

March 25, 2022

Submitted Via ePermitting and Email

Mr. Peter Hays  
Division of Reclamation Mining and Safety  
1313 Sherman St., Rm. 215  
Denver, CO 80203

**RE: Climax Molybdenum Company, Henderson Mill, Permit No. M-1977-342, Technical Revision No. 35, Water Treatment Plant**

Dear Mr. Hays:

Climax Molybdenum Company (CMC) is submitting this request for a Technical Revision to the Henderson Reclamation Permit for the addition of a Water Treatment Plant (WTP) at the Henderson Mill. The need for, and development of, a water treatment plant at the mill has been a multi-year process. Now with the design substantially complete and the project scheduled for construction, Henderson is now ready to submit this formal request as Technical Revision 35 (TR-35) to the Henderson Mine and Mill Reclamation Permit No. M-1977-342.

The attached report will describe in more detail the following aspects of the project:

- Project Introduction
- Project Description
  - Location and layout
  - Treatment process
  - Reagents
  - Ancillary Facilities
  - Project schedule
  - Construction QA/QC
- Summary of other agency permits and authorizations
- Design Drawings

If you have any questions regarding this submittal, please contact me at (720) 942-3631.

Sincerely,



Geoff Niggeler  
Chief Environmental Engineer  
Climax Molybdenum Company  
Henderson Operations

Enclosures:

1. Project Summary Report

cc (via email)  
M. Hamarat, Climax

# **Henderson Operations Reclamation Permit Number 1977-342 Technical Revision TR-35**

## **Henderson Mill Water Treatment Plant (WTP)**

*Prepared on behalf of:*

**CLIMAX MOLYBDENUM COMPANY**

*Henderson Operations*

*19302 County Road 3*

*Parshall, CO 80468*

*Submitted to:*

**COLORADO DIVISION OF RECLAMATION, MINING & SAFETY**

*1313 Sherman Street, Room 215*

*Denver, CO 80203*

March 25<sup>th</sup>, 2022

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530-DC00-PFD-102	Process Flow Diagram Sheet 2

## 1. INTRODUCTION

Climax Molybdenum Company owns and operates the Henderson Mill, located in Grand County, Colorado approximately 22 miles south of Parshall, Colorado northeast of Ute Pass on the western side of the Continental Divide in the upper Williams Fork River (WFR) valley of the upper Colorado River basin. The mill receives ore from the underground Henderson Mine operation via conveyor through a 10 mile-long conveyance tunnel and 5 mile-long overland conveyor. Molybdenite concentrate is extracted from the ore at the mill facilities by crushing and flotation. The mill complex area facilities include the portal, overland conveyor, ore piles, the primary mill building and related facilities and infrastructure, and a Tailing Storage Facility (TSF) located northwest of the mill complex. The Henderson Mill Water Treatment Plant (WTP) project will be constructed within the mill complex, northeast of the mill building and within the currently permitted affected land boundary.

Operations at the Henderson Mill began in 1976, and the existing permit, Mining and Reclamation Permit M-1977-342, 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 most recently amended in 2020 with the approval of AM-07. In addition, 34 previous Technical Revisions (TR) to the Permit have been approved by the Colorado Division of Reclamation, Mining, and Safety (DRMS) or withdrawn or superseded by other technical revisions or amendments.

As described in the current Environmental Protection Plan (EPP), submitted and approved as TR-34, the Mill WTP 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 mill operates as a zero-discharge facility when in full production. Water used in the mill is conveyed to the TSF in the tailings slurry and then is recycled back to the mill via the East Branch Reservoir (EBR) for reuse. However, there are certain scenarios that could result in surplus water being stored within the TSF and/or EBR which, over certain levels, could result in reduced stability. Potential scenarios include:

- The occurrence of an extreme climatic event out of Henderson's control.
- A potential decrease in production causing a related decrease in the consumptive use of water entrained in the tailings, resulting ultimately in a net positive water balance for the site.
- Upon closure of the mill, where the long-term treatment of collected, impacted water (e.g., water that seeps from the TSF, or "seepage water") is anticipated.

The proposed WTP will provide additional safety measures for the TSF and EBR as well as operational flexibility by enabling surplus water to be treated and discharged.

The information being provided with this TR represent General Arrangement drawings to allow the Division's review under Rule 7.3. Henderson is working with the State of Colorado Department of Public Health and Environment (CDPHE) to obtain a renewal of the existing discharge permit that will allow off-site discharge of treated effluent from the WTP to the Williams Fork River (WFR). The final permit renewal is expected to be issued in late 2022 or early 2023 with construction beginning after receipt of the final permit renewal (2022-2023). The WTP is expected to begin operations in 2023 or 2024.

## 2. PROJECT DESCRIPTION

The project scope includes the construction and operation of a 600 gpm WTP at the Henderson Mill. The proposed WTP will be located northeast of the mill building in a previously disturbed area within the Mill Complex and current Affected Land Boundary. **Figure 1** presents an overall site plan for the Henderson Mill facility, with an inset showing the proposed location for the WTP, and the location of the outfall at the Williams Fork River. The WTP will treat surplus process water from the mill for discharge to the WFR. The main objectives for the WTP are to facilitate flexible site-wide water management under varying climatic conditions, maintain operational flexibility of the mill, increase the efficient use and re-use of water and achieve and maintain compliance with the effluent limits to be established under the Colorado Discharge Permit System (CDPS) administered by the Water Quality Control Division (WQCD).

The mill recirculates, stores, recycles and reuses process water between the TSF, EBR, and the mill. Process water from the mill is conveyed to the TSF with the tailing slurry for storage. Process water is then recycled from the TSF to the mill by pumping water from the TSF decant pond into the EBR and subsequently to the mill for use. Although water treatment has always been part of the long-term life-of-mine plan, the mill facility has operated as a zero-discharge facility since Henderson began operations in 1976; meaning that all water within the system has been recirculated for use within the milling circuit.

The WTP treatment process will consist of a lime-based, single-stage high-density sludge (HDS) process capable of treating surplus water at a design flow rate of 600 gpm, which is 1.3 cfs or 0.86 MGD, year-round. The HDS process recirculates sludge to increase the neutralization potential of the added lime, improve coagulation and settling, and reduce reagent use. As the pH is raised to alkaline conditions, metals are precipitated. The resulting precipitate, or sludge, is thickened and removed from the HDS effluent using a clarifier. Ultimately, waste sludge will be conveyed to the TSF for disposal using existing pipelines. Clarifier overflow, or effluent, is filtered and undergoes pH neutralization using carbon dioxide. Finally, an existing pipeline will convey treated water from the WTP to the discharge location on the WFR at the existing Williams Fork pump station.

The Henderson Mill holds an active CDPS permit which allows for the discharge of process water under certain conditions, although, as stated above, the Henderson Mill has operated as a zero-discharge facility. This current permit was issued in 2007 and has been administratively extended. A CDPS permit renewal application for the Henderson Mill was submitted to the WQCD on April 14, 2020, with modifications to encompass the WTP project. The WQCD will process the application and issue a permit establishing discharge limits, based on the applicable water quality standards in the receiving stream to protect its classified uses.

The construction of the WTP is the subject of this Technical Revision. Key project elements are summarized below, and additional detail is provided in subsequent sections:

- The WTP will be located northeast of the mill building in a previously disturbed area within the Mill Complex;
- Plant capacity is rated at 600 gpm;
- The plant is designed as a High Density Sludge (HDS) process and includes polymer-enhanced flocculation, clarification, and gravity filtration;
- Sludge will be re-circulated to increase the neutralization potential of the added lime and improve coagulation and settling;
- Carbon dioxide will be dissolved in the water to neutralize the pH prior to discharge;
- Chemicals to be used for water treatment will include hydrated lime, flocculent polymer, and carbon dioxide;
- The WTP has been designed with sumps to catch overflows and spills. These sumps will return captured water to treatment;
- The WTP building will be a pre-engineered steel building with concrete floor and foundation;

- The WTP building will house the HDS processes and clarifier and will be approximately 105 feet wide and 150 feet long;
- Final treated water will gravity flow from the WTP to the discharge point at the Williams Fork Pump Station (Outfall 007) through the existing Williams Fork Pipeline;
- Feed water to the WTP will be supplied from the mill process water circuit;
- The plant will be equipped to divert and re-process water that does not meet discharge specifications;
- An emergency generator will be installed that will keep key process equipment operating during power outages; and
- The general site layout has been designed so that surface flow surrounding the site will be maintained within the process water system by routing flow to the TSF through the Bear Paw pipeline.

Current design drawings for the WTP are presented in **Appendix A** and referenced throughout the following subsections.

