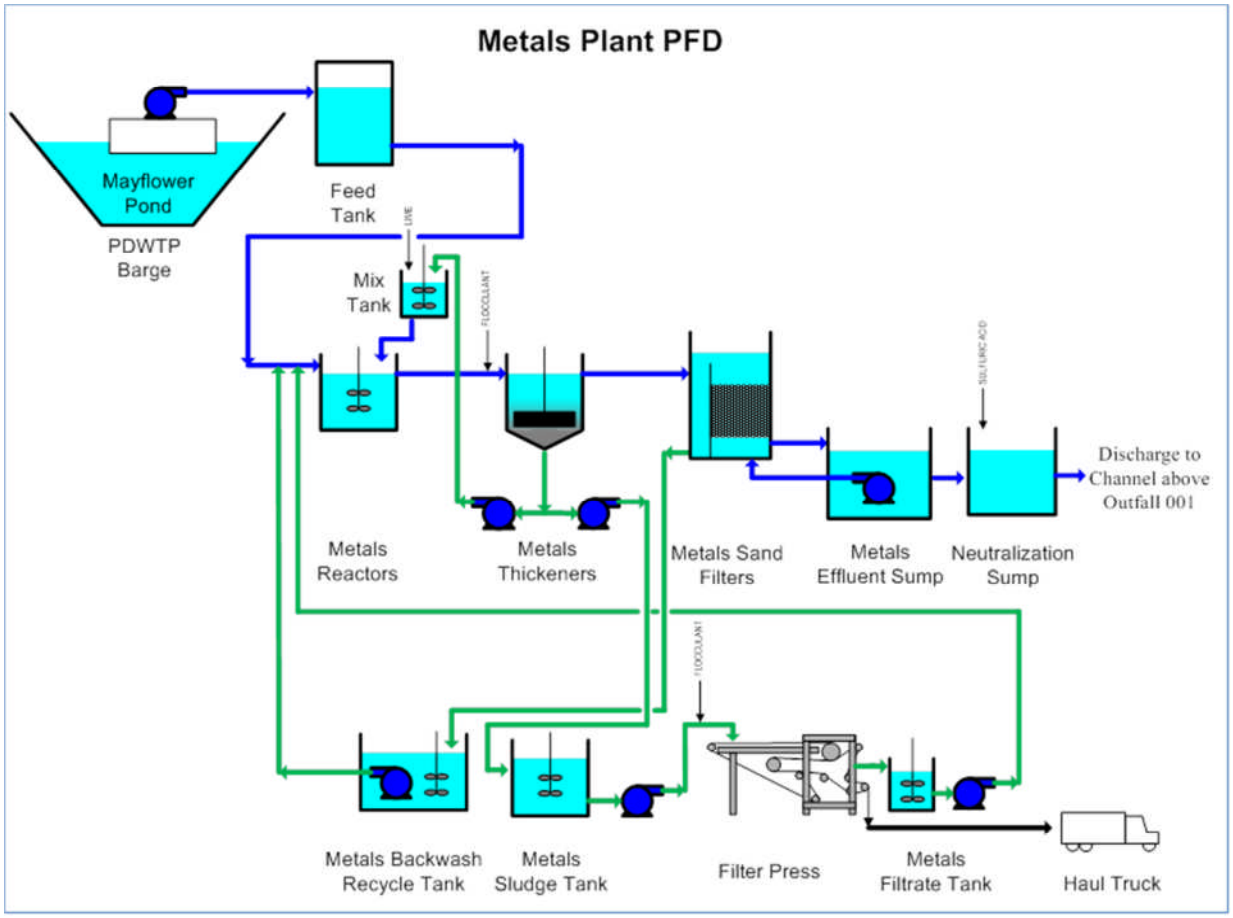
with snow removal, a concrete perimeter wall, which extends 6 feet above grade, will be provided. To minimize the safety hazard of falling snow drifts, the (insulated) roof will be detailed as flat with internal roof drains. Around the perimeter of the flat roof there will be a short parapet that will both minimize exposure to falling ice and snow and minimize the drift accumulation around the roof perimeter.

Exterior to the Metals Process Building is the vendor supplied Lime Storage and Batching Silo, located on the southeast corner of the main plant building, and two 140 foot diameter concrete thickener tanks, to the south. The large circular thickener tanks will be constructed with dome covers. The silo will be located close to the building and will be connected by an enclosed corridor. Similarly, the thickeners will be interconnected to the building by both a tunnel and a covered bridge walkway.

For safety and security purposes exterior lighting will be provided by pole mounted yard lighting and fixtures mounted on the buildings.

2.3 PDWTP Primary Treatment Processes

The primary contaminants in the water targeted for treatment are the metals, manganese, iron, copper and zinc. To meet current discharge permit limits, the concentrations of these metals must be reduced. To ensure effluent limits are met for all constituents, the plant is designed to treat flows up to 14,000 gpm. A general block flow diagram of the plant is presented below. A series of general arrangement drawings for the plant are included as **Appendix A**. These drawings, developed by CH2MHill the design engineer for the project, generally represent a 30% level of design and are 'Issued for Design' meaning they represent the basis for detailed engineering and design to proceed. Certain details depicted on the drawings, such as internal piping layouts, are subject to change as the project continues into final design, however, very little is anticipated to change relative to major equipment, overall layout, and building configurations.



PDWTP Block Flow Diagram

Feed water from the Mayflower TSF water pool will be pumped by the PDWTP Barge to the head of the plant for treatment (Figures 2 and 3). The plant will utilize the HDS process, which re-circulates sludge to maximize the neutralization potential of the added lime and improve coagulation and settling. Lime will be added to the incoming water from the Mayflower TSF in the Metals Reactor. To maximize metals removal, the plant will be operated at a pH of 10.0 s.u. The resulting precipitate will be thickened in the Metals Thickeners. The thickener overflow will be filtered in a sand filter to remove any remaining precipitate solids. Sulfuric acid will be added to provide a final pH adjustment, and the filtrate will be discharged to the natural channel above Outfall 001 in Tenmile Creek.

Water from the feed tank will go to Reactor #1 and then to Reactor #2. The piping will be arranged as to allow either reactor to be used alone. Each reactor will be provided with an agitator. Lime will not be supplied directly to the reactors, but via the Mix Tank situated above the reactors, where it will be mixed by an agitator with the returning recycled sludge. This lime coated sludge promotes HDS reactions, while the lime addition raises the pH to approximately 10 in the reactors. Air will be sparged in via a “bottle cap” type sparge system below the surface to oxidize iron and manganese. The reactor overflow will flow

to a splitter box which directs the flow to the two thickeners. Two smaller thickeners provide operational flexibility allowing one thickener to be taken offline for maintenance or when both are not needed, based on plant influent flow rates. Thickener underflow will be recycled to the Mix Tank with a slip stream sent for dewatering in a plate and frame press.

The thickeners' overflow will flow to gravity sand filters. An underdrain system will collect the filtered water. A portion of the water will be used for backwashing the sand filters and the balance will be neutralized with sulfuric acid and discharged. Each of the sand filter units will be backwashed regularly as needed. The backwash cycle consists of air scour from a blower system, followed by a water backwash plus air, then only water. The backwash waste water will be pumped back to the reactor tanks for treatment.

The main plant area will occupy a majority of the metals plant building interior, with a smaller area being designated for the occupied rooms (such as the General Purpose Room, Laboratory, Control Room, etc.). To provide good access for maintenance and operations personnel, each tank and equipment support platform will be interconnected by a series of grated walkways. The platforms for the sludge dewatering system will be elevated such that a dump truck or roll off bin can be placed below the filter press to collect dewatered sludge. Interior walls that are common to the main plant area and the enclosed spaces will be partially grouted concrete masonry unit (CMU) walls which will serve as a sound barrier and rated fire separation. Walls that are interior to the occupied rooms will be framed with metal studs. All rooms will be enclosed by a concrete slab over metal deck; these decks will also serve as a mezzanine level.

2.3.1 Solids Handling and Sludge Disposal

Solids will be removed by the thickeners. The thickeners' underflow, made up of sludge thickened to approximately 25% solids by mass, will be recycled at all times. The mass of solids in the recycle will be targeted to be at an 80:1 ratio to the mass of the solids produced from the incoming water being fed to the plant. Sludge will periodically be wasted, or pumped from the thickeners to a sludge storage tank, to await dewatering. The sludge tank is sized to hold three days' worth of maximum solids production.

A filter press will be used to dewater solids from the thickeners. The filter press will discharge onto a shuttle conveyor, which will convey dewatered sludge into roll-off type dumpster bins, or directly into a truck. The dewatered sludge will be transported to within the footprint of the Mayflower TSF for disposal. Filtrate from the press will be pumped back to the reactor tanks.

2.3.2 Process Control Strategy

The PDWTP has been designed with the level of control and redundancy needed to achieve compliance with the Climax mine CDPS permit requirements and environmental protection of Tenmile Creek. This includes extensive automatic control of systems based on installed instrumentation, while providing operators with alarms and the ability to run systems manually, if required. The PDWTP will be fully

integrated into the current site-wide SCADA and human-machine interface (HMI) monitoring and control systems via fiber optics. The control strategy is designed for automatic and controlled shutdown in the event of system failures or power outages, and will provide for automatic collection and recycle of off specification water.

2.4 Reagents

Although not classified as Designated Chemicals, water treatment chemicals or reagents are identified in the EPP. Reagents used in the process are essentially the same as those used at the existing SDP and include lime for metals precipitation, flocculant to facilitate the settling of precipitated solids, and sulfuric acid to lower the pH of the treated water to circumneutral prior to discharge. General information for these chemicals is provided in the EPP. Specific information relative to the storage and use of these chemicals at the PDWTP is provided below.

2.4.1 Unloading Stations

Reagent truck unloading facilities for the new PDWTP have been designed to provide secondary containment to capture potential spills. In addition to containment of materials, the design minimizes safety hazards and provides for efficient snow removal.

2.4.2 Lime Storage and Slaking

A new lime slaking facility will be constructed at the PDWTP to support the requirements of the plant. Calcium oxide (CaO), as pebble lime, will be fed from a silo to the main treatment building. The lime slaking system has been designed for adequate dust control and grit handling. Additionally, because the lime system may become caked with deposits, adequate redundancy has been provided using redundant lime recirculation pumps, and the slurry will be fed from a pumped loop system. The system design is similar to Climax's existing lime slaking plant, near the SDP.

Quick lime (CaO) will be delivered in bulk to the project and stored in a vertical storage silo (approximately 50 to 100 tons of dry storage capacity), similar to the existing Climax Lime Station, near the SDP. This lime will be fed into the treatment building in an enclosed screw conveyor and fed to the lime slaker where the lime will be hydrated, mixed with water to create a slurry, then fed into a lime slurry tank for transfer to the reactor tanks. Any lime slurry spill will be contained within secondary containment/sump system of the plant and returned to the plant feed or process tanks.

2.4.3 Sulfuric Acid Storage and Distribution

Sulfuric acid will be used to neutralize the treated water prior to discharge. Sulfuric acid will be trucked to the site. The acid will be unloaded into a phenolic lined carbon steel tank (approximately 4,300 gallon capacity). The acid storage area will be located in an isolated room at the north end of the filter building. The tank will be located within an epoxy coated concrete containment area, isolated from the plant-wide

sump system. The acid storage room will also be equipped with appropriate ventilation to maintain a safe working environment. The tank and truck unloading areas will have secondary containment for spills. The acid will be pumped to the neutralization circuit through either Teflon or stainless steel tubing using positive displacement reagent pumps.

2.4.4 Other Reagents

Other reagents to be provided as part of the PDWTP include a flocculant used to enhance sludge densification in the thickeners. This flocculant is similar to that used in the existing SDP plant.

2.5 Capture and Return of Diversions and Overflows

Each portion of the main treatment building has been designed with a dedicated sump to catch overflows and spills. These sumps will return the water to the head of the respective treatment trains. In the event that there is an overflow from these two sumps in the building, water will be routed to the Mayflower Return Sump. Effluent from the thickeners may also be routed to this sump to add start-up and shut-down flexibility. The Mayflower Return Sump pump station can convey up to 7,000 gpm back to the Mayflower TSF or up to 500 gpm back to the head of the PDWTP.

If the Mayflower Return Sump overflows, water will then flow by gravity to the Events Pond, which will capture overflows until such time that it can be pumped out. The concrete-lined pond will have a capacity of approximately five million gallons. The capacity is based on the intent to safely accommodate the full volume from failure of the largest single vessel (thickener) or the combined capacity of the influent line and feed tank. Pumps in the Events Pond are sized to empty the pond over a 24-hour period, and the water will be pumped back to the Mayflower Return Sump. Water in the Mayflower return sump can be pumped back to the Mayflower TSF or to the head of the circuit for treatment.

The Events Pond will be constructed at the north end of the site (**Figure 3**) to capture overflows and provide tertiary capture and containment of off-specification water and spills. The pond will be maintained empty or dry and is only intended to capture water if the capacity of secondary containment within the plant is exceeded. Water will not be stored in the pond, but will be pumped back to the plant or Mayflower TSF as soon it begins to accumulate.

2.6 Ancillary Facilities

Other infrastructure improvements required to support the PDWTP include the following:

- Mayflower Barge Pump Station (PDWTP supply)
- Pipeline Corridors and Pipelines
- Power Distribution, Fiber Optic and Gas Utilities Supply
- Potable Water and Sanitary Sewer Systems
- Roads and Access

2.6.1 Mayflower Tailings Storage Facility Barge Pump Stations

A new barge pump system will be built for the Mayflower TSF (**Figure 2**) to supply water to the new PDWTP for treatment. The PDWTP Barge will convey approximately 14,000 gpm to the PDWTP. The system is anticipated to consist of three duty pumps and one standby pump.

The existing access road (the West Interceptor Road) to the barge sets will be improved, including upgrading the alignment, widening the road surface, and providing safety berms to meet the design criteria. In addition, a widened area for vehicular parking will be provided next to the shore anchors and bridge landings for the barge systems. The access roads will be surfaced with gravel.

A critical design parameter for the barge system is the possible water level fluctuation of up to 30 feet over the course of a year. The pond elevation is expected to increase up to approximately 210 feet, based on the current mine plan and the barge location will be moved, as indicated by the multiple locations illustrated on **Figure 2**.

The final design for this pump system has not yet been finalized. However, the floating barge will be an enclosed structure, with metal siding over a steel structure with a peaked roof. A picture of a similar sized barge is provided in Appendix B. The PDWTP Barge is anticipated to be on the order of 35 to 40-feet wide by 60 to 80-feet long. Building color will be selected to match the treatment plant locations, although the location of the barge system will be difficult to see from Highway 91.

2.6.2 Pipeline Corridors and Pipelines

Where possible, the new pipelines will be routed along existing roads, with improved alignment, width, and safety berms to meet the design criteria, as discussed above. The pipelines will generally be located within existing roads, and the roads will be surfaced with gravel, as necessary. To improve pipeline maintenance, access tees and/or manholes will be provided at regular intervals along the pipeline. The road and pipeline alignments will be coordinated and finalized during the next design phase, but preliminary locations are shown on **Figure 2**.

The feed water pipeline will be routed from the barge to the West Interceptor Road and along the west side of the Mayflower TSF to the feed tank at the PDWTP. New sections of 36-inch diameter pipe will connect to the existing 42-inch diameter mill water return pipeline to deliver water to the plant, with a design capacity of 14,000 gpm. The Mayflower Sump return line is 24-inch diameter and is designed to convey 7,000 gpm from the PDWTP to the Mayflower TSF. This return line will be routed up the old Highway 91 road alignment to the south and around the east side of the Mayflower TSF, joining the existing alignment and access road for the existing tailing distribution line (TDL).

2.6.3 Fresh Water and Sanitary Sewer

Water for non-potable PDWTP industrial uses only (including wash down as well as process water) will be supplied by a new supply well, to be constructed in the alluvial aquifer. The general location of this industrial supply well is indicated on **Figures 2** and **3**. The exact location may vary, depending on site access and hydrogeologic conditions.

Potable water demand for the facility will be on the order of 1 gallon per minute on average. A bedrock well and a natural spring, both located along the West Interceptor Road are being evaluated for potable water. The spring identified for possible use is located approximately 9,500 feet southwest of the PDWTP, to the west of the Mayflower TSF, and the area being considered for the well is just south of Tucker Gulch along the West Interceptor Road. Both locations are identified on Figure 2; however, the well location is approximate and may vary depending on hydrogeologic conditions.

Sanitary water will be directed to a septic tank and leach field, the location of which will be determined during the next design phase. A preliminary leach field location is identified on Figure 3, however this location is subject to change based on additional site investigation activities. Laboratory wastewater streams will be returned to the head of the process and will not be discharged to the septic system.