## 2.1 Plant Location and Site Layout

The proposed WTP will be constructed at approximate coordinates 39°50'52.17"N, 106° 4'39.32"W, northeast of the mill building in a previously disturbed area within the Mill Complex and current Affected Land Boundary. The WTP Project Area within the overall context of Henderson Mill facility is presented on **Figure 1**. The detailed site layout drawing for the area immediately around the proposed WTP are provided in drawings 530-DD10-PLN-601 and 530-DD10-PLN-602 in **Appendix A**. Drawings in **Appendix A** have been developed by Wood, the design engineer for the project, and generally represent a "Issue for Construction" level of design. Certain details depicted on the drawings, such as internal piping layouts, are subject to change as the project continues into construction, however, very little is anticipated to change relative to major equipment, overall layout, and building configurations.

The detailed general arrangement drawing and section for the interior of the WTP are provided as drawings 530-DE10-GAD-101, 530-DE10-GAD-102 and 530-DD10-PLN-401 in **Appendix A**.

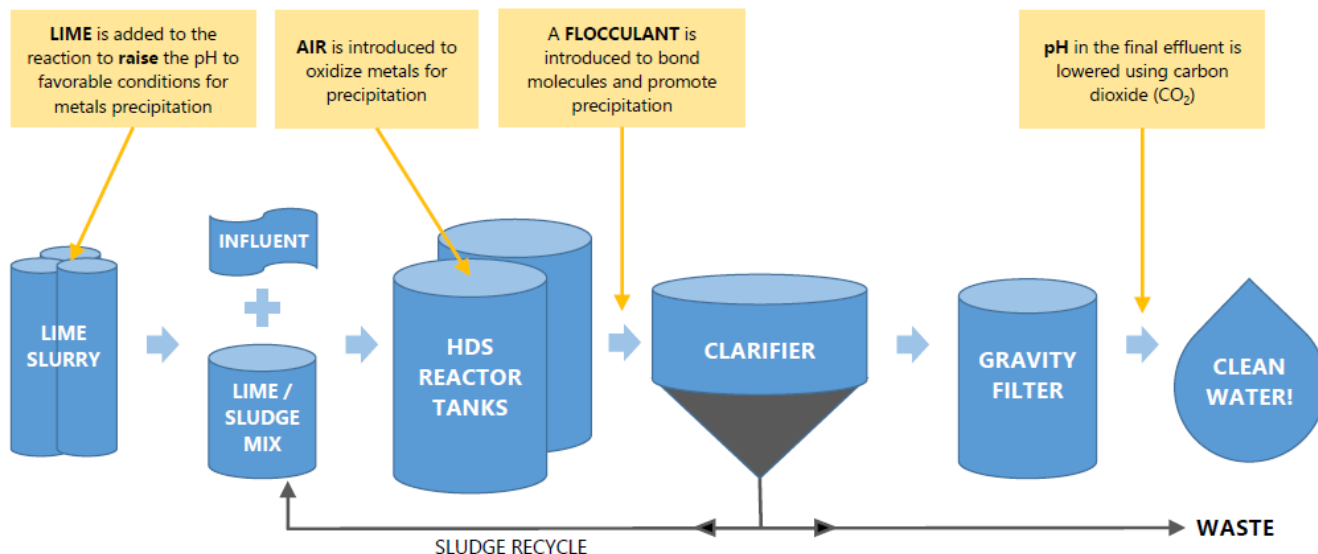
The WTP will be a pre-engineered steel building with concrete floor and foundation approximately 105 ft by 150 ft in size with an eave height of approximately 45 ft. Exterior to the steel building the lime silo and CO<sub>2</sub> storage tank will be located on the south side of the WTP and the emergency generator and the transformer will be located on the west side of the WTP. The interior of the WTP comprises a large central area where the HDS reactor tanks, clarifier, gravity filters, lime slurry tank, spent backwash tank, effluent tank, sludge storage tank, flocculant and polymer system, and associated pumps and equipment will be located. Located on the outer perimeter wall of the WTP will be the break room, control room, restrooms, lab, and maintenance shop area (on the east wall), flocculant storage area (on the north wall), and electrical room, and communication room, with a small extension for compressors (on the west wall). The WTP has been designed with sumps to catch overflows and spills. These sumps will return captured water to the treatment process. Water for industrial uses and potable treatment supply will be provided by the raw water pipeline, which ties into the mill. A small reverse osmosis potable water treatment system capable of treating 2.8 gallons per minute on average and will be equipped with a 1,000-gallon storage tank.

The area immediately surrounding the WTP will be asphalt paved, with a designated parking area located on the east side of the WTP building. The improved area will be graded to route stormwater flow to perimeter stormwater collection swales. These stormwater drainage swales direct drainage to existing drainage swales which route stormwater flow to the Bear Paw Drainage Pipeline inlet which drains to the TSF, maintaining stormwater within the process water system. Drainage from the roof of the building will also be captured in a gutter system and directed to the Bear Paw Drainage Pipeline Inlet in a buried pipeline. The existing Bear Paw pipeline captures runoff from other areas of the mill complex as well and conveys these flows to the TSF where it is managed as part of the process water system. Stormwater will flow to the TSF and be recirculated through the mill process water system.

The WTP building pad will be built up slightly above the existing ground surface and will slope down to tie into existing grade at a 3H:1V slope, with a small area on the east side of the WTP sloping down at 2.5H:1V due to space constraints in that area related to the proximity of the North Mill Access Road. The septic tank and leach field will be located to the east and north of the WTP, respectively. The leach field area lies at an elevation approximately 10 ft below the proposed elevation of the WTP.

## 2.2 WTP Primary Treatment Processes

The WTP relies on a single-stage, lime-based HDS process to remove constituents of concern, primarily metals, from the influent water. A simplified process diagram is included below to visually represent this process.



**Diagram 1. Water Treatment Plant Process Diagram**

Feedwater from the mill will be conveyed to the WTP through the influent pipeline.

The major process components of the WTP include the following:

- Lime/Sludge Mix Tank – lime is mixed with recycled solids (sludge) from the clarifier
- HDS Reactors – two reactors are constructed to treat the water in series. In these reactors, the slurry from the lime/sludge mix tanks is mixed with the influent water, air is introduced, and elevated pH and the presence of oxygen causes targeted constituents to oxidize and precipitate. Following reaction, polymer is added to promote flocculation prior to flowing into the clarifier.
- Clarifier – flocculated particles in the reacted water settle and the clarified overflow is routed to the gravity filter while the heavy underflow of flocculated particles is recycled or pumped to the TSF for disposal.
- Gravity Filtration – remaining solids are removed in multi-media filters and filtrate is routed to the effluent tank for neutralization.
- Effluent tank & Neutralization – CO<sub>2</sub> is dissolved in the water to neutralize the pH prior to discharge.

The HDS process utilized by the plant re-circulates sludge to increase the neutralization potential of the added lime and improve coagulation and settling. Lime will be combined with recycled sludge from the clarifier in the lime/sludge mix tank. Influent water from the mill and lime/sludge slurry will flow into Reactor Tank #1 and then

to Reactor Tank #2. The piping will be arranged to allow either reactor to be used alone to permit maintenance without taking the plant offline. Each reactor will be provided with an agitator. Lime will not be supplied directly to the reactors, but via the lime / sludge 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 between 10 and 11 in the reactors to improve metals removal. Air will be introduced into the reactor tanks via coarse aeration to oxidize ferrous iron and manganese. The reactor tank effluent will be dosed with polymer and then flow to the clarifier where the resulting precipitate will be thickened. The clarifier is an elevated steel tank which will be situated within the WTP building to allow greater temperature control and protection from weather elements to reduce settling variability. A clarifier rake maintains solids fluidity and moves solids to the center cone as underflow. Clarifier underflow will be recycled to the lime/sludge mix tank using positive displacement sludge recycle pumps. The portion of the sludge that is not recycled will be routed for disposal in the TSF. This process includes pumping sludge to the sludge storage tank, which is equipped with a mixer to maintain solids in suspension until the sludge is pumped to the Bear Paw Pipeline (which flows to the TSF). Following sludge pumping events, water flushing procedures will be followed to reduce the potential for solids to settle and accumulate in plant or sludge disposal pipelines.

The clarifier overflow will flow to gravity multi-media filters. An underdrain system will collect the filtered water. A portion of the water will be used for backwashing the filters and the balance will flow to the effluent tank. Each of the multi-media 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 wastewater will be pumped back to the Spent Backwash Tank and then to the reactor tanks for treatment.

Neutralization is conducted through dissolving CO<sub>2</sub> with utility water to create carbonic acid and injecting a slipstream of this carbonic acid into the Effluent Tank to neutralize the WTP effluent prior to discharge. The final plant effluent will be discharged to the WFR through an existing pipeline to the Williams Fork Pump Station.

### **2.2.1 Solids Handling and Sludge Disposal**

Sludge material not recycled to the lime/sludge mix tank will be stored in the sludge storage tank. Periodically, this sludge material will be pumped to the Bear Paw Pipeline to be routed to the TSF for disposal. Between pumping intervals, solids in the sludge storage tank will be maintained in suspension using a tank mixer. Following pumping of sludge, water will be pumped through the pipelines to reduce the potential for solids to settle and accumulate in the pipeline. Sludge disposal is anticipated to be conducted at an average rate of approximately 1,000 gallons per day (100 pounds of dry sludge per day).

The sludge is comprised of lime and metal precipitate residuals. The TSF is designed to contain mill tailing which contain the same metals. The supernatant pond on the TSF is included in the process water system, so any water delivered with the sludge or contacting the sludge will be recycled through the mill process water system and routed back to the WTP for treatment prior to discharge. Due to the small quantity of WTP sludge being disposed at the TSF when compared to the overall size of the TSF, the metal loading attributed to the sludge disposal is insignificant (the volume of daily sludge production is anticipated to be approximately 0.00025% of the total mass of tailings deposited in the TSF daily). The TSF has been designed, and is being operated, with effective engineering controls and redundancies, including seep water collection and return, a groundwater interceptor system, and regular internal and external monitoring and inspections. The TSF and associated seep water collection facilities are designated as EPFs in the facility EPP.

### **2.2.2 Process Control Strategy**

The WTP has been designed with the level of control and redundancy needed to achieve compliance with CDPS permit requirements and environmental protection of the WFR. 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 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.



## **2.3 Reagents**

Water treatment chemicals or reagents are identified in the EPP. Reagents used in the WTP process include hydrated lime for metals precipitation, polymer flocculant to facilitate the settling of precipitated solids, and CO<sub>2</sub> to lower the pH of the treated water to circumneutral prior to discharge. General information for these chemicals including safety considerations, storage and handling, effectiveness and monitoring activities is provided in the EPP. Additional specific information relative to the storage and use of these chemicals at the WTP is provided below.

### **2.3.1 Unloading Stations**

Access to reagent truck unloading areas at the WTP utilizes the same truck traffic routes as other bulk deliveries to the Henderson Mill and, as such, do not create any additional risk for chemical release. Further, the WTP area is contained and drains to the Bear Paw Drainage Pipeline inlet. The Bear Paw pipeline conveys flows to the TSF.

### **2.3.2 Lime System**

Hydrated lime is used to raise the pH of the water being treated to alkaline conditions, and metals are subsequently oxidized and precipitated. Contact can cause irritation to eyes, skin, respiratory system, and gastrointestinal tract. Hydrated lime does not react as violently with water as quicklime but may still release heat upon mixing. Contact with eyes can cause severe irritation or burning, including permanent damage.

In the presence of acidic conditions such as acid rock drainage or acid mine drainage, hydrated lime reacts as an acid neutralizer and buffer. It can be used to raise the pH of acidic waters. Should hydrated lime be delivered directly into a non-process water or a non-acidic water environment, it would cause short-term impacts to aquatic communities by raising the system pH. Direct long-term impacts would be negligible to non-existent since calcium hydroxide would neutralize in the natural system and does not bio-accumulate.

The lime system includes the lime silo, lime slurry tank, lime feed pumps, and ancillary support equipment. The lime silo is approximately 45-ft tall and sized to hold approximately 50 tons of lime. Hydrated lime is transferred pneumatically to the silo from bulk tanker trucks and the silo will be equipped with a baghouse system to capture particulate matter. The lime silo will be located on the south side of the WTP building, while the 250 gallon lime slurry tank and feed pumps will be within the WTP building, with an enclosed screw conveyor to transfer hydrated lime from the silo to the slurry tank. Within the lime slurry tank, powder lime is combined with raw/fresh water to obtain the proper slurry concentration for water treatment. Lime feed pumps then pump the lime slurry to the lime/sludge mix tank for use in the treatment process. Any lime slurry spill will be contained within secondary containment/sump system of the plant and returned to the plant feed or process tanks.

### **2.3.3 Polymer Flocculent**

The polymer flocculent (DAF-10 or equivalent) will be used to promote precipitation of metals and improve settling of sludge in the clarifier. Dry polymer will be mixed with water in the package polymer make-up system in a 100 gallon mix tank, aged based on polymer product requirements, and delivered to the 140 gallon polymer dosing tank where it will then be added to the treatment system. The resulting precipitate or sludge is thickened and removed from the treatment system using a clarifier. Ultimately, waste sludge will be conveyed to the TSF for disposal. The product does not contain any hazardous components and is non-reactive, non-flammable, and a slight human health hazard. Eye protection and gloves should be worn when in contact with the product. Avoid inhalation of vapors or mist. Product produces extremely slippery surfaces when wet. In the environment, DAF-10 is stable and non-hazardous.

### **2.3.4 Carbon Dioxide**

Carbon dioxide (CO<sub>2</sub>) will be used for effluent neutralization in the Mill WTP. It is an extremely cold liquid and gas under pressure and may cause frostbite upon skin contact. Eye protection and gloves should be worn when in contact with the product or product containers. Ingestion is not considered a potential route of exposure. Store in a cool, well-ventilated place. In the environment, released carbon dioxide will disperse into the atmosphere. Bulk

liquid CO<sub>2</sub> will be stored in a 775 gallon (4,929 pounds) Microbulk Storage Tank prior to mixing with water for use in effluent neutralization.

## **2.4 Ancillary Facilities**

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

- Pipelines
- Water and Sanitary Sewer Systems
- Power and Utilities
- Roads and Access
- Point of Discharge

### **2.4.1 Pipelines**

The primary pipelines to be constructed as part of the WTP project are depicted on the Site Civil & Underground Piping Plan, drawing 530-DD10-PLN-601 in Appendix A and include the following:

- 1) Influent pipeline
- 2) Raw/fresh water pipeline
- 3) Off-spec water / sludge pipeline
- 4) Treated water / effluent pipeline

The influent pipeline and the raw/fresh water pipelines will be constructed in a common utility corridor trench from the mill area (also to be used for electrical and fiber optic). The pipelines will be approximately 400 ft in length, with the influent pipeline constructed of 6" high density polyethylene (HDPE) and the raw/fresh water 3" HDPE. The tie-ins at the mill will be above ground, however the pipelines will be buried over the majority of the length to the WTP.

The off-spec water / sludge pipeline will convey off-specification water (not meeting discharge criteria) or waste sludge through a buried 8" HDPE pipeline approximately 490 ft in length between the WTP and a tie-in point with the existing Bear Paw Pipeline northwest of the WTP. The Bear Paw Pipeline is an existing buried pipeline used to convey collected waters to the TSF, including sump water from the Mobile equipment shop, scrubber water from the Headhouse / conveyor system, and North Mill site stormwater. The Bear Paw pipeline is 18" HDPE for the first approximately 270 ft, and thereafter is an 18" corrugated metal pipe slip-lined with a 16" HDPE pipe.

The treated water / effluent pipeline will convey treated water through a buried 8" HDPE pipeline approximately 1,072 ft in length between the WTP and a tie-in point with the existing Williams Fork Pipeline just east of the Mill Access Road. The proposed pipeline will be routed within an existing road for the majority of its alignment. The effluent pipeline will connect to the existing Williams Fork Pipeline in a concrete valve vault. The existing Williams Fork Pipeline is a 24" steel pipeline which will convey the treated water to the discharge point at the Williams Fork Pump Station.

A more detailed description of the existing Williams Fork Pump Station and its use in conjunction with the WTP is provided in Section 2.4.5.

The roof drain pipeline, discussed in Section 2.1, which will convey stormwater through a buried 8" HDPE pipe to the existing Bear Paw Drainage Pipeline is also shown on the Site Civil & Underground Piping Plan included in Appendix A.

### **2.4.2 Water and Sanitary Sewer**

Water pulled directly from the mill raw/fresh water line will be used to feed the lime slurry tank, polymer make-up tank, and also used for gland water supply.

Raw/fresh water will also be fed to the potable water system, treated and used in the breakroom, lavatories, and laboratory. Potable water will also be used in the tepid water system for the building safety shower/eyewash

stations. The potable water system will consist of a small reverse osmosis potable water treatment system capable of treating approximately 2.8 gallons per minute on average and will be equipped with a 1,000-gallon storage tank.

Utility water, which consists of treated water from the WTP effluent tank, will be used for a variety of purposes including push water for the polymer system, carrier water for the CO<sub>2</sub> system, dilution/flush water for the sludge system, and utility hose stations (cleaning).

Sanitary water will be directed to a septic tank and leach field. A leach field location to the north of the WTP is identified on drawing 530-DD10-PLN-602, included in Appendix A, however this location is subject to change based on additional site investigation activities during construction but not anticipated to be significantly modified as preliminary geotechnical investigations of the area have been used to inform the current design. Laboratory wastewater streams will be returned to the head of the process and will not be discharged to the septic system. Lab tests associated with wastewater treatment plants are for process control and are generally taken at each location where a change in the process occurs. Tests associated with process control are expected to include, but are not limited to, pH, oxidation reduction potential, total suspended solids, sludge density, temperature and soluble manganese.