2.6.4 Power and Utilities

Power to the PDWTP will be provided via a substation shown on **Figure 2** (the Climax 115 kV Substation), which is expected to be upgraded by Xcel or Climax as part of the project. From the substation two existing 25-kV distribution lines, which are partially buried, will carry the power to points of use within the project area. The main plant 25-kV x 4.16-kV transformer will be rated at 3.75-MW, and the main plant 4160 volt (V) x 480-V transformer will be rated at 3.75-MW. Both have been sized to accommodate the currently anticipated loads and potential future expansion. In-stock spare medium voltage (MV) and low voltage (LV) transformers will be supplied, reducing downtime in the event of a transformer failure. A site-rated 750-kW, diesel-driven, arctic-duty enclosed, U.S. Environmental Protection Agency (EPA) Tier II generator will be provided to supply critical emergency power to the plant during periods of power loss. Critical process equipment and building lighting, heating, ventilation, and communications systems can be maintained during a power loss. A fiber-optic cable will provide voice and data communications within the plant, and a dual-control fiber-optic link will interconnect all process areas of the plant to the plant PLC and SCADA network of the main mill site. This fiber-optic link will provide for monitoring and remote control of the plant. Telephone connection to the plant will be provided, along with a plant access control network. A cell-phone repeater and a very high frequency (VHF) radio repeater site near the plant are being evaluated.

Natural gas will be provided to the PDWTP site by tying into the existing Xcel gas line supplying the existing Property Line Flume building. A 2-inch line will be routed around the site to supply all buildings for heating purposes.

2.7 Roads and Access

The PDWTP will be located at the northern edge of the property along an existing paved access road. The main access to the plant will be provided from the existing site entrance off SH 91 (at its intersection with the old alignment). The existing asphalt-paved roadway will be improved by milling the surface and overlaying with new asphalt. The existing security gate along the old highway alignment will be upgraded as necessary to control access to the plant. Access will also be provided from the south by the West Interceptor road (gravel), portions of the old highway alignment (paved) and gravel site roads. These roads will be improved along the portions where pipelines will be constructed.

2.8 Project Schedule

Engineering and design of the PDWTP is currently underway and is expected to be complete by summer, 2012. Climax expects to have all permitting for the project completed by May, 2012, and construction would begin immediately upon receipt of all permits. The PDWTP is expected to be functional by spring 2014 and operational by summer 2014.

2.9 Construction Quality Control/Quality Assurance

The project is being executed under a modified Engineering, Procurement, Construction Management (EPCM) model, with the project divided into distinct work packages, which will each have detailed construction drawing and technical specification packages. As discussed previously, CH2MHill is the EPCM Contractor for the project and will act as design engineer as well as serving as the Construction Manager with overall project oversight provided by Climax and third party contractors. The technical specifications will contain equipment and material specifications, project execution requirements, and quality control requirements, which will be the responsibility of the Climax, CH2MHill, and the General Contractor. CH2MHill will employ third party contractors to provide specific material testing and inspection services to demonstrate compliance with the project specifications. Quality assurance, consisting of ensuring the completion of all quality control activities, review and approval of quality control results, and independent inspections and testing, will fall under the responsibilities of CH2MHill as the Construction Manager, who will have overall responsibility for ensuring the facilities are constructed in accordance with the plans and specifications.

3.0 OTHER AGENCY PERMITS AND AUTHORIZATIONS

The PDWTP is located within the "affected land" boundary as classified under Climax's existing Mine Reclamation Permit (Permit # M-77-493), issued by the Colorado Division of Reclamation, Mining and Safety (DRMS). The PDWTP is identified as an Environmental Protection Facility (EPF) under the Site's Environmental Protection Plan (EPP), the most recent update of which was submitted and approved as TR-18.

3.1 Permits Required for the PDWTP

The federal, state, and local permits and approvals that will be required from agencies other than the DRMS specifically for the PDWTP are described below.

U.S. Army Corps of Engineers Section 404 Permitting

The U.S. Army Corps of Engineers (Corps) defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions". Jurisdictional wetlands are subject to Section 404 of the Clean Water Act and are defined using soils, vegetation, and hydrologic characteristics. Areas displaying hydric soils with hydrophytic vegetation that are saturated or inundated for a defined portion of the growing season and are not isolated from navigable waters of the U.S. are considered jurisdictional wetlands. Section 404 establishes requirements for dredge and fill activities within waters of the U.S., including wetlands.

Climax has applied for a permit with the Corps to meet Section 404 permitting requirements for the PDWTP. Based on the proposed plan, and consultation with the Corps, Climax is seeking authorization under the Nationwide Permit Program (NWP). A Pre-Construction Notification (PCN) was submitted to the Corps on November 30, 2011, and a copy is included in Appendix C. The mitigation plan included in this application is the same mitigation plan submitted to the Corps in the PCN. Wetland impacts and permitting requirements are described in greater detail in Section 4.

Air Permit for Lime Slaking and Emergency Generators

Climax holds an active Air Permit (#04LK0877) issued by the Air Pollution Control Division (APCD) of the Colorado Department of Public Health and Environment (CDPHE). The initial approval for this air permit was issued in 2005. Modification 1 to the air permit was issued in 2008 and Modification 2 was issued in 2011, both in association with modifications to the site for the resumption of mining and milling operations.

The lime silo and emergency generators to be located at the PDWTP represent the only identified sources associated with this project that may have regulated air emissions. The lime silo for the PDWTP plant was identified in the 2008 permit modification and therefore is covered under the existing permit. As

detailed specifications for the emergency generators are developed, permitting requirements will be determined and a modification request will be submitted to the APCD, if necessary. Dust control measures during construction will be employed to minimize the generation of dust and maintain compliance with the opacity limits in the air permit. Air quality is described in greater detail in Section 10.1.

Summit County Activity of State Interest

The PDWTP falls under the classification of Major New Water and Sewage Treatment System as a designated activity of State interest under the Summit County Land Use and Development Code, and Climax is in the process of obtaining what is known as a 1041 permit through the County Planning Department.

Summit County Building Permits and Grading, Excavation and Access Permits

Building permit applications will be submitted to the Summit County Building Department for each individual structure associated with the PDWTP. The building permit applications will include a site plan, floor plans, exterior elevations, foundation and framing plans, and all other required civil/structural materials. Technical permit applications for electrical, plumbing, and mechanical will also be submitted to the Building Department for each individual facility. The grading, excavation, and access permit application will be submitted to Summit County prior to the building permit applications.

Summit County Septic Permit

An application for an onsite wastewater system permit (or individual sewage disposal system (ISDS) permit) will be submitted to the Summit County Environmental Health Department for the PDWTP prior to construction of the system. The application will include a site plan showing the locations of the proposed buildings, septic tank, leach field, surface waters, wetlands, and the slope of the proposed leach field.

Potable Water Treatment System

The Climax Mine currently operates potable water treatment systems under PWSID #C00233300. It is anticipated that a small, modular, membrane treatment system, similar to the system used at the SDP, will be used to provide potable water to the plant. An Application for Construction Approval system will be submitted, as necessary, to CDPHE once the treatment system is selected.

Construction Storm Water Permit

The EPA requires that storm water discharges be regulated under the National Pollutant Discharge Elimination System (NPDES) program. The Colorado program is referred to as the Colorado Discharge Permit System (CDPS), and is administered by the Water Quality Control Division (WQCD) of CDPHE.

Climax will submit a general permit application for Storm Water Discharges Associated with Construction Activities (Storm Water Construction Permit) at least 10 days prior to the start of construction activities. A

Storm Water Management Plan (SWMP) will be prepared prior to the submittal of the storm water permit application and will include BMPs.

Construction Dewatering

In accordance with the provisions of the Colorado Water Quality Act and the Clean Water Act, an application will be submitted to the WQCD of CDPHE for construction dewatering at least 30 days prior to the anticipated date of discharge. The permit will allow construction discharge from an approved location to Tenmile Creek, in accordance with effluent limitations, monitoring requirements, and other conditions to be set forth in the permit.

4.0 COMPENSATORY WETLAND MITIGATION AND FINANCIAL ASSURANCE

Jurisdictional wetlands are subject to Section 404 of the Clean Water Act and are defined using soils, vegetation, and hydrologic characteristics. Areas displaying hydric soils with hydrophytic vegetation that are saturated or inundated for a defined portion of the growing season and are not isolated from navigable waters of the U.S. are considered jurisdictional wetlands. Section 404 establishes requirements for dredge and fill activities within waters of the U.S., including wetlands. The construction of the PDWTP will result in unavoidable adverse impacts to wetland areas identified on the site and Climax is working with the Army Corps of Engineers (Corps) to pursue a permit to authorize construction and complete compensatory wetland mitigation to offset the impact.

4.1 Wetland Delineation Results

Wetlands were delineated on the PDWTP site by Bikis Water Consultants, LLC (BWC) based on the latest delineation manual of the Corps. As shown in **Figure 4**, three wetlands occur on the project site for a total of 1.907 acres. The wetland delineation was approved by the Corps in a letter dated October 11, 2011.

4.2 Wetland Disturbance

Following an evaluation of alternative site layouts and avoidance measures, the final site location and layout was selected. **Figure 5** includes the proposed site plan and alteration of wetlands on the PDWTP site. The project is proposed to impact an estimated 0.37 acre of wetlands, which includes 0.262 acre of permanent impacts and 0.104 acre of temporary impacts. The temporary impacts will occur from construction access and will be restored following construction. Impacts will occur from: 1) fill and grading needed to construct the treatment plant, 2) construction of an interceptor ditch necessary to divert surface water run-on around the site and, 3) construction of the outfall to Tenmile Creek. The impacts are unavoidable to enable use of the property for the treatment plant, and mitigation plans have been developed to offset these impacts.

Climax has applied for a permit with the Corps to meet Section 404 permitting requirements for the PDWTP. Based on the proposed plan, and consultation with the Corps, Climax is seeking authorization under the Nationwide Permit Program (NWP). A Pre-Construction Notification (PCN) was submitted to the Corps on November 30, 2011.

4.3 Compensatory Wetland Mitigation

To offset unavoidable adverse impacts to the wetlands a compensatory mitigation plan was developed and submitted to the Corps. A copy of the mitigation plan is included as **Appendix B** for reference.

Climax will fully comply with the Section 404 permit program and all terms and conditions of the 404 permit received for the project. Disturbance to wetlands will be mitigated as generally described below.

4.3.1 Wetland Creation

An additional 0.46 acre of wetlands will be created on-site near the relatively narrow portion of the existing Wetland 3. The location of the mitigation is shown on **Figure 6**. Wetland 3 is a relatively large and diverse wetland whose value would be increased by increasing its size. Measures will be included in the site design to maintain the surface water supply for this wetland, and discharging groundwater from foundation drains to the wetland. **Figure 7** is a conceptual-level plan of the proposed mitigation and

The wetland creation will result in the expansion of Wetland 3. The wetland will be created as follows:

- The creation area will be excavated to the same elevation as the adjacent wetland. Excavated material will be used for fill on site, or disposed of at an off-site, upland disposal area. Excavated wetland topsoil from the disturbed wetland area will be placed as fill in the mitigation area.
- Final grading will be completed.
- The wetland will be planted with the herbaceous wetland species listed on **Figure 7**. Plantings will be placed 2-foot, on center.
- The trees and shrubs listed on **Figure 7** (primarily willows and alders) will be planted around the periphery of the created wetland.
- The created wetland will be monitored for a period of at least five years, or until the success criteria for the area have been met. Monitoring will include measurements of the vegetation community along with photographs.
- The transition area next to the wetland (the cut slope and any disturbed areas) will be seeded and mulched with the seed mix identified on **Figure 7**.
- Corrective actions will be implemented, as needed, to remedy any deficiencies with the site. Corrective actions include: re-planting, weed control, additional seeding, alteration of site work to improve water flow and other measures.
- The mitigation site will be monitored until deemed successful by the Corps. However, the site will be maintained by Climax.

4.3.2 Performance Standards

In accordance with the Mitigation Plan submitted to the Corps, the mitigation will be deemed successful when the following criteria are met at the site:

- Percent cover of wetland species of at least 80 percent. Wetland species will be determined using the “National List of Plant Species that Occur in Wetlands: Intermountain (Region 8)”
- At least two dominant species;

- At least 60 percent survival of planted trees and shrubs, with a canopy cover of at least 30 percent.

4.4 Financial Assurance

In accordance with 33 CFR Part 332.3(n), the Corps is requesting financial assurance to ensure a high level of confidence that the compensatory mitigation will be successfully completed, in accordance with the performance standards (success criteria) described in the mitigation plan. The financial assurance regulations allow the Corps to determine that financial assurances are not necessary in cases where an alternate mechanism is available to ensure a high level of confidence that compensatory mitigation will be provided and maintained. In this case, the Corps has agreed to consider the existing reclamation bond held by the DRMS to provide the necessary assurance, subject to the approval of this TR by the Division.

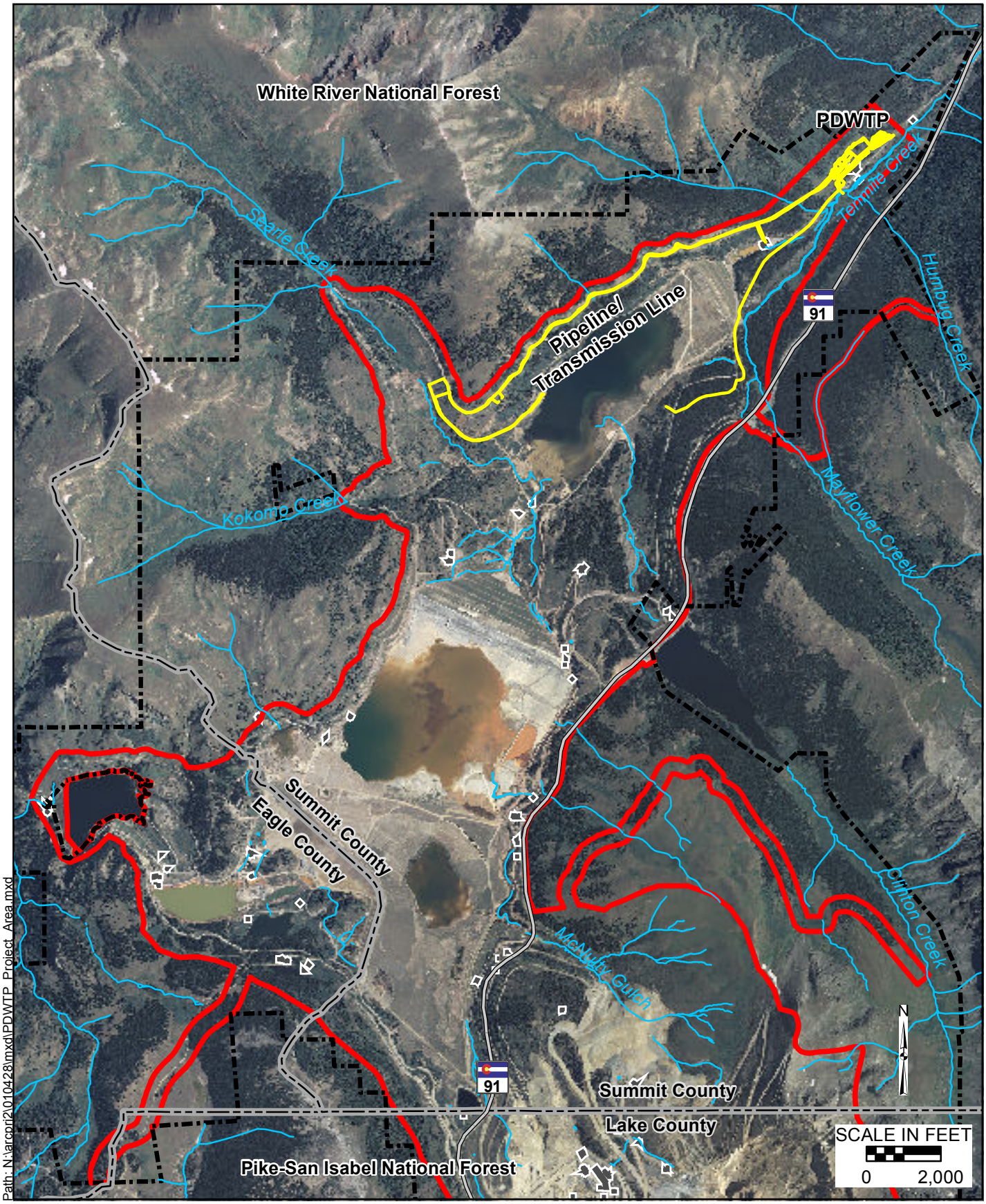
Under the current financial assurance required and held by the DRMS, Climax maintains a surety bond in the amount of $78,246,088. Of this amount $2,481,035 is allocated for revegetation and reseeding associated with reclamation of the site. The wetland mitigation project is scheduled to be completed during 2012, with the creation, or construction of the wetland mitigation concurrent with the disturbance to wetlands created by the plant construction. The estimated cost associated with the creation of the additional 0.46 acre under the mitigation project is estimated to be approximately $30,000, as follows:

- Excavation and grading of the mitigation area $5,000
- Placement of wetland soils and planting $15,000
- Planning, engineering, oversight and monitoring $10,000

Climax will complete the mitigation under the terms of the 404 NWP, and is requesting that DRMS include this work under the existing reclamation bond. The required site-wide reclamation effort, covered under the existing bond, includes all reclamation associated with anticipated site disturbance and ensures revegetation success prior to bond release. Climax completed 105.5 acres of reclamation in 2011, although approximately 25 acres were only partially reclaimed with final reclamation planned for 2012. The 80 acres of final reclamation completed in 2011 will more than offset the 0.46 acres of additional wetland mitigation such that an increase in the performance bond will be unnecessary. Details of 2011 reclamation work are included in the 2011 Annual Reclamation Report to DRMS.

Monitoring of the mitigation site will be performed for a period of five years, or until the success criteria are met, and annual mitigation monitoring reports will be provided to the Corps. It is anticipated that the performance standards will be met in a period of two to three years following construction and at no time during that time frame would the current bond amount be considered insufficient to cover the reclamation costs of current disturbances, including the wetland mitigation. Climax will notify both the Corps and the DRMS when mitigation site monitoring indicates that the performance standards are met.

FIGURES



Legend

- highways
- Perennial and Intermitent Streams
- County Boundary
- Property Boundary
- PDWTP Outline, Pipeline, and Transmission Line
- Affected Land Boundary
- Buildings

October 2011

Figure 1

PDWTP
Project Area

Climax Molybdenum

MILL WATER SUPPLY PIPELINE
SUPPLY CANAL NO. 2
EXISTING 42" MILL WATER RETURN LINE
VALVE VAULT
SPRING LOCATION
PDWTP INFLUENT PIPELINE FROM MAYFLOWER BARGE
HEAD TANK
BARGE SUBSTATION
VENT VAULT
CLIMAX PROPERTY BOUNDARY
KOKOMO CREEK
WEST INTERCEPTOR
PDWTP FEED LINE FROM BARGES
TUCKER CREEK
MAYFLOWER DECANT
5 DAM SEEPWATER PUMP STATION
BARGE SET 4 MAX. WSEL 10730
BARGE SET 1 MAX. WSEL 10640
BARGE SET 3 MAX. WSEL 10700
BARGE SET 2 MAX. WSEL 10670
2010 WATER LEVEL
MAYFLOWER POND
POTENTIAL DOMESTIC WATER WELL (APPROX.)
PROPERTY DISCHARGE WATER TREATMENT PLANT SITE
PIPELINE TERMINAL
OLD HIGHWAY 91
NORTH PORTAL TENMILE TUNNEL
MAYFLOWER RETURN PIPELINE
UPPER OPERATING LIMIT AT 180 MT
ORIG. ULTIMATE DAM CREST ELEV. 10,950
DAM CREST AT 180 MT. ELEV. 10,820
2010 DAM CREST, ELEV. 10,610
5 DAM
POWER LINES (EXISTING)
EFFLUENT PIPELINE OR CHANNELFROM PDWTP TO TENMILE CREEK
EVENTS POND
CLIMAX 115kV SUBSTATION
EXCEL 115kV SUBSTATION (EXISTING)
MAYFLOWER CANAL
PROPERTY LINE FLUME
EXISTING MAYFLOWER SEEPAGE PUMPBACK PIPELINE
INDUSTRIAL WATER WELL (APPROX.)
3 DAM
EXISTING POND SHOP
CLINTON GULCH
PDWTP EFFLUENT DISCHARGE TO MAYFLOWER DECANT
CLINTON CANAL
EXISTING LIME SLURRY LINE TO 3 DAM PUMP STATION
METALS SLUDGE CELL AREA
SUPPLY CANAL NO. 1
MAYFLOWER CREEK
CLIMAX PROPERTY BOUNDARY
HIGHWAY 91
CLINTON RESERVOIR

0 500 1000 1500 FT

Figure 2
Overall Site Facilities Plan

MARK	DESCRIPTION	DATE	BY	CHK.
D	RELOCATED HEAD TANK, ADDED115kV SUB'N, RELOCATED INDUSTRIAL WATER WELL, LOCATED SPRING WATER.	31JAN12	ABE	
C	GENERAL REVISION, ISSUED FOR DESIGN	5DEC11	ABE	
B	ISSUED FOR ESTIMATE	25AUG11	ABE	NONE
A	ISSUED FOR REVIEW AND APPROVAL	20JUL11	ABE	NONE

REVISIONS

NUMBER	TITLE

REFERENCE DRAWINGS

Climax Molybdenum
A Freeport-McMoRan Company
CLIMAX, COLORADO

CH2MHILL
MINING AND MINERALS
GREENWOOD VILLAGE, COLORADO

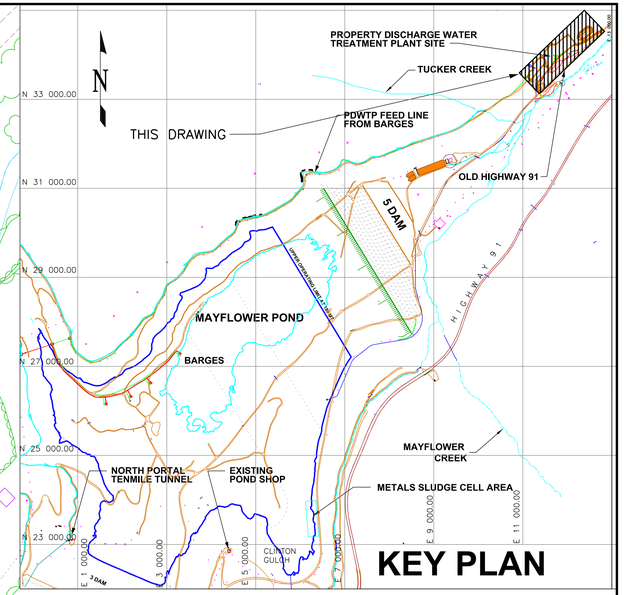
CLIMAX MINE
PDWTP PROJECT
GENERALL ARRANGEMENT – OVERALL SITE FACILITIES PLAN

DESIGNED BY: DATE: A. EDMONSTONE	APPROVED BY: DATE: 0-0-00
DRAWN BY: DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: DATE: 0-0-00	DWG. SCALE: 1"=600'-0"
CHARGE: 421904	
DRAWING NO. 810-G-001	REV. D

PLANT NORTH
40°

E 11 000.00
E 12 000.00
E 13 000.00
N 34 000.00
N 33 000.00
E 11 413.396

INTERCEPTOR DITCHES
EVENTS POND CREST ELEV. 10327'-0"
INDUSTRIAL RAW WATER WELL (APPROX.)
TEMPORARY CONSTRUCTION TRAILERS AND PARKING
SEPTIC FIELD
CONSTRUCTION LAYDOWN AREA
TRANSFORMERS
PARKING
NORTH SERVICE ROAD
PLANT OVERFLOW PIPELINE
EVENTS POND PUMPHOUSE
METALS REMOVAL BUILDING
TENMILE CREEK
W.E. 10283.5
FEED WATER TANK
THICKENER #2
THICKENER #1
179'-11"
160'-0"
118'-6"
180'-0"
105'-0"
115'-4"
N 33 848.000
ELEV. 10379'-0" NOM.
ELEV. 10380'-0" NOM.
PIPELINE TERMINAL BUILDING
FILTER BUILDING
156'-6"
288'-0"
ELEV. 10361'-0" NOM.
ELEV. 10352'-0" NOM.
8'-9"
FEED TANK
123'-0"
THICKENERS
88'-0"
STORMWATER POND
POWER POLES (EXISTING)
PROPERTY LINE FLUME ELEV. 10300 (EXISTING)
PDWTP DISCHARGE INV. ELEV. 10333
HIGHWAY 91
10750 10700 10650 10600 10550 10500 10450 10400 10350 10300 10275 10325



KEY PLAN

LEGEND:
- ROADS (EXISTING)
- VEGETATION
- STREAM AND PONDS
- ROADS (NEW)
- FACILITIES (NEW)
- BWC WETLAND JURISDICTIONAL
- BWC WETLAND NON-JURISDICTIONAL
- WETLAND MITIGATION AREA

0 100 200 300 FT
100 50

Figure 3
PDWTP Site Plan

MARK	DESCRIPTION	DATE	BY	CHK.
	REVISIONS			

MARK	DESCRIPTION	DATE	BY	CHK.
H	ADDED WETLAND MITIGATION AREA, CONSTRUCTION TRAILERS AND INDUSTRIAL WATER WELL.	01FEB12	ABE	
G	GENERAL REVISION, ISSUED FOR DESIGN	03DEC11	ABE	
F	UPDATED WETLAND OUTLINES	03OCT11	ABE	NONE
	REVISIONS			

MARK	DESCRIPTION	DATE	BY	CHK.
E	RELOCATED FEED TANK PER ESTIMATE, ISSUED FOR ESTIMATE	25AUG11	ABE	NONE
D	DWG NO. WAS 810-P-GA-002, REVISED PER CLIENT COMMENTS, ISSUED FOR ESTIMATE.	05AUG11	ABE	NONE
C	REVISED PER CLIENT COMMENTS, ISSUED FOR ESTIMATE	14JUL11	ABE	NONE
B	NON JURISDICTIONAL & HABITANT MGNT WETLAND REMOVED	21JUN11	ABE	NONE
A	ISSUED FOR REVIEW AND COMMENT	19JUN11	ABE	NONE
	REVISIONS			

NUMBER	TITLE
	REFERENCE DRAWINGS

Climax Molybdenum — A Freeport-McMoRan Company — CLIMAX, COLORADO
CH2MHILL — MINING AND MINERALS GREENWOOD VILLAGE, COLORADO

CLIMAX MINE
PDWTP PROJECT
PROPERTY DISCHARGE WATER TREATMENT PLANT
PLOT PLAN – PROCESS PLANT FACILITIES

DESIGNED BY: DATE: A. EDMONSTONE	APPROVED BY: DATE: 0-0-00
DRAWN BY: DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: DATE: 0-0-00	DWG. SCALE: 1"=100'-0"
CHARGE: 421904	
DRAWING NO. 810-G-002	REV. H

106°9'40"W 106°9'30"W 106°9'20"W 106°9'10"W 106°9'W

39°27'10"N 39°27'N 39°26'50"N

Map Legend

- Culvert
- General path of surface water flow
- Project Area
- Wetland
- Area with wetland characteristics, but non-jurisdictional (Not adjacent or connected to a water of the U.S.)
- 25' Wetland Set-Back (Per Summit County)

Wetland 3
(1.123 acres)

No defined
channel, swale
or evidence of flow

Wetland 2
(0.097 acres)

Tenmile Creek

Historic Highway

91

Debris flow
spring 2011

Water directed
this way

Wetland 1
(0.687 acres)

Very steep bank

Continues

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www.BikisWater.com

0 150 300 600 Feet

1 inch = 300 feet

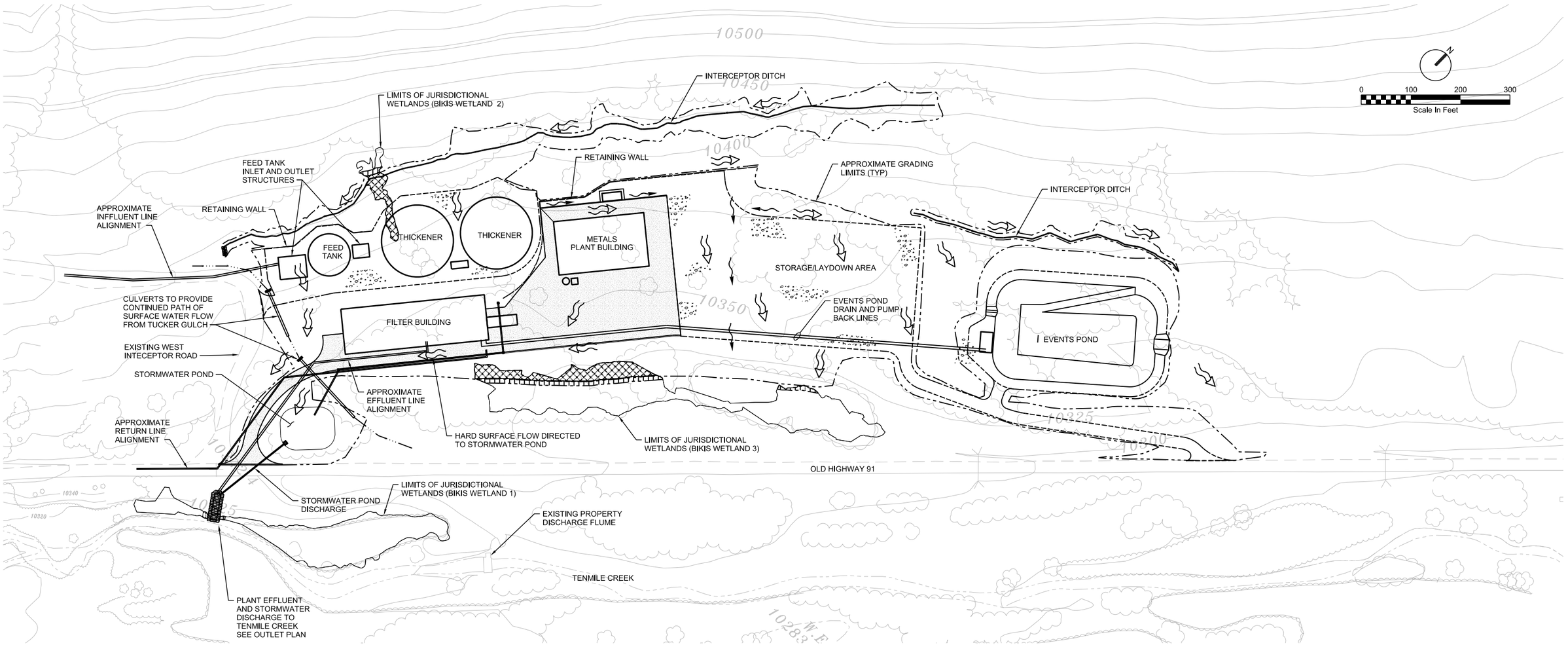
Map Sources:
Aerial Photograph - USDA/FSA, Summer 2005
Wetlands - Bikis Water Consultants, LLC Field Work, June 15, July 19, and August 3, 2011

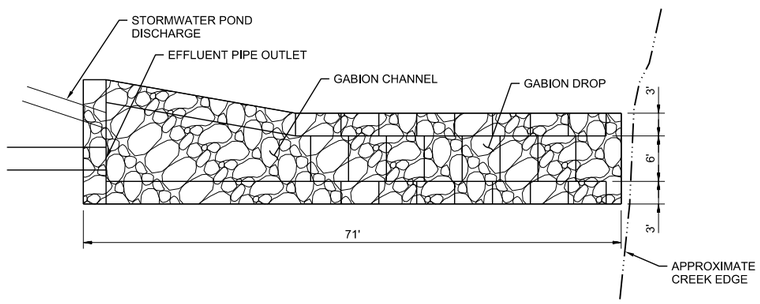
Designed by: DSS
Checked by: DBM
Date: 11/30/2011
Scale: 1:3,600

Climax Molybdenum
PDWTP - Wetland Delineation

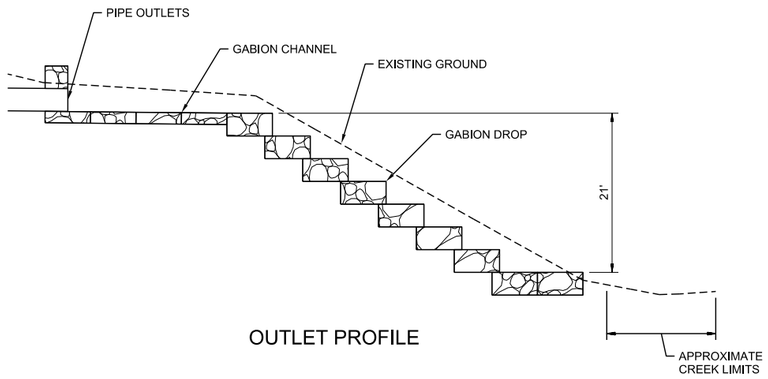
Figure 4

P:\Project Files\162-11 Climax Molybdenum\Mapping\Task01 Climax Mine\ArcMap\PDWTP\1041 Permit\Figure 10 Wetland Delineation.mxd





OUTLET PLAN



OUTLET PROFILE

WETLAND AREA IMPACTS

WETLAND ID	CLASS	IMPACTED	TEMP	TOTAL
WETLAND #1	JURISDICTIONAL	0.010	0.004	0.014
WETLAND #2	JURISDICTIONAL	0.066	0.009	0.075
WETLAND #3	JURISDICTIONAL	0.186	0.091	0.277
	TOTALS	0.262	0.104	0.366

LEGEND

- WETLANDS IMPACTED
- WETLANDS TEMPORARY DISTURBANCE (ASSUMED 10' CONSTRUCTION DISTURBANCE)
- SURFACE FLOW
- INTERCEPTED GROUND WATER FLOW
- ASPHALT PAVEMENT
- GRAVEL SURFACING

Figure 5

Proposed Site Plan and Wetlands Impacts

CH2MHILL

106°9'50"W 106°9'40"W 106°9'30"W 106°9'20"W 106°9'10"W 106°9'W

39°27'10"N 39°27'N 39°26'50"N

Map Legend

- Culvert
- Cross Section
- Proposed Wetland Mitigation Area
- Project Area
- Wetland
- Area with wetland characteristics, but non-jurisdictional (Not adjacent or connected to a water of the U.S.)