#### **2.4.3 Power and Utilities**

Electricity for the WTP will be provided utilizing a tie-in to the electrical supply at the existing mill switchgear via medium voltage (MV) 15 kV Class power cables routed in an underground electrical duct to a new MV unit substation near the WTP. A site-rated, diesel-driven, arctic-duty, enclosed generator will be provided to supply critical emergency power to the plant during periods of power loss. Diesel fuel storage for this generator will be contained within a double-walled sub-base tank. Critical process equipment and building lighting, heating, ventilation, and communications systems can be maintained during a power loss.

Natural gas, for heating purposes, will be provided to the WTP site by tying into the existing 1" gas line supplying the mill building to the east of the WTP.

#### **2.4.4 Roads and Access**

The WTP will be located northeast of the mill along an existing access road. The main access to the plant will be provided from the existing entrance off the North Mill Access Road to the disturbed area where the WTP will be constructed. The gravel parking area around the WTP will be improved by overlaying with asphalt. A security gate will be installed between the North Mill Access Road and the WTP to control access.

#### **2.4.5 Point of Discharge**

The WTP treated effluent will gravity flow through the existing Williams Fork Pipeline and discharge to the WFR at an existing outlet structure. The Williams Fork Pump Station was originally constructed and still utilized to withdraw water from the WFR and pump water to the mill for use. The infrastructure at the pump station includes an inlet structure on the WFR upstream of the pump station and an outlet headwall downstream of the station. Water enters the pump station through a buried box culvert from the inlet structure and this box culvert passes through the pump station and continues to an existing headwall discharge structure on the river to serve as a bypass system. The pump station system will be modified to allow treated effluent from the WTP to be conveyed through the existing pipeline to the existing Williams Fork Pump Station and to pass through the structure and discharge to the river through the existing bypass box culvert outlet.

### **2.5 Project Schedule**

Engineering and design of the WTP is substantially complete and is considered "Issue for Construction". As mentioned above, Henderson expects to have permitting for the project completed in late 2022 or early 2023 with construction beginning after receipt of final permits (2023-2024). The WTP is expected to begin operations in 2024 or 2025.

## **2.6 Construction Quality Control/Quality Assurance**

The project will be divided into distinct work packages, which will each have detailed construction drawing and technical specification packages. The technical specifications will contain equipment and material specifications, project execution requirements, and quality control requirements, which will be the responsibility of the performance contractors selected to construct the facility. Henderson or the general contractor 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 Henderson or it's designated Construction Manager, who will have overall responsibility for ensuring the facilities are constructed in accordance with the plans and specifications.

Following completion of construction, Henderson will provide a certified verification by a registered Professional Engineer that the facility was constructed in accordance with the approved design plan, for DRMS acceptance.

### **3. OTHER AGENCY PERMITS AND AUTHORIZATIONS**

The state and local permits and approvals that will be required from agencies other than the DRMS specifically for the WTP are described below. No federal permits or approvals have been identified as required for the WTP.

#### **3.1 Air Permit**

Henderson holds an active Air Permit (#02GR0546.CP5) issued by the Air Pollution Control Division (APCD) of the Colorado Department of Public Health and Environment (CDPHE). The lime silo and emergency generators to be located at the WTP represent the only identified sources associated with this project that may have regulated air emissions. The lime silo emissions are anticipated to be permit exempt. As detailed specifications for the emergency generator 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.

#### **3.2 Grand County Activity of State Interest**

The WTP falls under the classification of Municipal and Industrial Water Projects under the Grand County Administrative Regulations for Areas and Activities Designated as Matters of State Interest. Henderson is in the process of obtaining what is known as a 1041 permit through the County Planning Department.

#### **3.3 Grand County Building Permits**

The Building Permit will be submitted to Grand County following substantial completion of the design. The Building Permit application will include the following information:

- Building Permit application form
- General drawings including: Cover sheet, plot/site plan (showing property lines, setbacks, structures, topography, driveway, water features, sanitation features)
- Building plans (foundation plan, floor plans, roof plans, exterior elevations, details, building sections)
- Structural plans (foundation Plan, foundation details, floor framing plans, roof framing plan, structural details)
- Additional information which may be requested i.e., ceiling plans, lighting and power plans, mechanical equipment plans, landscaping plans, interior finish details etc.
- The building permit also requires the following:
  - Proof of Legal Sanitation - OWTS Application (Septic permit)
  - Proof of Legal Drinking Water
  - Proof of Fire Impact Fee
- Contractor Verification Form or Acknowledgement of Contractor Insurance

#### **3.4 Grand County Septic Permit**

An application for an onsite septic system permit will be submitted to Grand County for the WTP 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, and the slope of the proposed leach field.

#### **3.5 Potable Water Treatment System**

The WTP design concept includes providing potable water to the WTP through treatment of raw/fresh water supplied from the mill in a dedicated vendor-supplied package drinking water treatment system which includes Reverse Osmosis (RO) followed by ultraviolet (UV) disinfection. This system will provide potable water at an approximate average rate of 2.8 gpm and will include a 1,000 gallon storage tank and small bladder tank for

operating safety showers, eye wash station, sinks, and washrooms under the calculated instantaneous maximum potable water demand. Henderson currently operates a Public Water System (PWSID# CO-0225116) for the mill. The package system for the WTP will be a separate system serving less than 25 individuals daily and is therefore exempt from the design review process under the Colorado Drinking Water Regulations administered by the WQCD of the CDPHE.

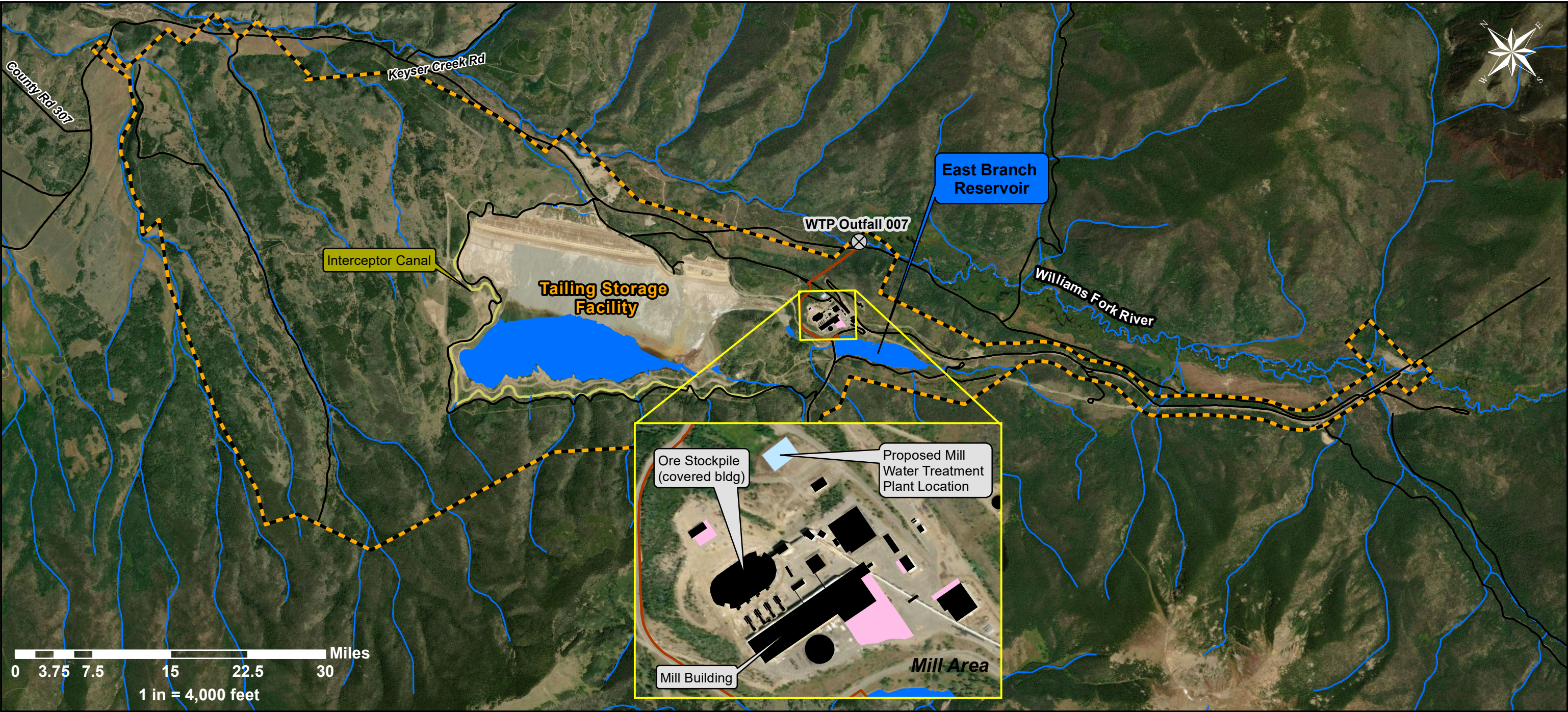
### **3.6 Construction Storm Water Permit**

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 WQCD of the CDPHE. A Construction Stormwater General Permit (COR400000) is required for projects disturbing greater than 1 acre. Although the construction of the WTP will likely disturb more than 1 acre, the primary plant construction area is within the boundaries of the Henderson Mill process water system, within which stormwater is captured and managed as process water and therefore regulated under the Site's CDPS discharge permit. This process water system includes drainage areas which contribute or flow to the TSF and the East Branch Reservoir, including the mill area and the location of the WTP. Construction activities outside of process water system boundaries are limited to the tie into the existing Williams Fork Pipeline and minor modifications within the Williams Fork Pumphouse and are not expected to exceed 1 acre. Because construction of the WTP will not create stormwater outfalls outside of this area a Construction Stormwater General Permit is not anticipated, although Henderson will consult with the WQCD, as appropriate.