Historic Highway

Wetland 3
(1.123 acres)

A

A'

Tenmile Creek

Wetland 2
(0.097 acres)

Proposed Wetland Mitigation Area
(≈0.39 acres)
See Figure 13 for details

Debris flow
spring 2011

Water directed
this way

Wetland 1
(0.687 acres)

Continues

91

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0 150 300 600 Feet

1 inch = 300 feet

Map Sources:
Aerial Photograph - USDA/FSA, Summer 2005
Wetlands - Bikis Water Consultants, LLC, June and July 2011

Designed by: DSS
Checked by: DBM
Date: 11/23/2011
Scale: 1:3,600

Climax Molybdenum
PDWTP - Wetland Mitigation Plan Location Map

Figure 6

P:\Project Files\162-11 Climax Molybdenum\Mapping\Task01 Climax Mine\ArcMap\PDWTP\1041 Permit\Figure 12 Wetland Mitigation Location Map.mxd

39°27'N

A

A'

Existing Wetland

Water Flow Path

45 willows and alders planted for screening (exact planting location may vary)

Historic Highway

Map Legend

- Alder
- Willow
- Water Flow Path
- Road
- Cross Section
- Created Wetland = 0.39 acres (ratio of 1.4 to 1.0)
- Existing Wetland

Wetland Construction:

- Wetland created by excavation to elevation of existing wetland.
- Soil material will be deposited in an upland area.
- Wetland planted with containerized nursery stock 2 feet o.c. with species in planting list.
- See typical cross-section in Figure 8).
- Herbaceous wetland plants will be planted 2-foot, on-center.

Wetland Planting List

Common Name	Scientific Name	Percent Composition	Number
Herbaceous[1]			
Blue-joint reedgrass	*Calamagrostis canadensis*	20	850
Elephant's head	*Pedicularis groenlandica*	5	212
Fowl mannagrass	*Glyceria striata*	10	425
Marsh marigold	*Caltha leptosepala*	15	637
Rocky mountain rush	*Juncus saximontanus*	5	212
Small-wing sedge	*Carex microptera*	10	425
Tufted hairgrass	*Deschampsia cespitosa*	20	849
Water sedge	*Carex aquatilis*	15	637
	Total:	**100%**	**4,247**
Trees and Shrubs[2]			
Alpine birch	*Betula nana*	34	15
Plane leaf willow	*Salix plantifolia*	33	15
Thin leaf alder	*Alnus tenuifolia*	33	15
	Total:	**100%**	**45**

Footnotes:
1) All plants minimum of 4-cubic inch containerized nursery stock.
2) All trees and shrubs minimum of 5-gallon containerized nursery stock.

Notes:
1) BMPs will be installed and maintained through construction per the mine's erosion control plan
2) Water rights requirements will be met by mine's water right portfolio according to state water law.
3) Excavated soil and subsoil will be used on-site or disposed of in an upland area.
4) Site will be monitored for success according to the monitoring plan.

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0 12.5 25 50 Feet

1 inch = 25 feet

Map Sources:
Aerial Photograph - USDA/FSA, Summer 2005
Wetlands - Bikis Water Consultants, LLC, June and July 2011

Designed by: DSS
Checked by: DBM
Date: 11/23/2011
Scale: 1:300

Climax Molybdenum
PDWTP - Wetland Mitigation Plan
Plan View

Figure 7

P:\Project Files\162-11 Climax Molybdenum\Mapping\Task01 Climax Mine\ArcMap\PDWTP\1041 Permit\Figure 13 Wetland Mitigation Details.mxd

APPENDIX A

PDWTP GENERAL ARRANGEMENT DRAWINGS

840-G-001 Metals Removal Building Plan on Ground Floor

840-G-002 Metals Removal Building on Office Floor

840-G-003 Metals Removal Building on Operating Floors

840-G-004 Metals Removal Building Section A

840-G-005 Metals Removal Building Section B

840-G-021 Metals Removal Thickeners Bridge and Tunnel Plans

840-G-022 Metals Removal Thickeners Sections

840-G-031 Metals Filter Building Plans – Ground Floor & Below Grade

840-G-032 Metals Filter Building Operating Floor Plan

840-G-033 Metals Filter Building Sections A & B

840-G-037 Events Pond Pumphouse Plans and Sections

PLANT NORTH

9 BAYS @ 20'-0" = 180'-0"

FIN. PLATFORM EL. 10375'-11¾"

T.O.C H.P. EL. 10361'-0"

THICKENER TUNNEL ROOF DWG 840-G-021

FIN. FL. EL. 10351'8"

840-PU-030 METALS PLANT SUMP PUMP

SUMP O/FLOW

HOIST WELL

840-TK-002 METALS REACTOR TANK NO. 1

840-TK-021 LIME SLURRY TANK

840-PU-021A & 021B LIME SLURRY PUMPS

840-BL-025A & 025B METAL REACTORS AIR BLOWERS

8'x10'H. ROLL-UP DOOR

840-GN-026 DIESEL GENERATOR

OPENING 8'x10'H.

840-PU-022A & 022B FRESH WATER PUMPS

14'x14'H. ROLL-UP DOOR

025A 025B SERVICE CRANE

022A 022B

840-TK-022 FRESH WATER TANK

840-TK-??? SPRING WATER TANK

019A

840-PU-019 METALS FLOCCULANT PUMPS

L.O. TRENCH EL. 10360'-6"

METALS FLOCCULANT STORAGE AREA

840-TK-019 METALS FLOCCULANT STORAGE TANK

021A 021B

840-PU-018 METALS FLOCCULANT TRANSFER PUMP

PIPERACK

840-AG-018 METALS FLOCCULANT MIX TANK AGITATOR

840-TK-018 METALS FLOCCULANT MIX TANK

L.O. TRENCH EL. 10358'-9"

007A 007B

840-PU-007A, & 007B METALS SLUDGE PUMPS

840-TK-003 METALS REACTOR TANK NO. 2

EYEWASH

FLOOR TRENCH (TYPICAL)

009A 009B

840-PU-009A & 009B METALS FILTRATE TANK PUMPS

FORK LIFT

840-FS-001 METALS FLOCCULANT SYSTEM

HOIST WELL

L.O. TRENCH EL. 10360'-6"

840-BN-010A METALS SLUDGE BIN

8'x10'H. ROLL-UP DOOR

840-ML-020 LIME SYSTEM BALL MILL

SAFETY SHOWER

840-CL-020 SLAKED LIME CLASSIFIER

020E 020D

840-TK-020D & 020E LIME SYSTEM PUMPS

T.O.C. H.P. EL. 10361'-0"

12'x10'H. ROLL-UP DOOR

840-AG-020B LIME TRANSFER TANK AGITATOR

840-TK-020B LIME TRANSFER TANK

8'x10'H. ROLL-UP DOOR

SERVICE CRANE

WELDING AREA

WHEEL LOADER

ELECTRICAL SHOP

MECHANICAL SHOP

T.O.C H.P. EL. 10361'-0"

BREAK LINE EL. 10361'-0"

SAFETY SHOWER

840-BN-020 LIME SYSTEM BIN

020A 020B

840-PU-020A & B LIME SYSTEM PUMPS

840-AG-020A LIME SYSTEM TRANSFER TANK AGITATOR

840-TK-020A LIME SYSTEM TRANSFER TANK

LIME TRUCK UNLOADING SHED

840-TK-007 METALS SLUDGE TANK

12'x12'H. ROLL-UP DOOR

840-TK-009 METALS FILTRATE TANK

12'x14'H. ROLL-UP DOOR

14'x14'H. ROLL-UP DOOR

PLANT FEED PIPE FROM PFE

12" DIA. BOLLARD TYPICAL

25'-0" 20'-0" 105'-0" 20'-0" 20'-0" 20'-0"

A 840-C-004 B 840-P-GA-005 C 840-C-006 D 840-C-007 E 840-C-008 F 840-C-009 G 840-C-010

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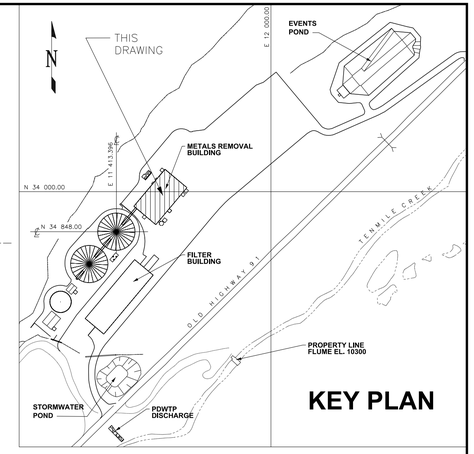


KEY PLAN

MARK	DESCRIPTION	DATE	BY	CHK.
C	GENERAL REVISION, ISSUED FOR DESIGN.	05DEC11	ABE	
B	DWG No. WAS 840-P-GA-001, REVISED PER CLIENT COMMENTS, ISSUED FOR ESTIMATE.	10AUG11	ABE	NONE
A	ISSUED FOR REVIEW AND APPROVAL	18JUL11	ABE	NONE

REVISIONS

NUMBER	TITLE	NUMBER	TITLE

REFERENCE DRAWINGS

Climax Molybdenum A Freeport-McMoRan Company — CLIMAX, COLORADO

CH2MHILL — MINING AND MINERALS GREENWOOD VILLAGE, COLORADO

CLIMAX MINE
PDWTP PROJECT
GENERAL ARRANG'T – METALS REMOVAL BUILDING PLAN ON GROUND FLOOR @ EL. 10361'-0" NOM.

DESIGNED BY: ENG. DATE: A. EDMONSTONE	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: ENG. DATE: 0-0-00	DWG. SCALE: 1/8"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-001	REV. C

PLANT NORTH

9 BAYS @ 20'-0" = 180'-0"

BLOWER INTAKES

840-PV-027 POTABLE WATER TANK

POTABLE WATER ACCUMULATOR

840-CM-024 PLANT AIR COMPRESSOR

FIN. PLATFORM EL. 10375'-11¾"

840-SB-001 METALS SPLITTER BOX

FIN. FLR EL. 10378'-8"

840-TK-021 LIME SLURRY TANK

840-TK-002 METALS REACTOR TANK #1

GENERATOR VENTILATION

SAFETY SHOWER

OPEN

PROCESS WATER ACCUMULATOR

840-WT-027 WATER TREATMENT SYSTEM (R.O.)

FIN. FLR EL. 10378'-8"

HOIST WELL

FIN. PLATFORM EL. 10379'-1"

PIPE RACK

METALS SLUDGE DEWATERING PRESS DISCHARGE CHUTE

840-TK-007 METALS SLUDGE TANK

840-TK-009 METALS FILTRATE TANK

840-TK-003 METALS REACTOR TANK #2

HOIST WELL

HOIST WELL

LABORATORY

SAFETY SHOWER

FIN. FLR. EL. 10379'-1"

WINDOWS

HALLWAY

WOMENS CHANGE/ RESTROOM

MENS CHANGE/ RESTROOM

BREAK ROOM

OFFICE

CONFERENCE

OFFICE

CONTROL ROOM

MCC ROOM

UPS ROOM

FIN. FLR. EL. 10379'-1"

FIN. FLR. EL. 10379'-1"

LADDER DOWN

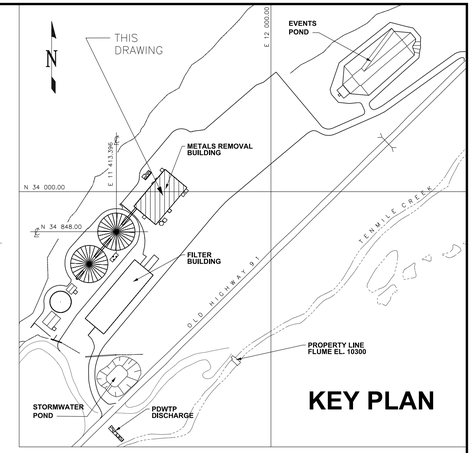
840-BN-020 LIME SYSTEM BIN

SAFETY SHOWER

840-SK-020 LIME SLAKER (BELOW)

840-VB-020 BIN ACTIVATOR

840-C-004 | 840-C-006 | 840-C-007 | 840-C-008 | 840-C-009 | 840-C-010 | 840-P-GA-005



0 8 16 24
8 4

MARK	DESCRIPTION	DATE	BY	CHK.
C	DRAWING REVISED AND REDRAWN, ISSUED FOR DESIGN.	05DEC11	ABE	
B	DWG No. WAS 840-P-GA-002, REVISED PER CLIENT COMMENTS, ISSUED FOR ESTIMATE	10AUG11	ABE	NONE
A	ISSUED FOR REVIEW AND APPROVAL	18JUL11	ABE	NONE

REVISIONS

NUMBER	TITLE	NUMBER	TITLE

REFERENCE DRAWINGS

Climax Molybdenum — A Freeport-McMoRan Company — CLIMAX, COLORADO

CH2MHILL — MINING AND MINERALS GREENWOOD VILLAGE, COLORADO

CLIMAX MINE
PDWTP PROJECT
GENERAL ARRANG'T – METALS REMOVAL BUILDING PLAN ON OFFICE FLOOR @ EL. NOTED

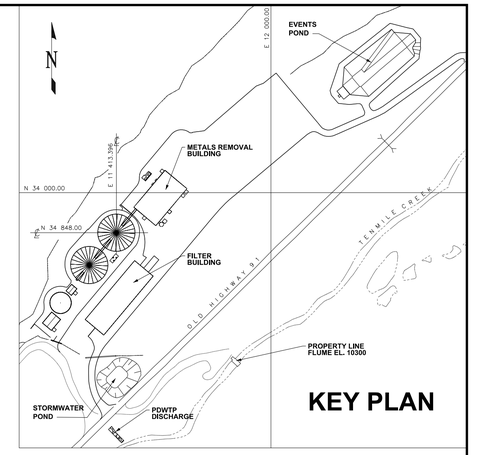
DESIGNED BY: ENG. DATE: A. EDMONSTONE	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: ENG DATE: 0-0-00	DWG. SCALE: 1/8"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-002	REV. C

PLANT NORTH

9 BAYS @ 20'-0" = 180'-0"

840-SB-001 FLOW SPLITTER BOX
840-TK-002 METALS REACTOR TANK #1
840-AG-002 METALS REACTOR TANK #1 AGITATOR
PLANT FEED PIPE
FIN. PLATFORM EL. 10402'-1¼"
840-AG-021 LIME SLURRY TANK AGITATOR
840-TK-021 LIME SLURRY TANK
PFE PLANT FEED PIPE
PARSHALL FLUMES
FIN. PLATFORM EL. 10395'-10⅝"
FIN. PLATFORM EL. 10393'-2½"
HOIST WELL
840-TK-004 METALS MIX TANK
840-AG-004 METALS MIX TANK AGITATOR
RAMP UP
A 840-C-004
PIPE RACK
FIN. PLATFORM EL. 10400'-5⅜"
840-TK-003 METALS REACTOR TANK #2
FIN. PLATFORM EL. 10389'-10⅝"
840-TK-007 METALS SLUDGE TANK
840-AG-007 METALS SLUDGE TANK AGITATOR
840-CN-026 BRIDGE CRANE
840-AG-003 METALS REACTOR TANK #2 AGITATOR
STAIR TO ROOF
FIN. FLR. EL. 10391'-7"
HVAC UNITS (LABORITORY)
HOIST WELL
LADDER UP TO CRANE (BY CRANE MF)
HOIST WELL
OPEN
POSSIBLE FUTURE FILTER
FIN. PLATFORM EL. 10391'-7"
840-FL-008 METALS SLUDGE DEWATERING PRESS
T.O. CURB EL. 10391'-7"
FIN. FLR. EL. 10391'-1"
FLOOR DRAIN (TYPICAL)
FIN. PLATFORM EL. 10407'-4" (CRANE ACCESS)
HVAC UNITS (OFFICES)
OFFICE SHOP AREA ROOF
HVAC UNITS (MCC ROOM)
BATTERY ROOM VENTILATOR
PLANT FEED PIPE FROM PFE
B 840-P-GA-005
840-BN-020 LIME SYSTEM BIN
840-DC-020 LIME SYSTEM BAGHOUSE
FIN. PLATFORM EL. 10417'-0" (BIN ACCESS)
FIN. FLR. EL. 10391'-7"
C 840-C-006
D 840-C-007
E 840-C-008
F 840-C-009
G 840-C-010

25'-0" 20'-0" 20'-0" 20'-0" 20'-0" 105'-0"



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8 4

MARK	DESCRIPTION	DATE	BY	CHK.
C	DRAWING WAS SECTION A-A, REDRAWN AND ISSUED FOR DESIGN.	05DEC11	ABE	
B	DWG No. WAS 840-P-GA-003, REVISED PER CLIENT COMMENTS, ISSUED FOR ESTIMATE	10AUG11	ABE	NONE
A	ISSUED FOR REVIEW AND APPROVAL	18JUL11	ABE	NONE

REVISIONS

NUMBER	TITLE	NUMBER	TITLE

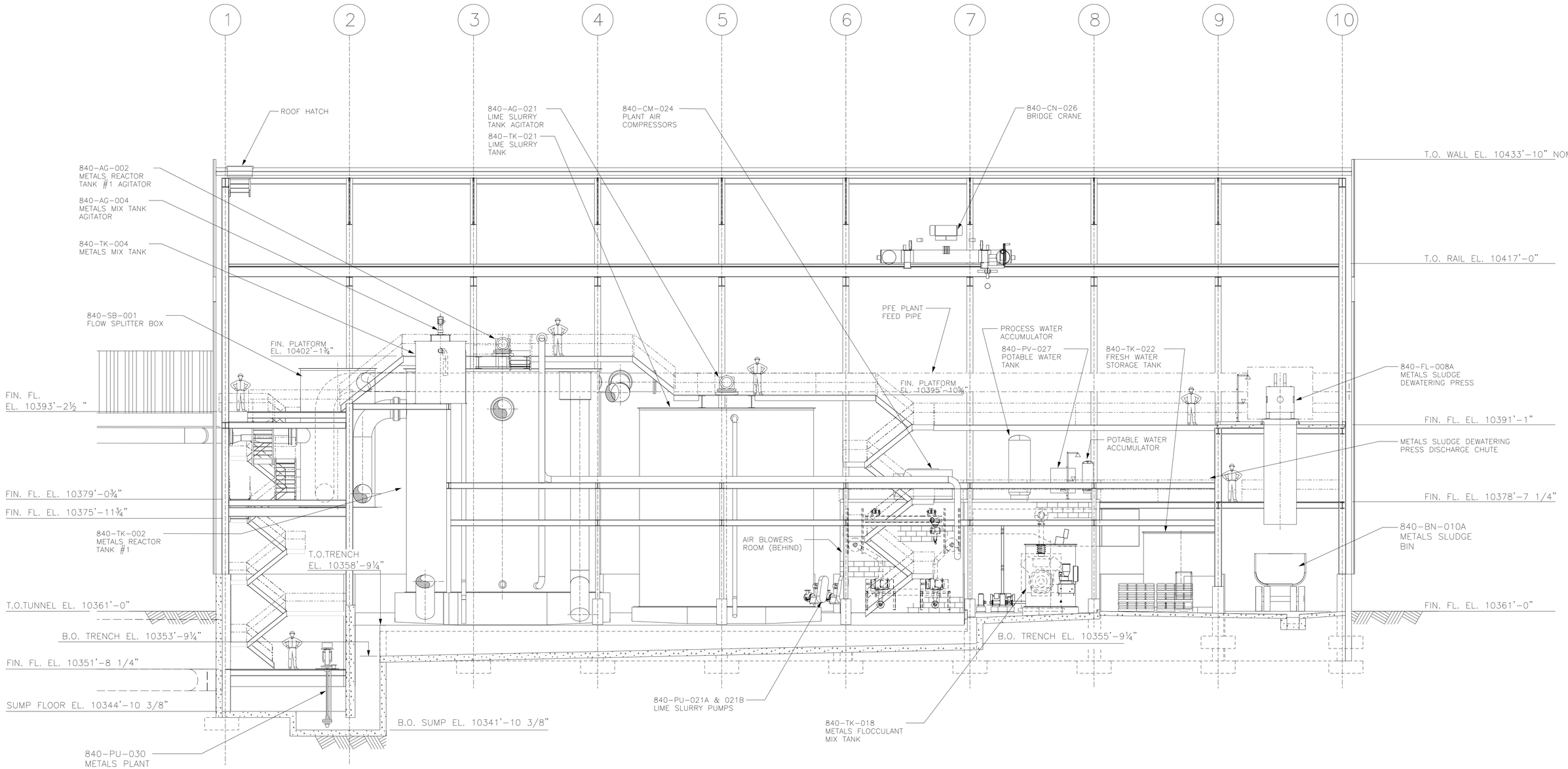
REFERENCE DRAWINGS

Climax Molybdenum A Freeport-McMoRan Company — CLIMAX, COLORADO

CH2MHILL — MINING AND MINERALS GREENWOOD VILLAGE, COLORADO

CLIMAX MINE
PDWTP PROJECT
GENERAL ARRANG'T – METALS REMOVAL BUILDING PLAN ON OPERATING FLOORS @ EL. NOTED

DESIGNED BY: ENG. DATE: A. EDMONSTONE	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: ENG DATE: 0-0-00	DWG. SCALE: ⅛"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-003	REV. C



SECTION A-A
840-G-001, 002, 003

0 8 16 24
8 4

MARK	DESCRIPTION	DATE	BY	CHK.
C	DRAWING WAS SECTION B-B, REDRAWN AND ISSUED FOR DESIGN	05DEC11	ABE	
B	DWG No. WAS 840-P-GA-002, REVISED PER CLIENT COMMENTS, ISSUED FOR ESTIMATE	10AUG11	ABE	NONE
A	ISSUED FOR REVIEW AND APPROVAL	18JUL11	ABE	NONE

REVISIONS

NUMBER	TITLE	NUMBER	TITLE

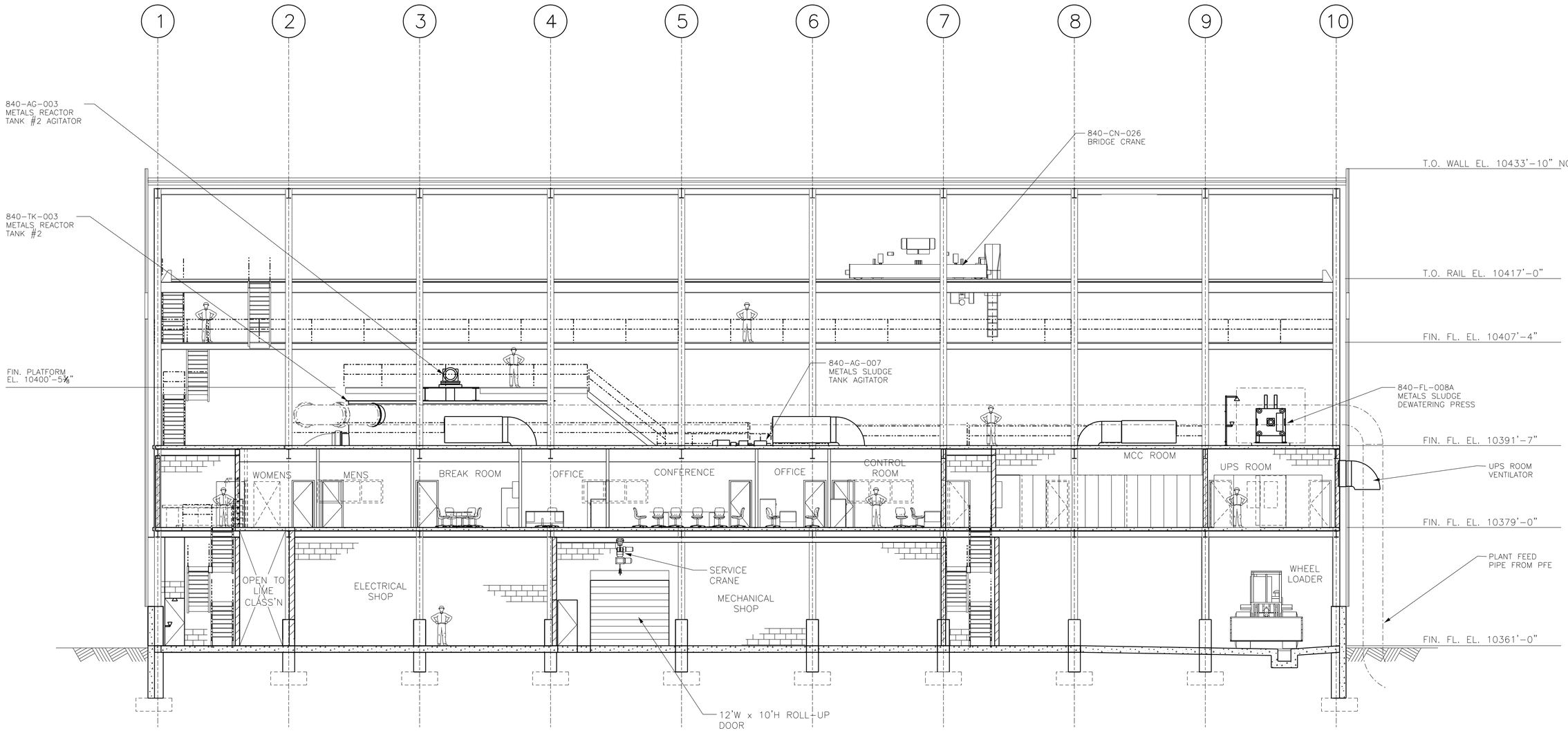
REFERENCE DRAWINGS

Climax Molybdenum
A Freeport-McMoRan Company
CLIMAX, COLORADO

CH2MHILL
MINING AND MINERALS
GREENWOOD VILLAGE,
COLORADO

CLIMAX MINE
PDWTP PROJECT
GENERAL ARRANG'T – METALS REMOVAL BUILDING
SECTION A-A

DESIGNED BY: ENG. DATE: A. EDMONSTONE	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: ENG. DATE: 0-0-00	DWG. SCALE: 1/8"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-004	REV. C



SECTION B-B

840-G-001, 002, 003

0 8 16 24

8 4

MARK	DESCRIPTION	DATE	BY	CHK.
C	DRAWING WAS SECTIONS C-C & D-D, REDRAWN AND ISSUED FOR DESIGN	05DEC11	ABE	
B	DWG No. WAS 840-P-GA-005, REVISED PER CLIENT COMMENTS, ISSUED FOR ESTIMATE	10AUG11	ABE	NONE
A	ISSUED FOR REVIEW AND APPROVAL	18JUL11	ABE	NONE

REVISIONS

NUMBER	TITLE

REFERENCE DRAWINGS

Climax Molybdenum
A Freeport-McMoRan Company

CLIMAX, COLORADO

CH2MHILL®

MINING AND MINERALS
GREENWOOD VILLAGE,
COLORADO

CLIMAX MINE
PDWTP PROJECT
GENERAL ARRANG'T – METALS REMOVAL BUILDING
SECTION B-B

DESIGNED BY: ENG. DATE: A. EDMONSTONE	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: ENG DATE: 0-0-00	DWG. SCALE: ⅛"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-005	REV. C

PLANT NORTH

160'-0" C/C THICKENERS

118'-6"

℄ THICKENER

℄ THICKENER

1

F

A

840-P-GA-022

℄ THICKENERS

RAKE MECHANISM

RAKE MECHANISM

840-PU-006E
METALS FLOCCULANT
DILUTION PUMP #2
WITH REMOVAL
WINCH

840-PU-005E
METALS FLOCCULANT
DILUTION PUMP #1
WITH REMOVAL
WINCH

840-TH-006
METALS THICKENER
NO. 2

840-TH-005
METALS THICKENER
NO. 1

123'-0"

50'-0 7/8 "

12'-0" INS

9'-4"

NO.1 THICKENER FEED
PIPE (UNDER BRIDGE)

NO.2 THICKENER
FEED PIPE

METALS REMOVAL
BUILDING

O/FLOW BYPASS

O/FLOW COLLECTION BOX

ESCAPE TUNNEL
8'0" DIA. CMP

OVERFLOW FEED
TO FILTERS

32'-5 1/2 " INS

63'-9 1/4 "

B

840-P-GA-022

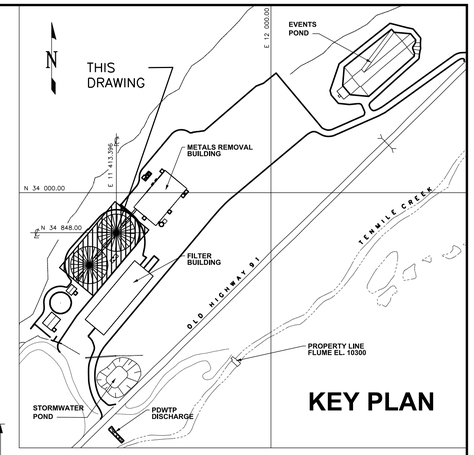
B

840-P-GA-022

FILTER BUILDING

A

PLAN - THICKENERS BRIDGE FIN. EL. 10393'-1¼"



℄ THICKENER #2

℄ THICKENER #1

24'-0" INS.

15'-8 5/8 "

840-PU-006A & 006B
METALS SLUDGE
RECYCLE PUMPS #2

840-PU-005A & 005B
METALS SLUDGE
RECYCLE PUMPS #1

SERVICE MONORAIL
WITH MANUAL TROLLEY

RAKE MECHANISM
CENTER SUPPORT

℄ THICKENERS

40'-0" INS.
TYPICAL

20'-0"

006A 006B

005A 005B

006C

005C

006D

005D

840-PU-006C & 006D
METALS SLUDGE
WASTING PUMPS #2

SLOPE

SLOPE

SLOPE

SLOPE

12'W. x 8'H.
TUNNEL

12'W. x 8'H.
TUNNEL

LIP OF SUMP
EL. 10351'-2"

LIP OF SUMP
EL. 10351'-2"

840-PU-005C & 005D
METALS SLUDGE
WASTING PUMPS #1

840-PU-0??
THICKENER #2
SUMP PUMP

840-PU-0??
THICKENER #1
SUMP PUMP

RAMP UP

ESCAPE TUNNEL
8'0" DIA. CMP

1

F

9'-4"

TOP OF TUNNEL
EL. 10361'-0"

PLAN - THICKENERS TUNNEL EL. 10351'-8" NOM.

0 16 32 48
16 8

MARK	DESCRIPTION	DATE	BY	CHK.
REVISIONS				

MARK	DESCRIPTION	DATE	BY	CHK.
REVISIONS				

MARK	DESCRIPTION	DATE	BY	CHK.
C	DRAWING WAS 840-G-006, REVISED AND REDRAWN, ISSUED FOR DESIGN.	05DEC11	ABE	
B	DWG No. WAS 840-P-GA-006, REVISED PER CLIENT COMMENTS, ISSUED FOR ESTIMATE	10AUG11	ABE	NONE
A	ISSUED FOR REVIEW AND APPROVAL	14JUL11	ABE	NONE
REVISIONS				