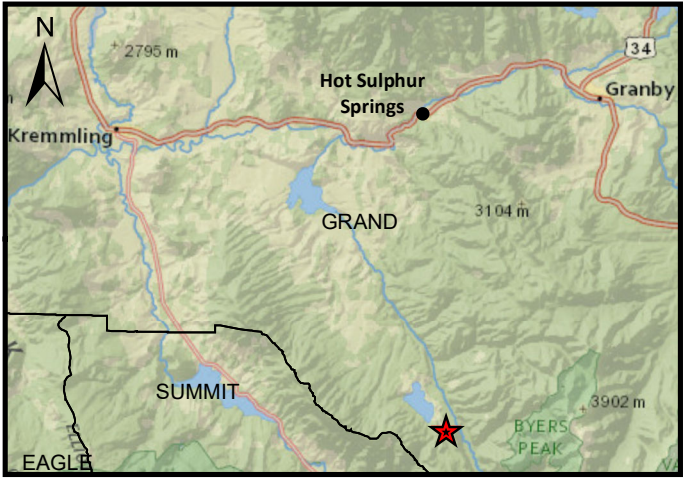
## FIGURES

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Location Map



Legend

- |                          |                 |
|--------------------------|-----------------|
| Proposed Structures      | Discharge Point |
| Property Boundary        | Parking Lot     |
| Buildings and Structures | Roads           |
| Williams Fork Pipeline   | Water Bodies    |
| Interceptor Canal        |                 |

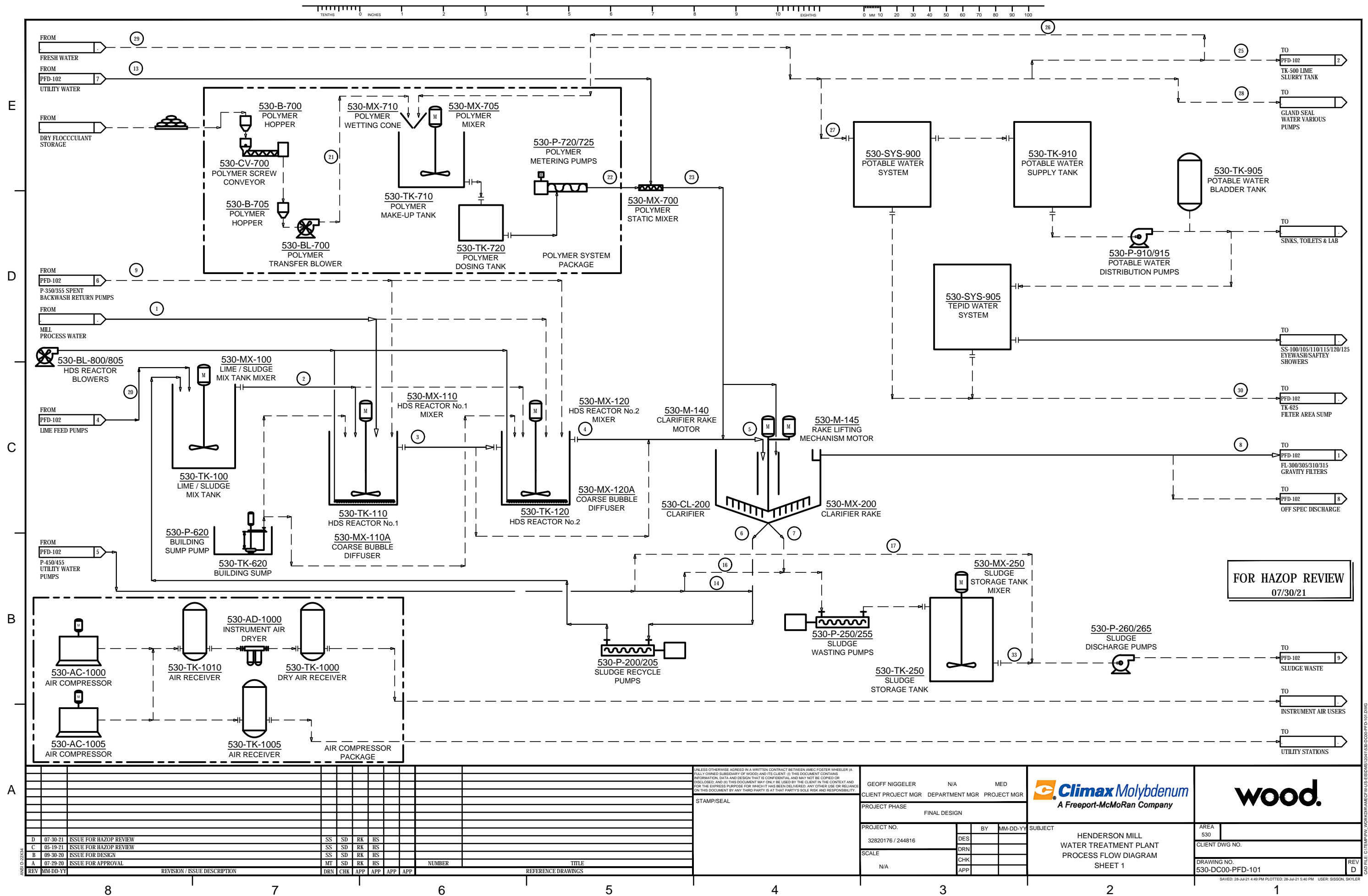
Design presented is conceptual and subject to optimization during final design process

TITLE: <b>Henderson Mill Site Plan and WTP Location</b>			
LOCATION: <b>Henderson Operations Grand County, Colorado DRMS Permit No. 1977-342</b>			
	APPROVED	DL	FIGURE <b>1</b>
	DRAFTED	CC	
	PROJECT#	117-8126010	
	DATE	March 2022	



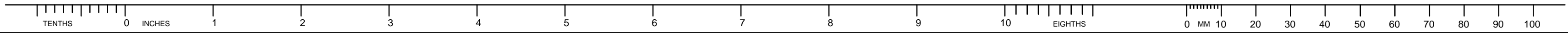
## **APPENDIX A: WTP Design Drawings**

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LEGEND

- EXISTING NATURAL GAS LINE
- EXISTING WATER LINE
- EXISTING OVERHEAD POWER LINE
- EXISTING PIPELINES
- EXISTING FENCE
- EXISTING POWER POLE
- EXISTING SITE STRUCTURES & WATER TREATMENT PLANT
- EXISTING ROADS
- WATER TREATMENT PLANT STRUCTURES
- NEW PIPELINES
- NEW ELECTRICAL CONDUITS (NOTE 2)
- NATURAL GAS PIPELINE

NOTES:

- BELOW GRADE PIPING TO BE PROVIDED WITH A MINIMUM OF 9 FEET OF COVER TO TOP OF PIPE.
- TIE IN TO ELECTRICAL SUPPLY AT EXISTING SWITCHGEAR AND TIE IN FIBER OPTIC CABLE TO EXISTING COMMUNICATIONS IN MILL BUILDING. FOR CONTINUATION SEE STEARNS-ROGERS MILL RECORD DRAWING 4-7-147.