NUMBER	TITLE	NUMBER	TITLE
REFERENCE DRAWINGS			

Climax Molybdenum
A Freeport-McMoRan Company

CLIMAX, COLORADO

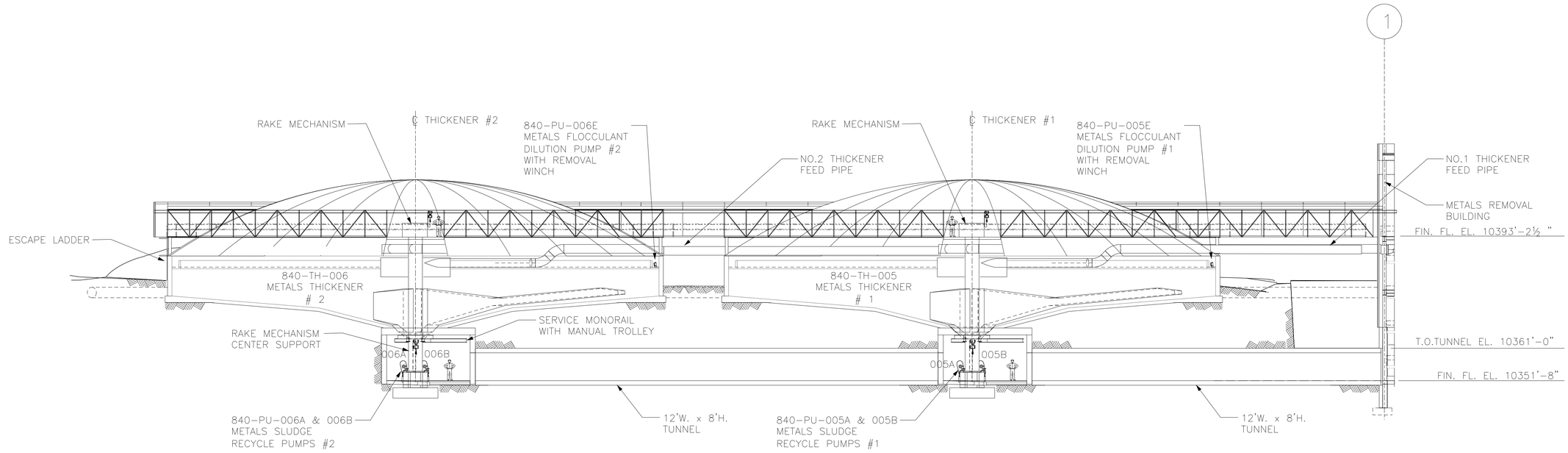
CH2MHILL

MINING AND MINERALS
GREENWOOD VILLAGE,
COLORADO

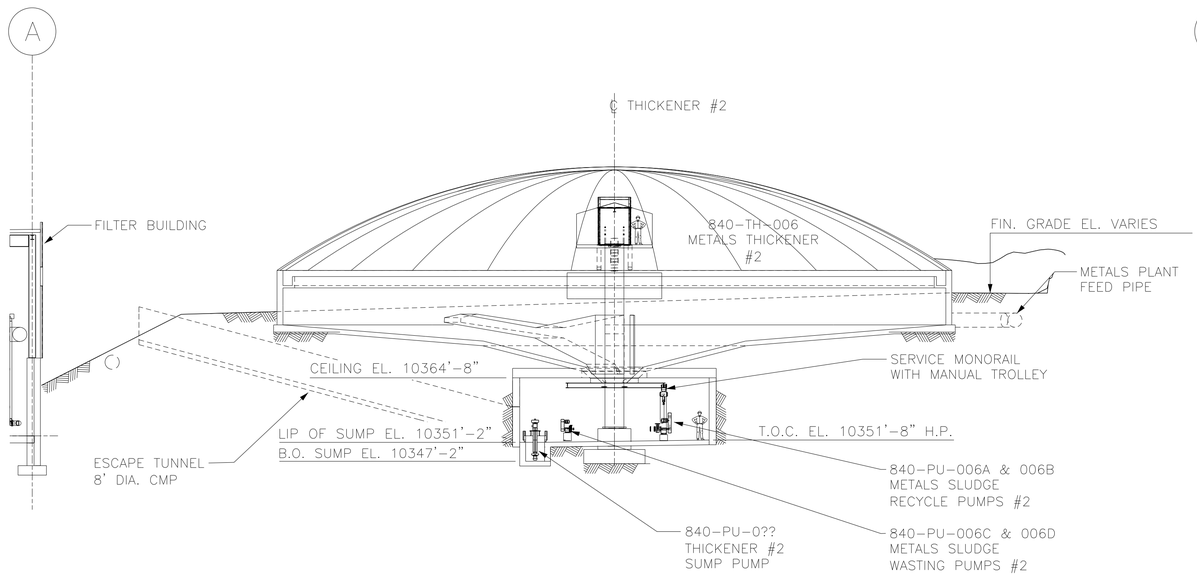
CLIMAX MINE
PDWTP PROJECT

GENERAL ARRANG'T-METALS REMOVAL THICKENERS BRIDGE AND TUNNEL PLANS

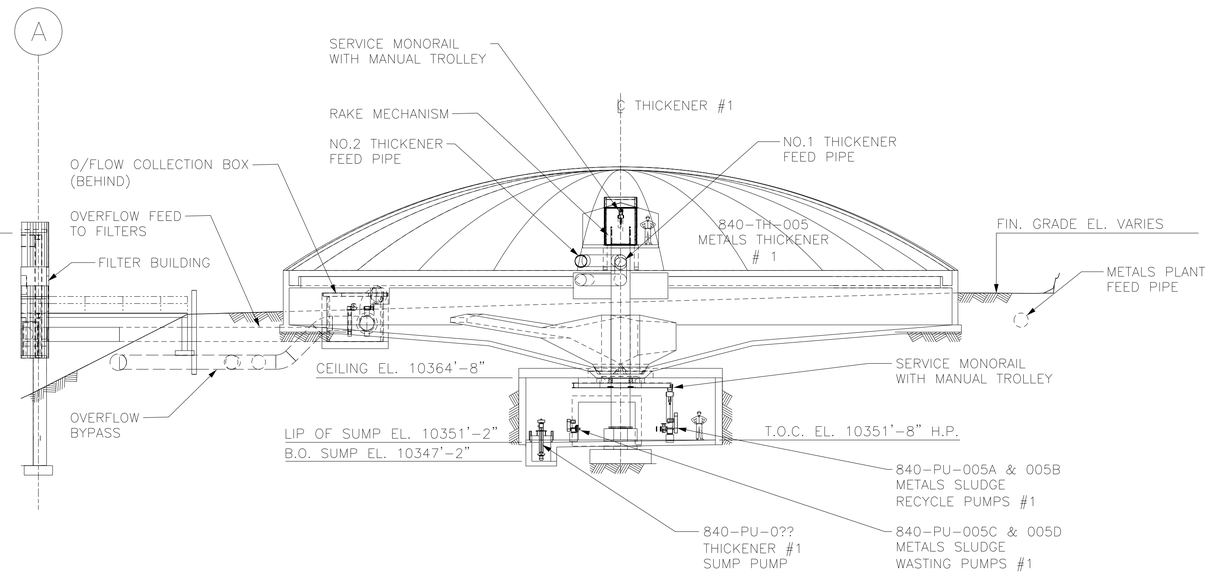
DESIGNED BY: ENG. DATE: A. EDMONSTONE	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: ENG. DATE: 0-0-00	DWG. SCALE: 1/16"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-021	REV. C



SECTION A-A
840-G-021



SECTION B-B
840-G-021



SECTION C-C
840-G-021

MARK	DESCRIPTION	DATE	BY	CHK.
	REVISIONS			

MARK	DESCRIPTION	DATE	BY	CHK.
	REVISIONS			

MARK	DESCRIPTION	DATE	BY	CHK.
A	ISSUED FOR DESIGN	09DEC11	ABE	
	REVISIONS			

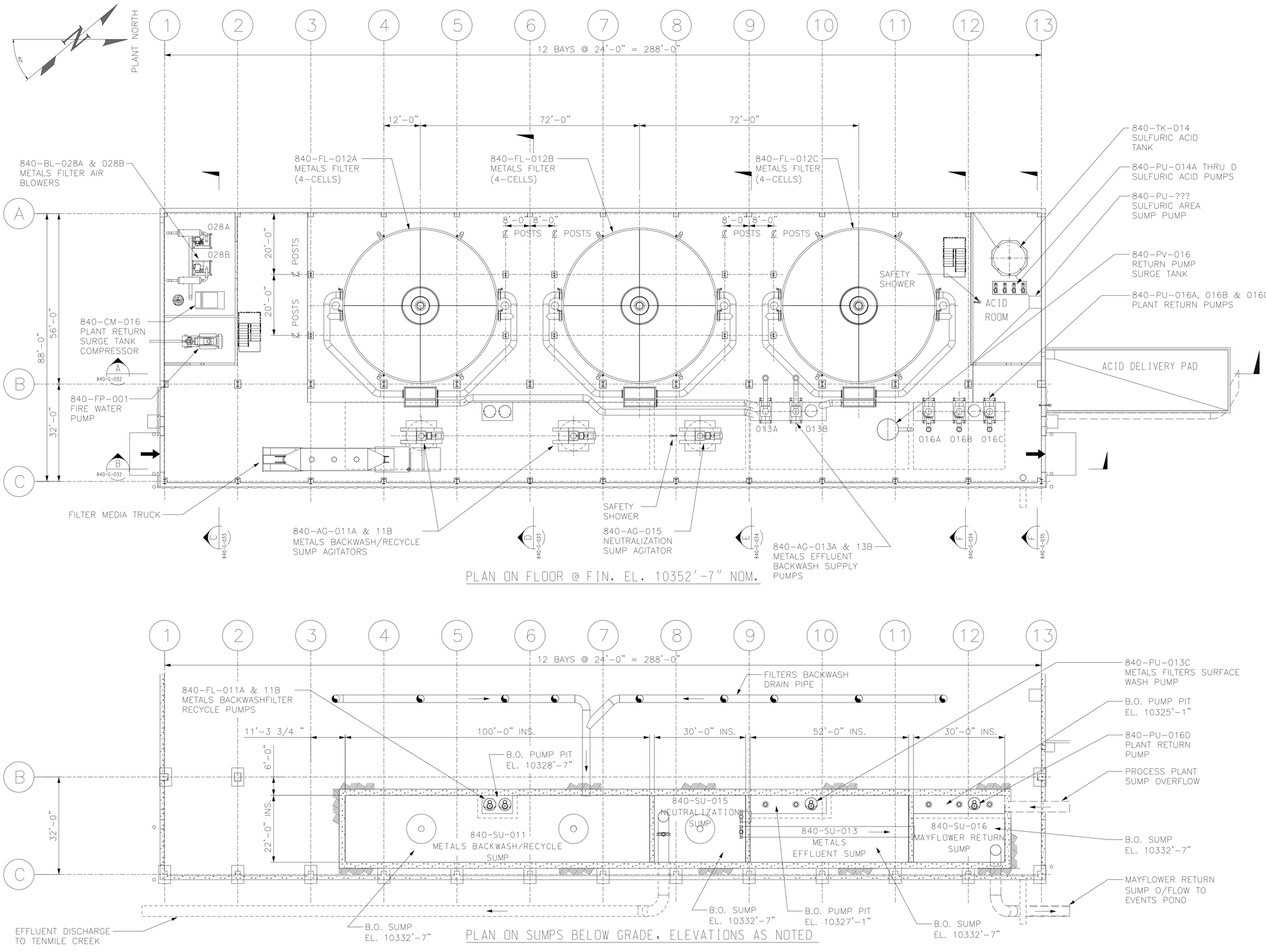
NUMBER	TITLE	NUMBER	TITLE
	REFERENCE DRAWINGS		

Climax Molybdenum
A Freeport-McMoRan Company
CLIMAX, COLORADO

CH2MHILL
MINING AND MINERALS
GREENWOOD VILLAGE,
COLORADO

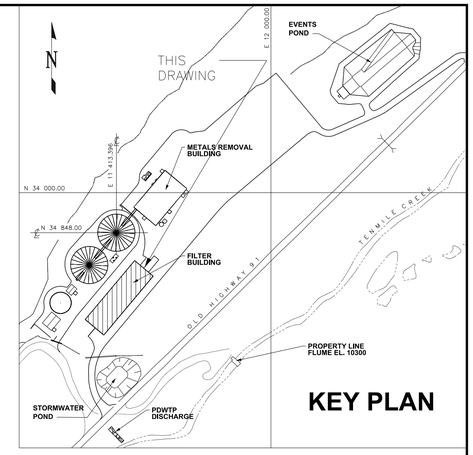
CLIMAX MINE
PDWTP PROJECT
GENERAL ARRANG'T-METALS REMOVAL THICKENERS
SECTIONS

DESIGNED BY: ENG. DATE: A. EDMONSTONE	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: ENG DATE: 0-0-00	DWG. SCALE: 1/16" =1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-022	REV. A



PLAN ON FLOOR @ FIN. EL. 10352'-7" NOM.

PLAN ON SUMPS BELOW GRADE, ELEVATIONS AS NOTED



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16 8

MARK	DESCRIPTION	DATE	BY	CHK.
A	DRAWING WAS 840-D-007, REDRAWN AND ISSUED FOR DESIGN.	02DEC11	ABE	
B	DWG No. WAS 840-P-GA-007, REVISED PER CLIENT COMMENTS, ISSUED FOR ESTIMATE	10AUG11	ABE	NONE
A	ISSUED FOR REVIEW AND APPROVAL	14JUL11	ABE	NONE

REVISIONS

NUMBER	TITLE	NUMBER	TITLE

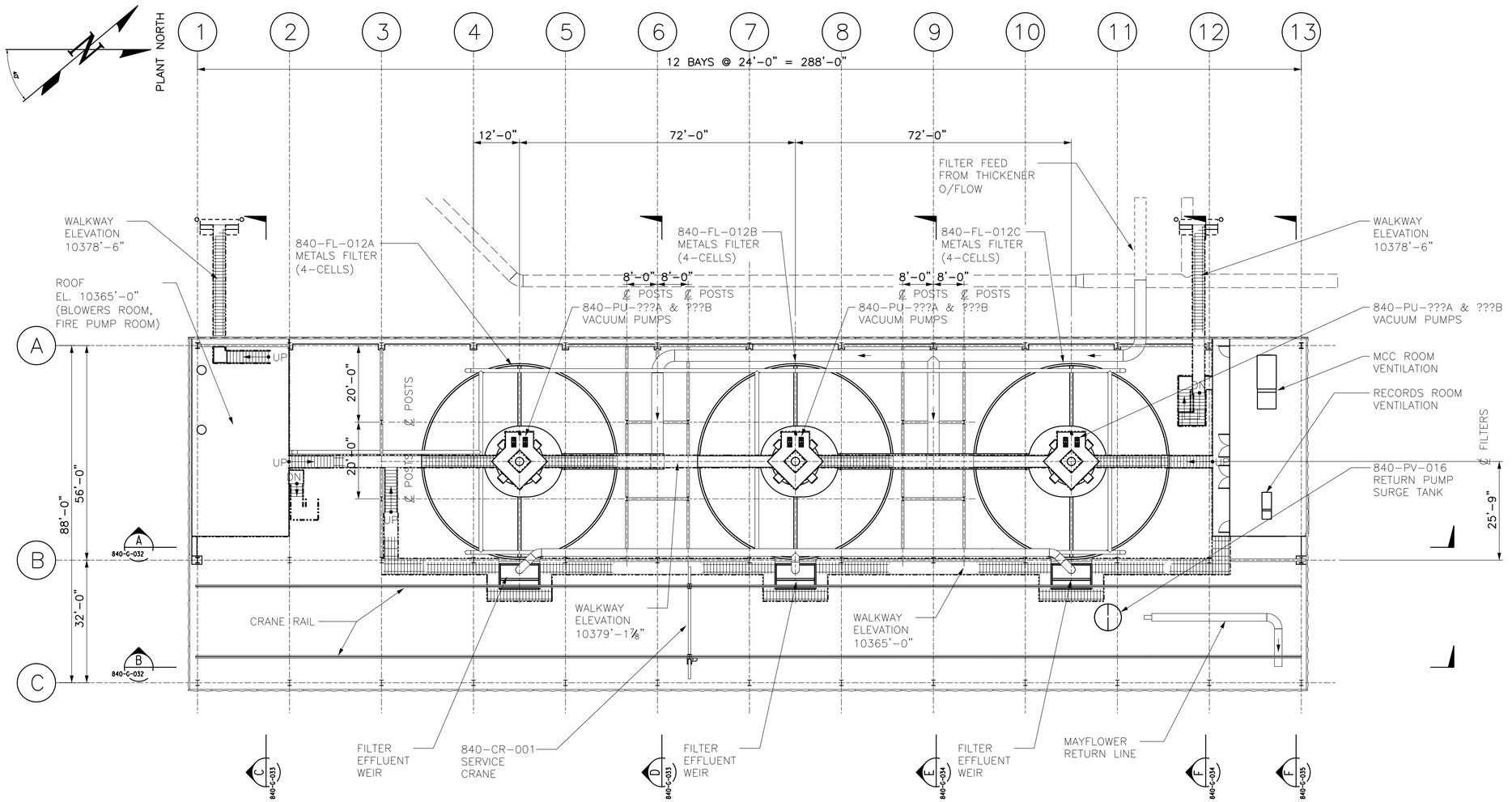
REFERENCE DRAWINGS

Climax Molybdenum
A Freeport-McMoRan Company
CLIMAX, COLORADO

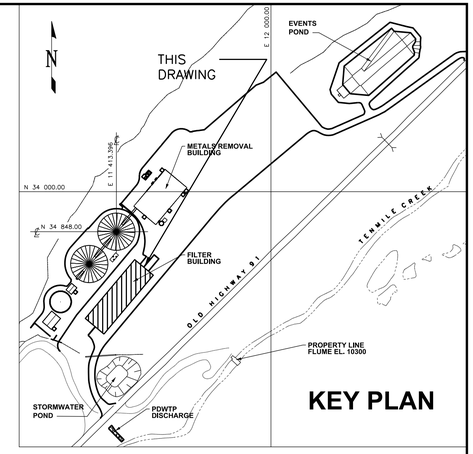
CH2MHILL
MINING AND MINERALS
GREENWOOD VILLAGE,
COLORADO

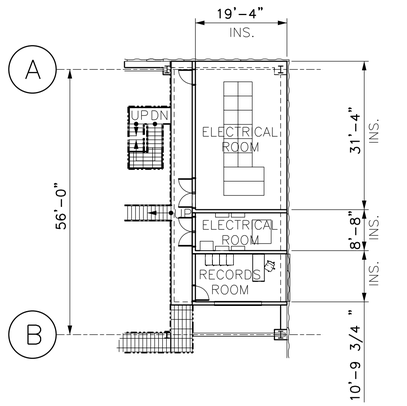
CLIMAX MINE
PDWTP PROJECT
GENERAL ARRANG'T-METALS FILTER BUILDING
PLANS – GROUND FLOOR & BELOW GRADE

DESIGNED BY: ENG. A. EDMONSTONE DATE:	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER A. EDMONSTONE DATE:	PLOT SCALE: NONE
CHECKED BY: ENG DATE: 0-0-00	DWG. SCALE: 1/16"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-031	REV. C



PLAN ON ELEVATED FLOORS @ FIN. EL. AS NOTED





PLAN ON FLOOR @ FIN. EL. 10365'-0"

0 16 32 48
16 8

MARK	DESCRIPTION	DATE	BY	CHK.
A	FILTERS CHANGED, REDRAWN ISSUED FOR DESIGN.	12DEC11	ABE	

REVISIONS

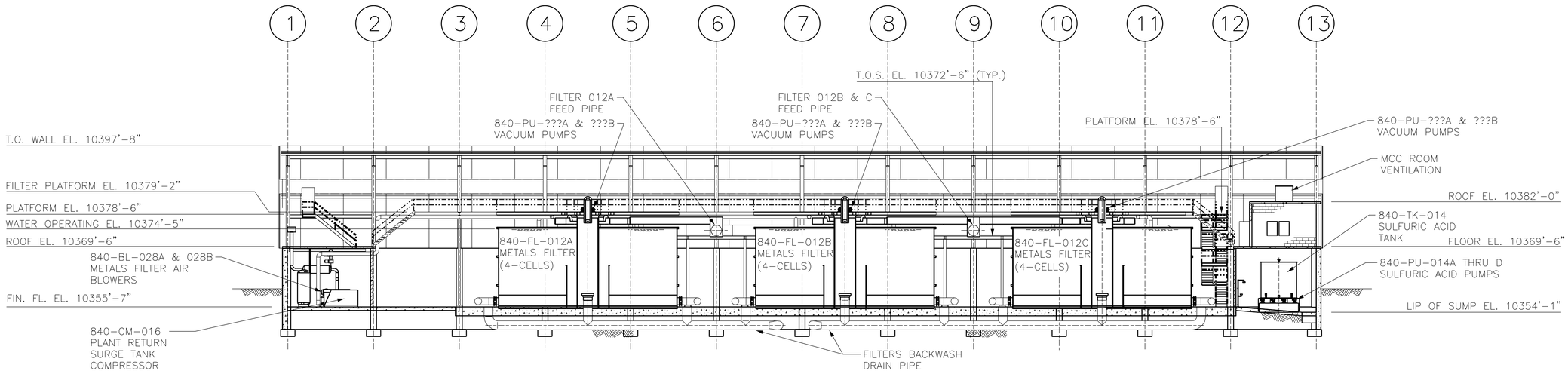
REFERENCE DRAWINGS

Climax Molybdenum — A Freeport-McMoRan Company — CLIMAX, COLORADO

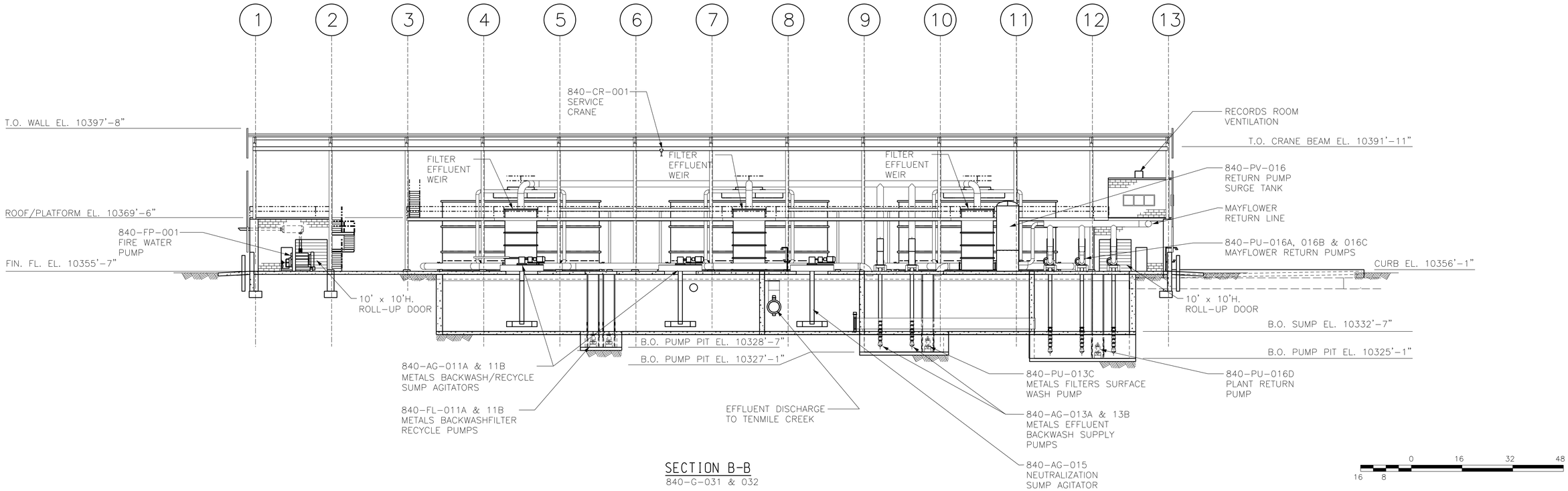
CH2MHILL — MINING AND MINERALS GREENWOOD VILLAGE, COLORADO

CLIMAX MINE
PDWTP PROJECT
GENERAL ARRANG'T-METALS FILTER BUILDING OPERATING FLOOR PLAN

DESIGNED BY: ENG. DATE: A. EDMONSTONE	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: ENG DATE: 0-0-00	DWG. SCALE: 1/16"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-032	REV. A



SECTION A-A
840-G-031 & 032



SECTION B-B
840-G-031 & 032

0 16 32 48
16 8

MARK	DESCRIPTION	DATE	BY	CHK.
	REVISIONS			

MARK	DESCRIPTION	DATE	BY	CHK.
	REVISIONS			

MARK	DESCRIPTION	DATE	BY	CHK.
A	ISSUED FOR REVIEW	07NOV11	ABE	NONE
	REVISIONS			

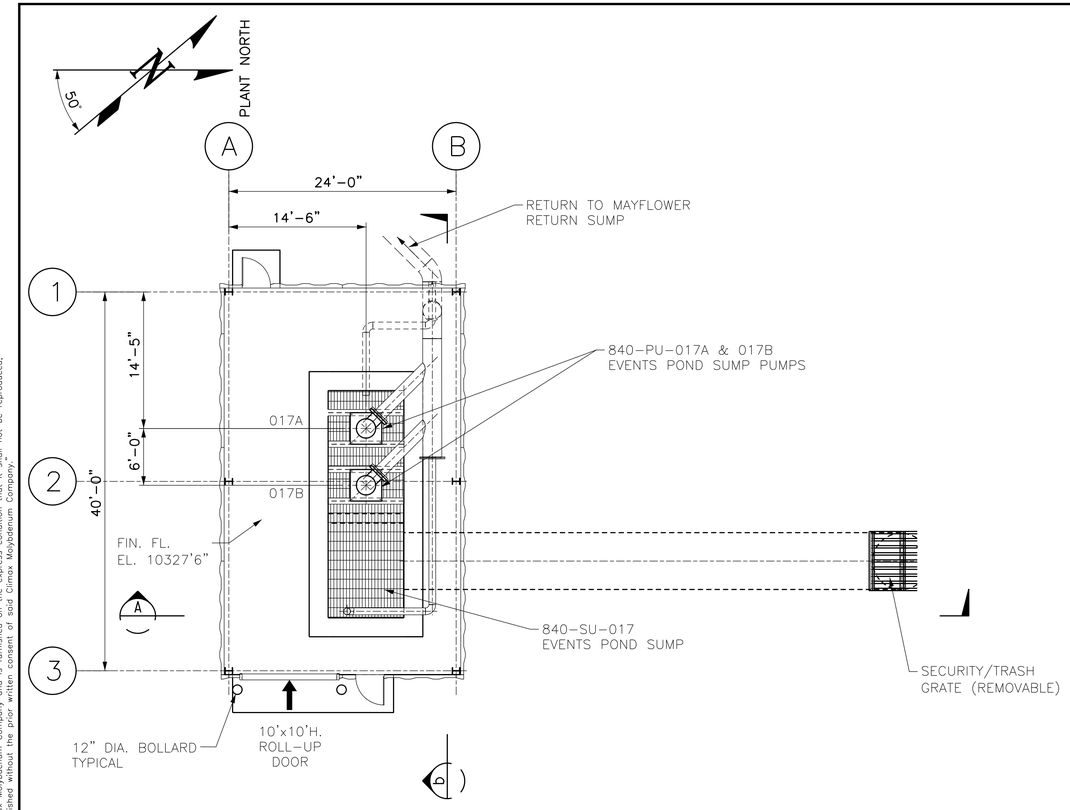
NUMBER	TITLE	NUMBER	TITLE
	REFERENCE DRAWINGS		

Climax Molybdenum
A Freeport-McMoRan Company
CLIMAX, COLORADO

CH2MHILL
MINING AND MINERALS
GREENWOOD VILLAGE, COLORADO

CLIMAX MINE
PDWTP PROJECT
GENERAL ARRANG'T-METALS FILTER BUILDING
SECTIONS A-A & B-B

DESIGNED BY: ENG. DATE: A. EDMONSTONE	APPROVED BY: ENG. DATE: 0-0-00
DRAWN BY: DRAFTER DATE: A. EDMONSTONE	PLOT SCALE: NONE
CHECKED BY: ENG DATE: 0-0-00	DWG. SCALE: 1/16"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-033	REV. A



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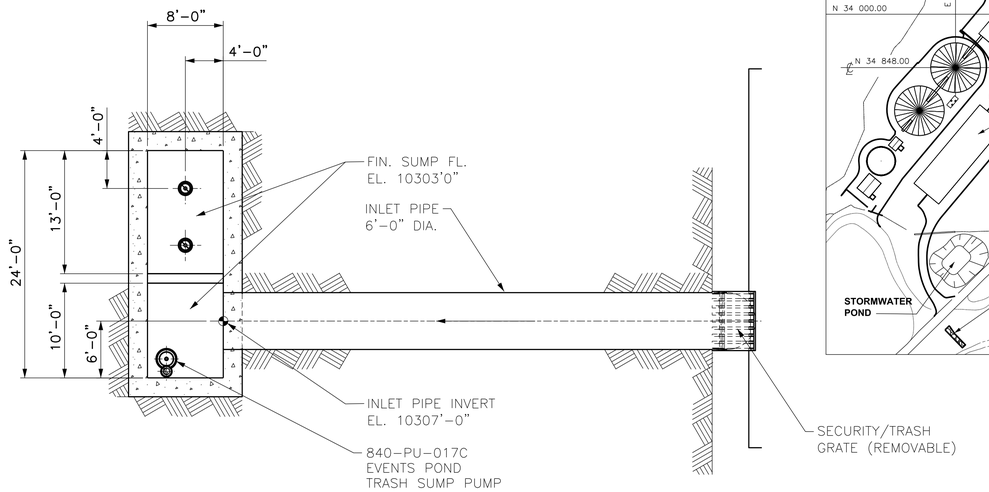

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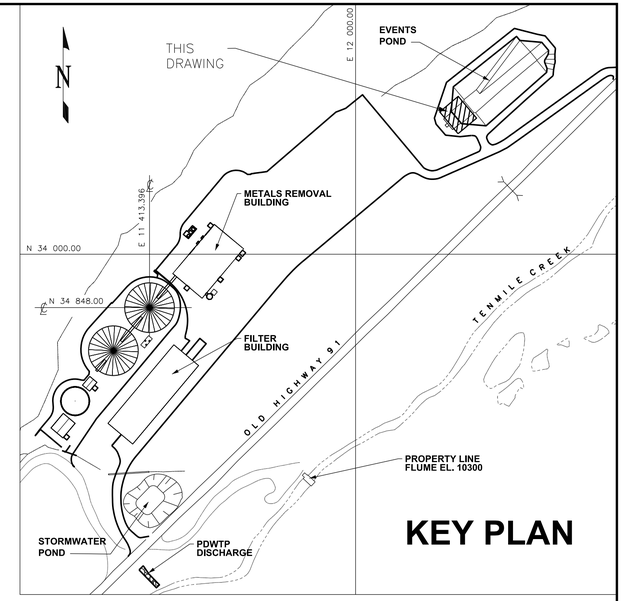

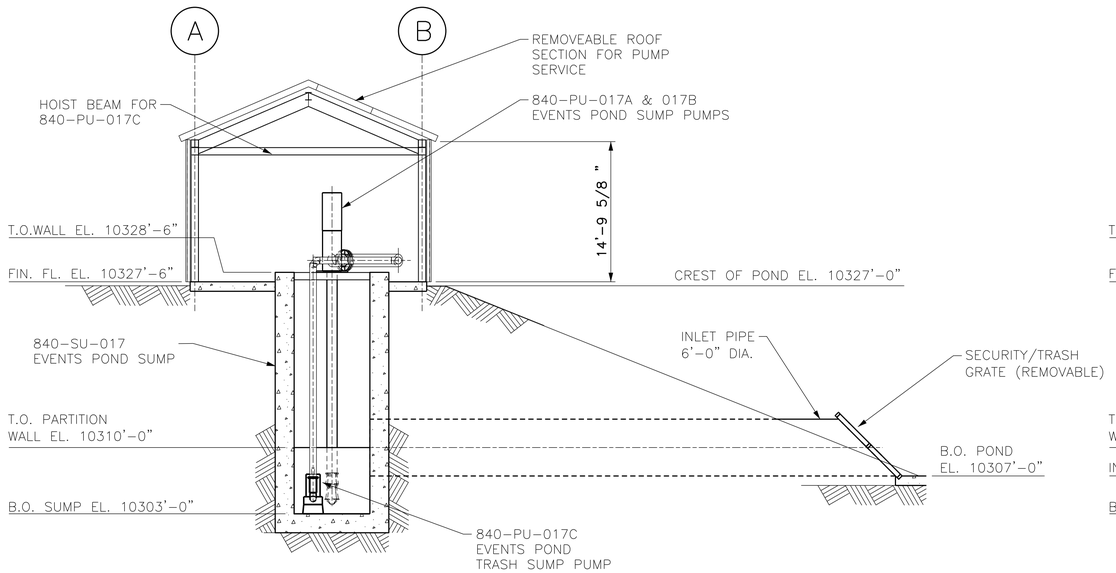

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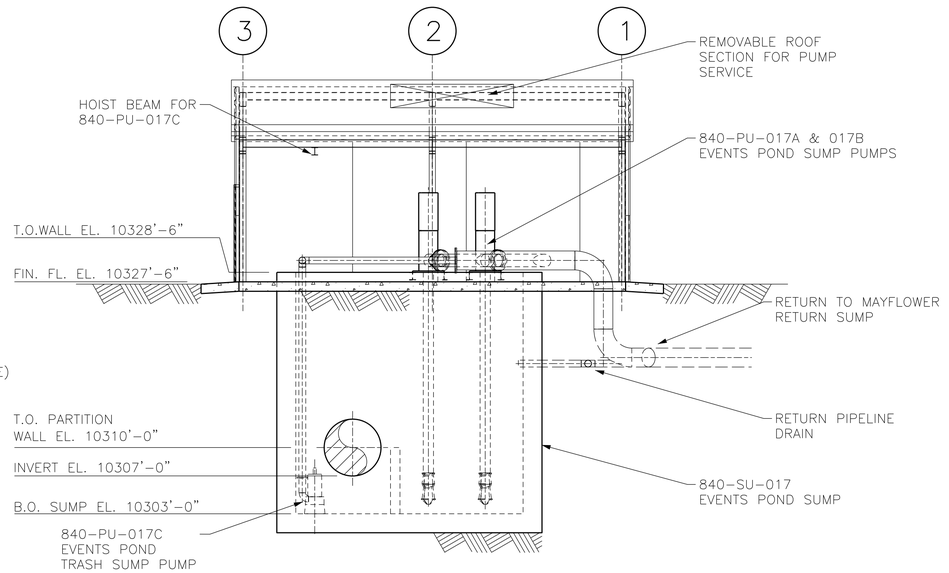

SECTION B-B

MARK	DESCRIPTION	DATE	BY	CHK.
A	ISSUED FOR REVIEW AND APPROVAL	23DEC11	ABE	

REVISIONS

REFERENCE DRAWINGS

Climax Molybdenum — A Freeport-McMoRan Company — CLIMAX, COLORADO

CH2MHILL — MINING AND MINERALS GREENWOOD VILLAGE, COLORADO

CLIMAX MINE

PDWTP PROJECT

GENERAL ARRANG'T-EVENTS POND PUMPHOUSE PLANS AND SECTIONS

DESIGNED BY: A. EDMONSTONE DATE:	APPROVED BY: DATE:
DRAWN BY: A. EDMONSTONE DATE:	PLOT SCALE: NONE
CHECKED BY: DATE:	DWG. SCALE: ½"=1'-0"
CHARGE: 421904	
DRAWING NO. 840-G-037	REV. A

APPENDIX B

WETLAND MITIGATION PLAN

BĪKIS
Water Consultants LLC

PRELIMINARY WETLAND MITIGATION PLAN CLIMAX MOLYBDENUM PDWTP PROJECT (CORPS PROJECT NO. SPK-2011-00907)

Prepared for:
Mr. Raymond Lazuk
Climax Molybdenum
Highway 91 - Fremont Pass
Climax, CO 80429

Prepared by:
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December 2011

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1.0 INTRODUCTION/PURPOSE

This Preliminary Wetland Mitigation Plan (Plan) was prepared to describe the mitigation that is proposed by Climax Molybdenum to offset unavoidable impacts to wetlands from construction of the proposed Property Discharge Water Treatment Plant (PDWTP) at the Climax Mine located near Leadville, Colorado. A Pre-Construction Notice (PCN) for the project was submitted in November 2011 which included information on the mitigation proposed ("Section 404 Nationwide Permit Pre-Construction Notice Property Discharge Water Treatment Plant Climax Molybdenum Summit County, Colorado" by Bikis Water Consultants, LLC). This Plan was prepared to supplement the information in the PCN, and to provide additional details on several aspects of the mitigation requested by the U.S. Army Corps of Engineers (Corps) during their review of the PCN. The areas of additional information are highlighted in this Plan.

2.0 PROJECT DESCRIPTION

The proposed project is the construction of a new water treatment plant at the Climax Mine. As described in detail in the November PCN report, Climax has been able to utilize the Mayflower Tailings Storage Facility (TSF) in its treatment process for second-stage metals removal prior to discharging water to Tenmile Creek. However, there are only several years of capacity left at this facility so that Climax will exhaust the existing tailing storage capacity in the Tenmile TSF and will need to begin using the Mayflower TSF for tailing deposition. This means that Climax will no longer be able to use the Mayflower TSF to provide treatment for second-stage metals removal. Therefore, a new facility will be needed. This facility (the PDWTP) must be completed and operational to coincide with the start of deposition of tailings in the Mayflower TSF expected in May 2014.

A detailed alternatives analysis was completed to locate and design the PDWTP. The site selected for the plant is along Tenmile Creek towards the northern end of the Climax property (see Figure 1). The original plan for the plant would have resulted in approximately 1.2 acres of impact to wetlands. The impact was reduced significantly to 0.282 acre of permanent impact (a reduction of more than 76 percent) by modifying the site design. This reduction in impacts increased the project cost by around $2 million. Additional details on the alternatives considered and measures used to avoid and minimize impacts to wetland are contained in the PCN.