FOR APPROVAL  
01-07-2022

REV	MM-DD-YY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP	NUMBER	REFERENCE DRAWINGS
C	01-07-22	ISSUED FOR APPROVAL	SNS	RCH	RCH	RSM	HBS		4-6-034	STEARNS-ROGER PIPING CONVEYOR & UTILITY TUNNELS PLAN AND SECTION
B	04-16-21	ISSUED FOR REVIEW AND APPROVAL	DBR	KPS	RCH	RSM	HBS		4-7-147	STEARNS-ROGER ELECTRICAL UTILITY TUNNEL BELT CONVEYOR No. 1 TO MAIN SWITCHGEAR BLDG TRAY & POWER LAYOUT
A	02-18-21	ISSUED FOR REVIEW AND APPROVAL	DBR	KPS	RCH	RSM	HBS			

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CLIENT PROJECT MGR	DEPARTMENT MGR	PROJECT MGR
PROJECT PHASE	FINAL DESIGN	
PROJECT NO.	BY	MM-DD-YY
32820176 / 244816	DES	DBR 02-18-21
SCALE	DRN	SNS 01-07-22
AS NOTED	CHK	RCH 01-07-22
	APP	RSM 01-07-22



**Climax Molybdenum**  
A Freeport-McMoRan Company

SUBJECT

HENDERSON MILL  
WATER TREATMENT PLANT  
SITE CIVIL & UNDERGROUND PIPING  
PLAN

AREA	530
CLIENT DWG NO.	
DRAWING NO.	530-DD10-PLN-601
REV	C

SAVED: 06-Jan-22 1:30 PM PLOTTED: 13-Jan-22 6:57 AM USER: STERITZ, SAMANTHA



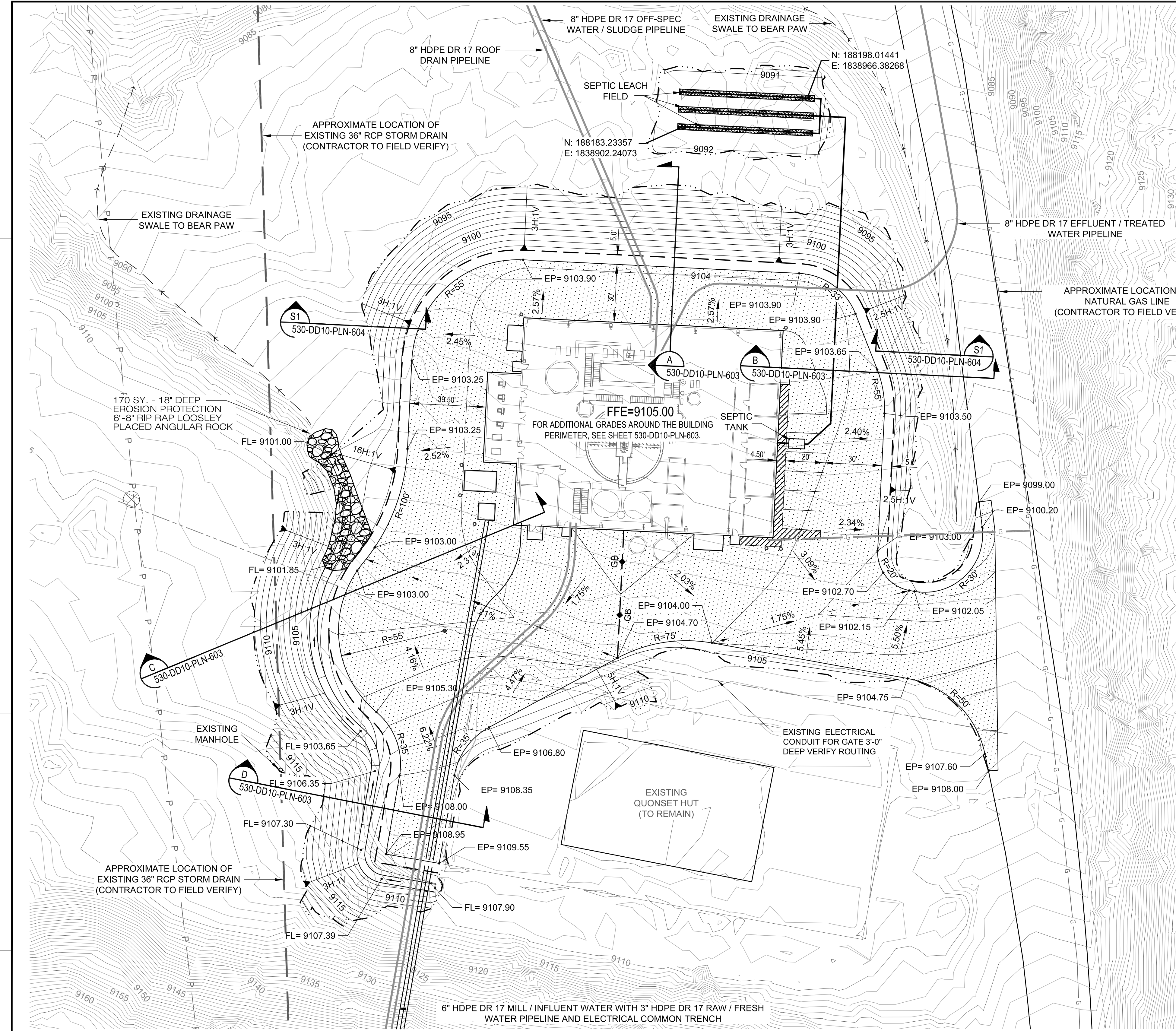
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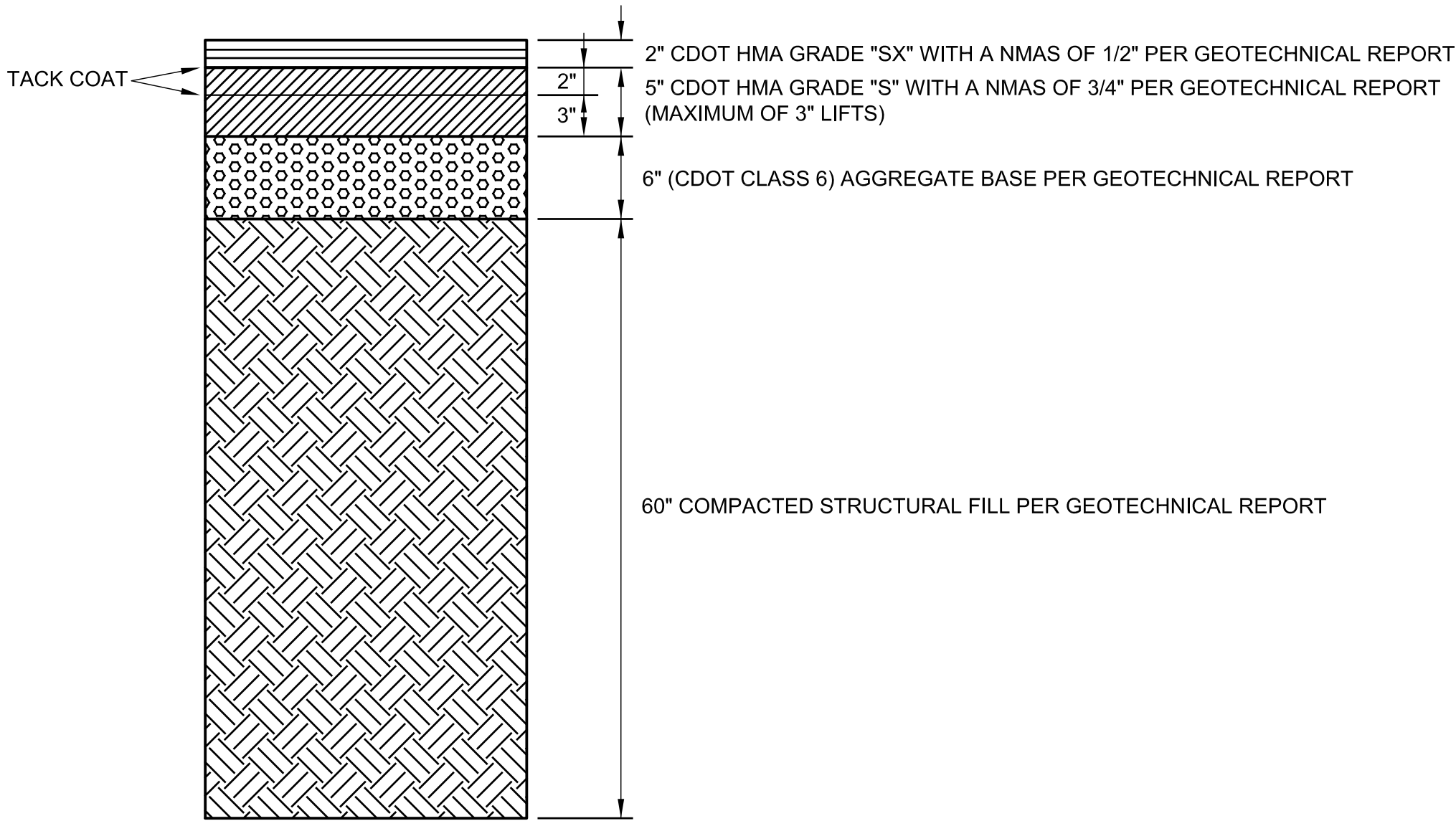