3.0 UNAVOIDABLE IMPACTS

The proposed project will result in the following unavoidable impacts to wetlands:

- Permanent impact: 0.282 acre.
- Temporary impact: 0.108 acre.

Temporary impacts related to construction activity will be restored by use of construction matting, or by stripping and salvaging vegetation and topsoil for re-application following construction.

4.0 WETLAND MITIGATION PLAN

It is proposed to mitigate for the 0.282 acre of wetlands permanently impacted by the PDWTP by the creation of 0.46 acre of wetlands of a similar type on the project site (in-kind, like replacement). This amount of mitigation, which represents a mitigation ratio of 1.6:1 of created to impacted wetlands, was provided by the Corps based on an internal analysis of mitigation required, assuming the mitigation is constructed concurrently with the impacts so that there is minimal temporal loss of wetland functions. The wetlands would be created adjacent to existing wetlands on the site, and would be an expansion of the wetlands. Figure 2 shows the location of the mitigation site. The mitigation plan is shown on Figure 3 and a typical cross-section of the mitigation is shown on Figure 4.

The mitigation wetlands will be created by excavating a relatively flat area adjacent to the narrow part of Wetland 3 at the same elevation as the existing wetland (see the typical cross-section in Figure 4). The mitigation area will be over-excavated by approximately 0.3 feet to allow for placement of wetland soil salvaged from impacted wetlands in the mitigation area. The excavated soil and sub-soil material will be used for upland fill on the project site, or disposed of off-site in an upland area.

The mitigation area will be planted 2-foot, on-center with the wetland species listed on Figure 3. Willows and alders will be planted along the periphery of the area for screening and to enhance vegetation structure. All plant materials will be containerized nursery stock.

The side-slopes of the created wetland will be seeded with the transition area seed mix in Table 1. The upland seed mix in Table 2 will be used for upland areas disturbed by the work. Seeded

areas will be mulched with certified weed-free straw immediately after seeding, or alternatively, seeding will be done by hydroseeding/hydromulching, with seeding rates adjusted accordingly.

The mitigation will provide the same wetland functions as Wetland 3. The mitigation represents an enlargement of this wetland.

4.1 SUCCESS CRITERIA

The mitigation will be deemed successful when the following criteria are met at the site:

- Percent cover of wetland species of at least 80 percent. Wetland species will be determined using the "National List of Plant Species that Occur in Wetlands: Intermountain (Region 8)" (Reed et al 1988).
- At least two dominant species.
- At least 60 percent survival of planted trees and shrubs, with a canopy cover of at least 30 percent.

4.2 PROPOSED SCHEDULE

Construction on the PDWTP is expected to start in May 2012 to be able to have the plant operational in 2014, as needed. Wetlands would be impacted during the summer of 2012.

It is proposed to construct the wetland mitigation when the wetlands are impacted during summer of 2012. The following is the schedule for construction of the mitigation:

- Final plans and contractor selection - early spring 2012.
- Site protection and mobilization - early May 2012.
- Salvage of wetland soil from impacted wetlands - late May 2012.
- Site staking and completion of earthwork - late May 2012.
- Installation of wetland plants - June 2012.
- Preparation of as - built drawings - July 2012.
- Periodic observations - summer 2012.
- Field work for monitoring report - early September 2012.

- Submittal of first annual monitoring report - by November 30, 2012.

The above schedule assumes normal weather/snowpack conditions, and could be modified to reflect actual conditions, if needed.

4.3 MONITORING

The mitigation site will be monitored for five years, or until the site meets the success criteria. Monitoring will include the following:

- Measurements of species composition and percent plant cover in at least three vegetation plots (1 meter by 1 meter) and along two transects. The transects and plots will be located to be representative of the mitigation area. Preliminary locations are depicted on Figure 3.
- Observations of the condition of the planted trees and shrubs, and estimate of percent cover.
- Photographs will be taken from fixed photo points to document the success of the site. Photo points are shown on Figure 3.

4.4 REPORTING

Annual mitigation monitoring reports will be prepared and submitted to the USACE by November 30 of each year to document conditions at the site. The reports will include the data from the vegetation plots and transects, along with photographs. The report will also include a discussion of any deficiencies noted at the site and proposed remediation measures to correct the deficiencies. The report for the first year will include an as-built drawing of the wetland mitigation site.

4.5 SITE PROTECTION AND MANAGEMENT

The mitigation site is located on land owned by Climax. There is currently no public access to the site and there will not be public access in the future. Therefore, it is not proposed to protect the site with any deed restrictions or easement. The site will be constructed and maintained by Climax, who will be fully responsible for monitoring and success of the site.

4.6 REMEDIAL MEASURES

Deficiencies will be noted during the fieldwork for the annual monitoring. Possible remedial measures which could be implemented, if needed, include:

- Re-planting of herbaceous stock, trees, and shrubs. This could include use of different species.
- Weed control.
- Re-seeding of the transition area.
- Fencing of the site to avoid predation by wildlife.
- Re-grading of all or a portion of the site to improve water flow.

5.0 OTHER PERMITS

No other NWPs or Section 404 permits are required for the PDWTP. The PDWTP site is located within "affected land" as classified under Climax's existing Mine Reclamation Permit (Permit # M-77-493), issued by the Colorado Division of Reclamation, Mining and Safety (DRMS). As discussed previously, Climax holds an active Colorado Discharge Permit. Climax is also seeking a Summit County 1041 land use permit under the County's Areas and Activities of State Interest requirements.

6.0 WATER QUALITY PROTECTION

A sediment and erosion control plan will be implemented throughout construction of the plant and mitigation site. The plan will include Best Management Practices (BMPs) to protect water quality. The plan will be prepared to meet DRMS and Summit County standards.

P:\Project Files\162-11 Climax Molybdenum\2011\Task 01 Climax Mine\NWP for PDWTP\Addl Info\Prelim Mit Plan-Draft-2011-12-21.doc

Tables

Table 1. Transition Area Seed Mix[1]
For Mitigation Wetland Side-slopes
Climax Molybdenum

Common Name	Scientific Name	Percent Composition	Lbs PLS/AC[2]
Alpine bluegrass	*Poa alpina*	20	1.7
Idaho fescue	*Festuca idahoensis*	20	3.9
Mountain brome	*Bromus marginatus*	20	19.4
Slender wheatgrass	*Agropyron trachycaulum*	20	10.9
Tufted hairgrass	*Deschampsia caespitosa*	20	0.7
	Total:	**100%**	**36.6**

Notes:
Lbs PLS/AC = pounds of pure live seed per acre.

Footnotes:
1) Based on 200 seeds per square foot.
2) Rate based on drill seeding. Increase rate by 50 percent for broadcast seeding or hydroseeding.

Table 2. Upland Area Seed Mix
Climax Molybdenum

Species	Common Name	Desired Species Composition	Lbs PLS/Acre
Graminoids			
Bromus marginatus	Mountain brome	6%	1.7
Deschampsia caespitosa	Tufted hairgrass	12%	0.17
Festuca arizonica	Arizona fescue	10%	0.45
Elymus trachycaulus	Slender wheatgrass	10%	0.68
Festuca saximontana	Rocky Mountain fescue	10%	0.17
Phleum alpinum	Alpine timothy	12%	0.25
Poa alpina	Alpine bluegrass	5%	0.11
Trisetum spicatum	Spike trisetum	10%	0.09
	Graminoids Subtotal:	*75%*	*3.7*
Forbs			
Achillea millefolium	Common yarrow	*6%*	*0.05*
Linum lewisii	Blue flax	*6%*	*0.45*
Lupinus argenteus	Slivery lupine	1%	1.74
Penstemon strictus	Rocky Mountain penstemon	6%	0.27
Vicia americana	American vetch	2%	1.33
	Forbs Subtotal	*21%*	*3.83*
Shrubs			
Dasiphora fruticosa	Shrubby cinquefoil	2%	0.04
Ribes cereum	Wax currant	2%	0.16
	Shrubs Subtotal:	**4%**	**0.31**
	Combined Totals:	**100%**	**8.73**

Alternate Species	
Graminoids	
Agrostis humilis	Alpine bentgrass
Bromus ciliatus	Fringed brome
Elymus glaucus	Blue wild rye
Festuca brachyphylla	Alpine fescue
Festuca idahoensis	Idaho fescue
Festuca thurberi	Thurber fescue
Koeleria macrantha	Junegrass
Muhlebergia montana	Mountain muhly
Poa fendleriana	Muttongrass
Forbs	
Aquilegia coerulea	Colorado blue columbine
Chamerion angustfolium	Fireweed
Eriogonum umbellatum	Sulfur flower
Oxytropis sericea	Silky locoweed
Penstemon whipplianus	Whipple's penstemon
Senecio integerrimus	Lambstongue ragwort
Symphyotrichumspatulatum	Western mountain aster
Shrubs	
Artemisia tridentata	Big sagebrush
Ribes montigenum	Gooseberry currant
Sambucus racemosa	Red elderbrerry

Figures

P:\ Project Files \ 62-11 Climax Molybdenum \ Mapping \ Task01 Climax Mine \ ArcMap \ PDWTP \ Figure 1 Vicinity Map USGS.mxd

106°13'W 106°12'W 106°11'W 106°10'W 106°9'W 106°8'W 106°7'W

39°30'N 39°29'N 39°28'N 39°27'N 39°26'N 39°25'N 39°24'N

Wheeler Junction

Copper Mountain Resort

PDWTP Study Area

Climax Molybdenum Mine Operations

Map Sources:
Background - Shaded Relief Hillshade - ESRI, 2009,
USGS 24K Topographic Quadrangles - Copper Mountain, Vail Pass, Frisco and Breckenridge
Roads - ESRI, 2010

Map Legend

- Interstate
- Highway
- PDWTP Study Area

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0 1,500 3,000 6,000 Feet

1 inch = 3,000 feet

Designed by: DSS
Checked by: DBM
Date: 10/10/2011
Scale: 1:36,000

Climax Molybdenum Vicinity Map of PDWTP Study Area

Figure 1

106°9'50"W 106°9'40"W 106°9'30"W 106°9'20"W 106°9'10"W 106°9'W

39°27'10"N 39°27'N 39°26'50"N

Map Legend

- Culvert
- Cross Section
- Proposed Wetland Mitigation Area
- Project Area
- Wetland

Historic Highway

Tenmile Creek

Wetland 3
(1.123 acres)

Wetland 2
(0.097 acres)

A

A'

Proposed Wetland Mitigation Area
(≈0.46 acres)
See Figure 3 for details

Debris flow
spring 2011

Water directed
this way

Wetland 1
(0.687 acres)

Continues

91

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0 150 300 600 Feet

1 inch = 300 feet

Map Sources:
Aerial Photograph - USDA/FSA, Summer 2005
Wetlands - Bikis Water Consultants, LLC, June and July 2011

Designed by: DSS
Checked by: DBM
Date: 12/19/2011
Scale: 1:3,600

Climax Molybdenum
PDWTP - Wetland Mitigation Plan Location Map

Figure 2

P:\Project Files\162-11 Climax Molybdenum\Mapping\Task01 Climax Mine\ArcMap\PDWTP\Wetland Mitigation Plan\Figure 2 Wetland Mitigation Location Map.mxd

39°27'N

A

A'

Existing Wetland 3

Water Flow Path

P1

P2

P3

P4

P5

P6

P7

T1

T2

1

2

3

50 willows and alders planted for screening (exact planting locations may vary)

Access

Access

Historic Highway

Map Legend

- P1 — Monitoring Photo Point
- 1 — Vegetation Monitoring Plot
- Alder
- Willow
- T1 — Vegetation Monitoring Transect
- Water Flow Path
- Road
- Cross Section
- Created Wetland = 0.46 acres (ratio of 1.6 to 1)
- Existing Wetland (to be protected)

Notes:
1) BMPs for sediment and erosion control will be installed and maintained through construction per the mine's erosion control plan
2) Water control will be implemented, as needed, during construction.
3) Water rights requirements will be met by mine's water rights portfolio according to state water law.
4) Excavated soil and subsoil will be used on-site or disposed of in an upland area.
5) Site will be monitored for success according to the monitoring plan.

Wetland Construction:
- Wetland created by excavation to elevation of existing wetland.
- Site will be over excavated by 0.3 feet to allow for placement of soil salvaged from impacted wetland.
- Excavated soil material will be deposited in an upland area.
- Wetland planted with containerized nursery stock 2 feet o.c. with species in planting list.
- See typical cross-section in Figure 4.
- Transition area will be seeded (Table 1) and mulched.
- Willows and alders will be installed.

Wetland Planting List

Common Name	Scientific Name	Percent Composition	Number
Herbaceous[1]			
Blue-joint reedgrass	*Calamagrostis canadensis*	20	1,002
Elephant's head	*Pedicularis groenlandica*	5	250
Fowl mannagrass	*Glyceria striata*	10	501
Marsh marigold	*Caltha leptosepala*	15	752
Rocky mountain rush	*Juncus saximontanus*	5	250
Small-wing sedge	*Carex microptera*	10	501
Tufted hairgrass	*Deschampsia cespitosa*	20	1,002
Water sedge	*Carex aquatilis*	15	751
	Total:	**100%**	**5,009**
Trees and Shrubs[2]			
Alpine birch	*Betula nana*	34	17
Plane leaf willow	*Salix plantifolia*	33	17
Thin leaf alder	*Alnus tenuifolia*	33	16
	Total:	**100%**	**50**

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0 12.5 25 50 Feet

1 inch = 25 feet

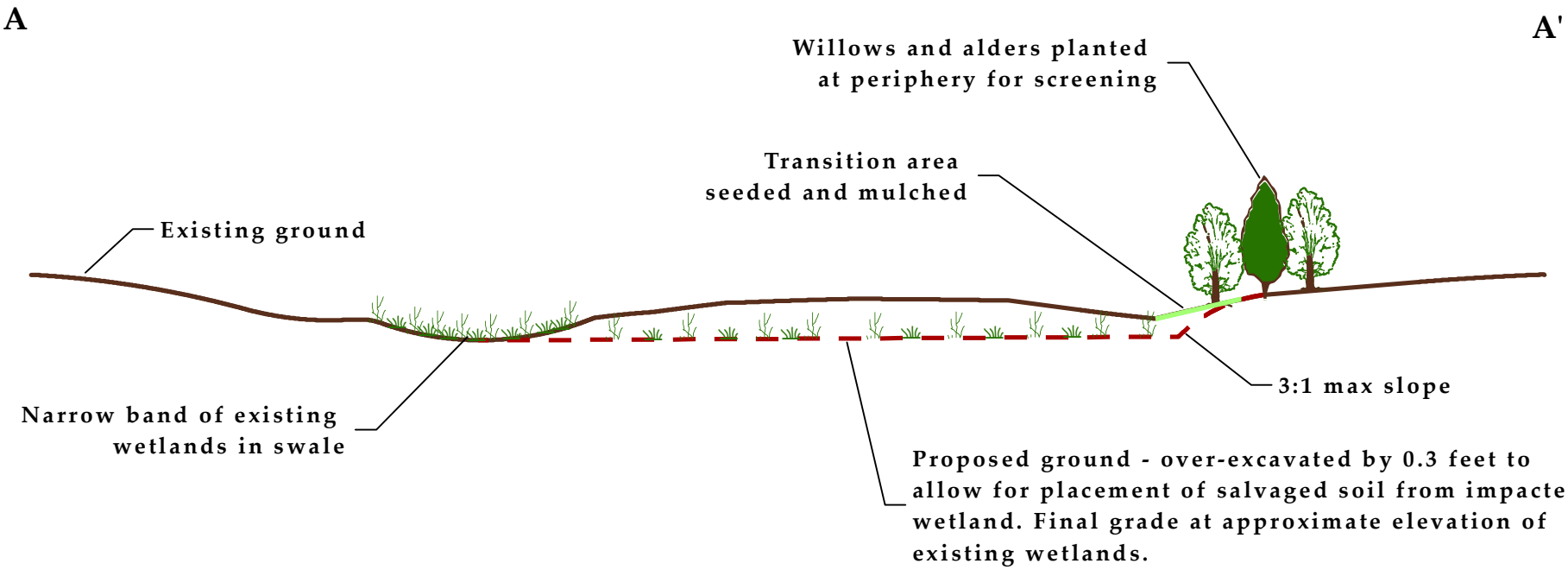
Map Sources:
Aerial Photograph - USDA/FSA, Summer 2005
Wetlands - Bikis Water Consultants, LLC, June and July 2011

Designed by: DSS
Checked by: DBM
Date: 12/19/2011
Scale: 1:300

Climax Molybdenum
PDWTP - Wetland Mitigation Plan
Plan View

Figure 3

P:\Project Files\162-11 Climax Molybdenum\Mapping\Task01 Climax Mine\ArcMap\PDWTP\Wetland Mitigation Plan\Figure 3 Wetland Mitigation Details.mxd



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0 30 60 120 Feet

1 inch = 60 feet

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Scale: 1:720

Climax Molybdenum
PDWTP - Wetland Mitigation Plan
Section A - A'

Figure 4

P:\Project Files\162-11 Climax Molybdenum\Mapping\Task01 Climax Mine\ArcMap\PDWTP\Wetland Mitigation Plan\Figure 4 Section A.mxd

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