LEGEND

- EXISTING TOPOGRAPHY, 1-FT CONTOUR INTERVAL
- NEW PAVED AREA
- EXISTING NATURAL GAS LINE
- ACCESSIBLE WAY STRIPING
- FINISHED GRADE SECTION  
530-DD10-PLN-603
- SUBGRADE SECTION  
530-DD10-PLN-604

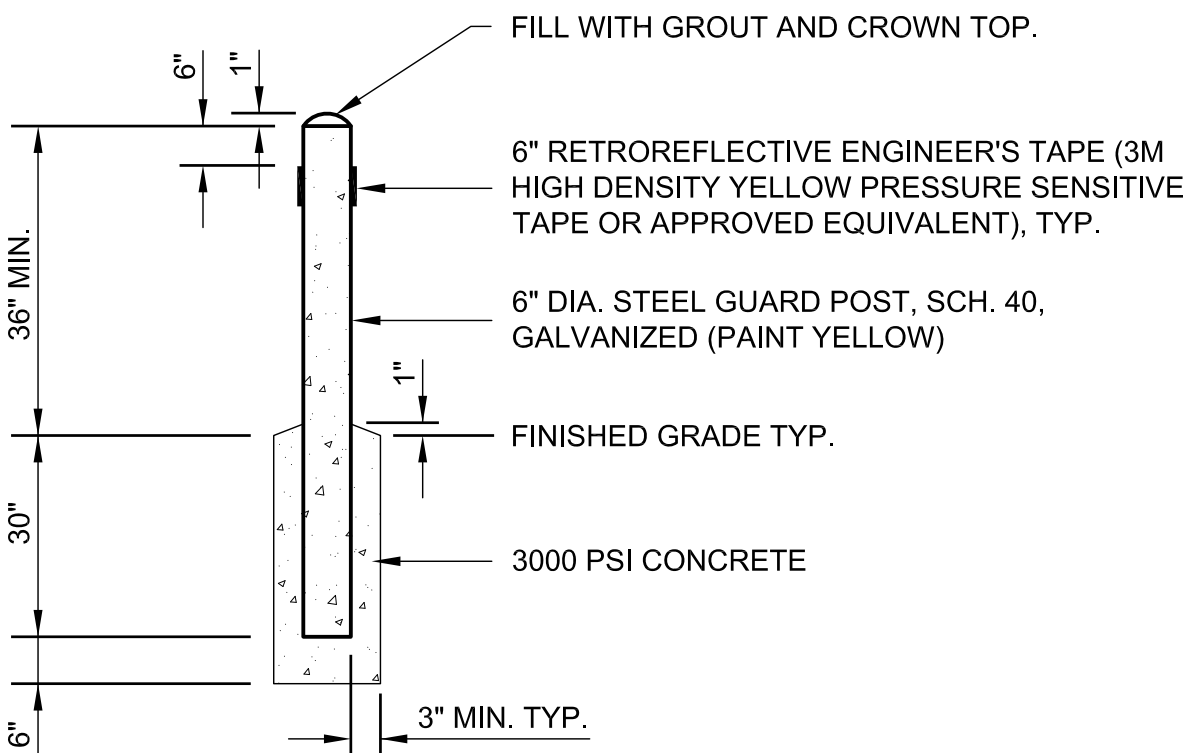
GB GRADE BREAKFL FLOW LINEEP EDGE OF PAVEMENTP EXISTING OVERHEAD POWER LINEEXISTING POWER POLENEW 6" STEEL BOLLARDLIMITS OF GRADING TO MATCH EXISTING

NOTE



STRUCTURAL PAVEMENT SECTION

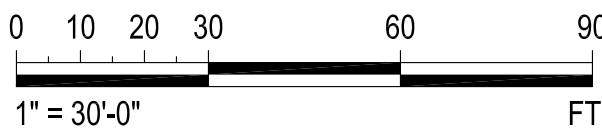
NTS



BOLLARD DETAIL

NTS

FORMERLY NUMBERED 530-DD10-PLN-603



FOR APPROVAL  
01-07-22

ANSI D-220.24  
C  
B  
A

D	01-07-22	ISSUED FOR APPROVAL	GGM	RCH	RCH	RSM	RBS		
C	05-20-21	ISSUED FOR 60% REVIEW	GGM	DCM	DCM	HBS			
B	02-23-21	ISSUED FOR APPROVAL	GGM	KPS	KPS	HBS			
A	12-23-20	ISSUED FOR REVIEW	GGM	KPS	KPS	HBS			
REV	MM-DD-YY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP	

GGM	RCH	RCH	RSM	RBS	
GGM	DCM	DCM	HBS		
GGM	KPS	KPS	HBS		
GGM	KPS	KPS	HBS		

NUMBER	TITLE
	REFERENCE DRAWINGS

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PROJECT PHASE		
FINAL DESIGN		
PROJECT NO.	BY	MM-DD-YY
32820176 / 244816	DES	GGM 11-30-21
SCALE	DRN	GGM 11-30-21
AS NOTED	CHK	RCH 01-07-22
	APP	RSM 01-07-22

**Climax Molybdenum**  
A Freeport-McMoRan Company

SUBJECT  
HENDERSON MILL  
WATER TREATMENT PLANT  
PAVING & GRADING  
PLAN

AREA  
530  
CLIENT DWG NO.  
DRAWING NO.  
530-DD10-PLN-602

REV D

SAVED: 06-Jan-22 2:01 PM PLOTTED: 09-Jan-22 10:30 AM USER: STERITZ, SAMANTHA



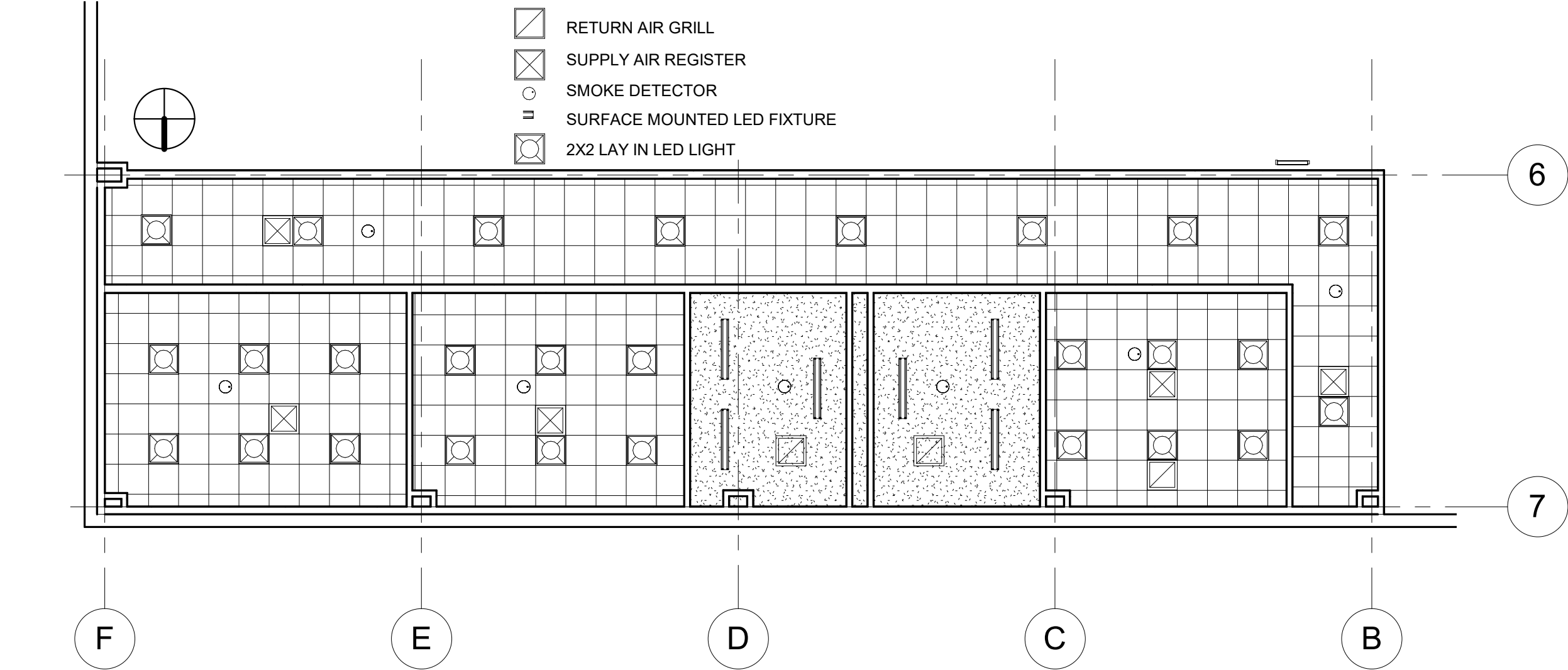
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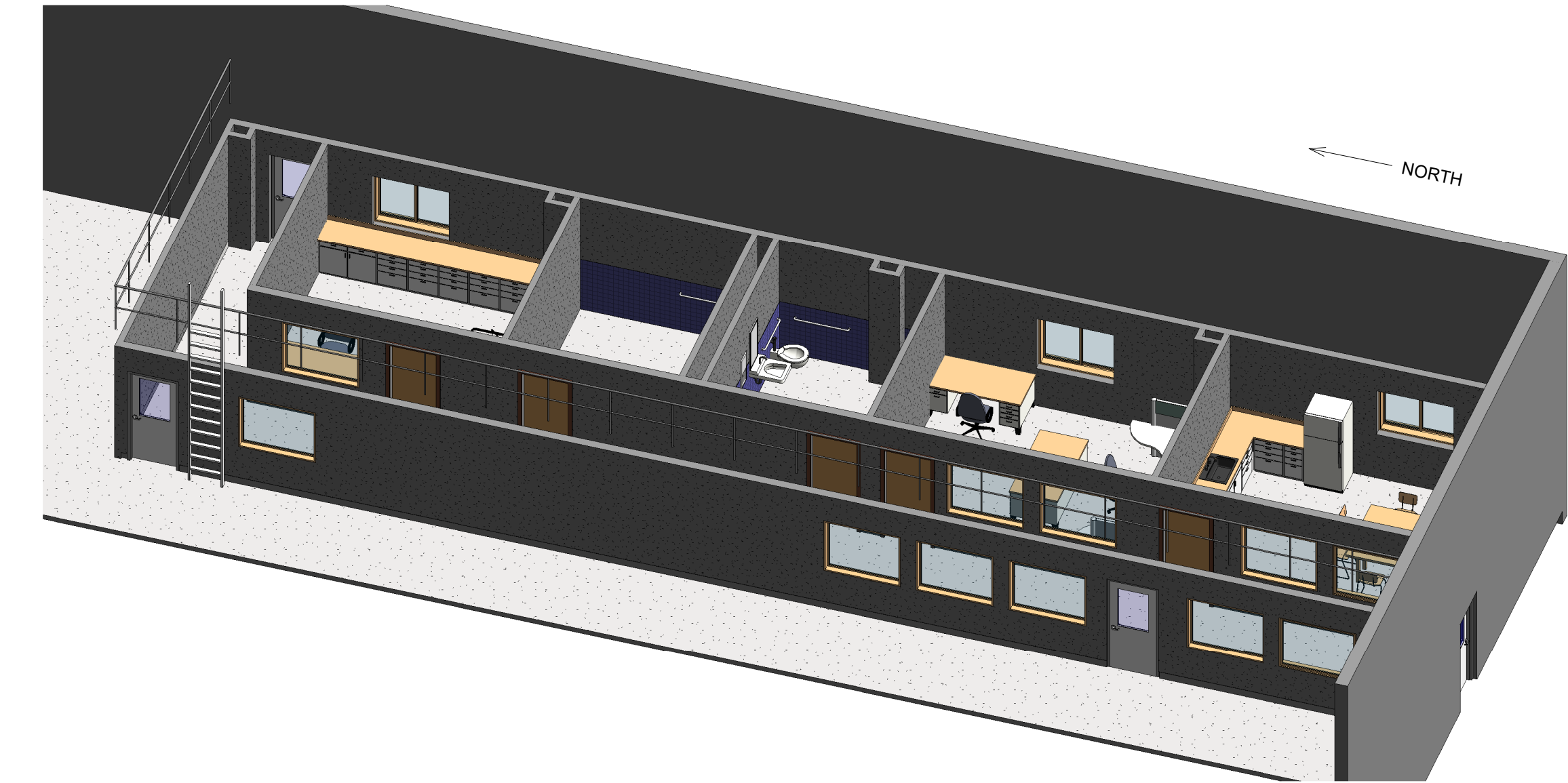
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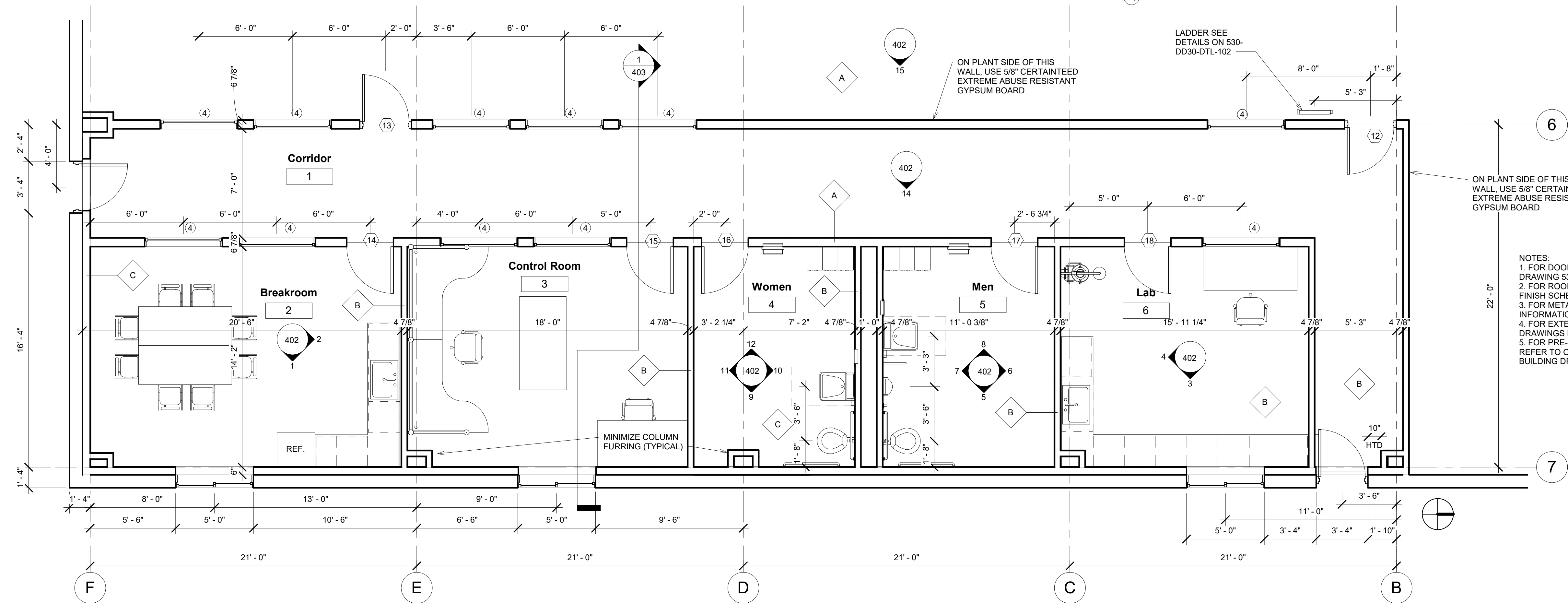
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2 Reflected Ceiling Plan  
1/8" = 1'-0"



10 3D View



1 Floor Plan  
1/4" = 1'-0"

NOTES:  
1. FOR DOOR AND WINDOW SCHEDULE SEE DRAWING 530-DD30-SHD-601  
2. FOR ROOM SCHEDULE AND INTERIOR FINISH SCHEDULE SEE 530-DD30-PLN-403.  
3. FOR METAL STUD WALL AND ROOF JOISTS INFORMATION SEE 530-DD30-PLN-404.  
4. FOR EXTERIOR DOOR AND WINDOW DRAWINGS REFER TO 530-DD30-PLN-300.  
5. FOR PRE-ENGINEERED METAL BUILDING REFER TO CECO PRE-ENGINEERED METAL BUILDING DRAWING.



FOR APPROVAL  
01-14-2022

REV	MMDDYY	REVISION/ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP	APP	REFERENCE DRAWINGS
B	01-14-22	ISSUE FOR APPROVAL GENERAL REVISIONS	TA	JB	JB	HSB	RSM			A-404 METAL STUD DETAILS
A	05-20-21	ISSUED FOR APPROVAL	DB		HBS					A-403 SECTIONS
										A-402 ELEVATIONS

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PROJECT PHASE	FINAL DESIGN	
PROJECT NO.	BY	MMDDYY
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SCALE:	DRN DB	05-06-21
AS NOTED	CHK	
	APP HBS	05-06-21

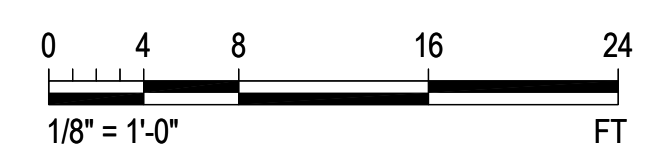
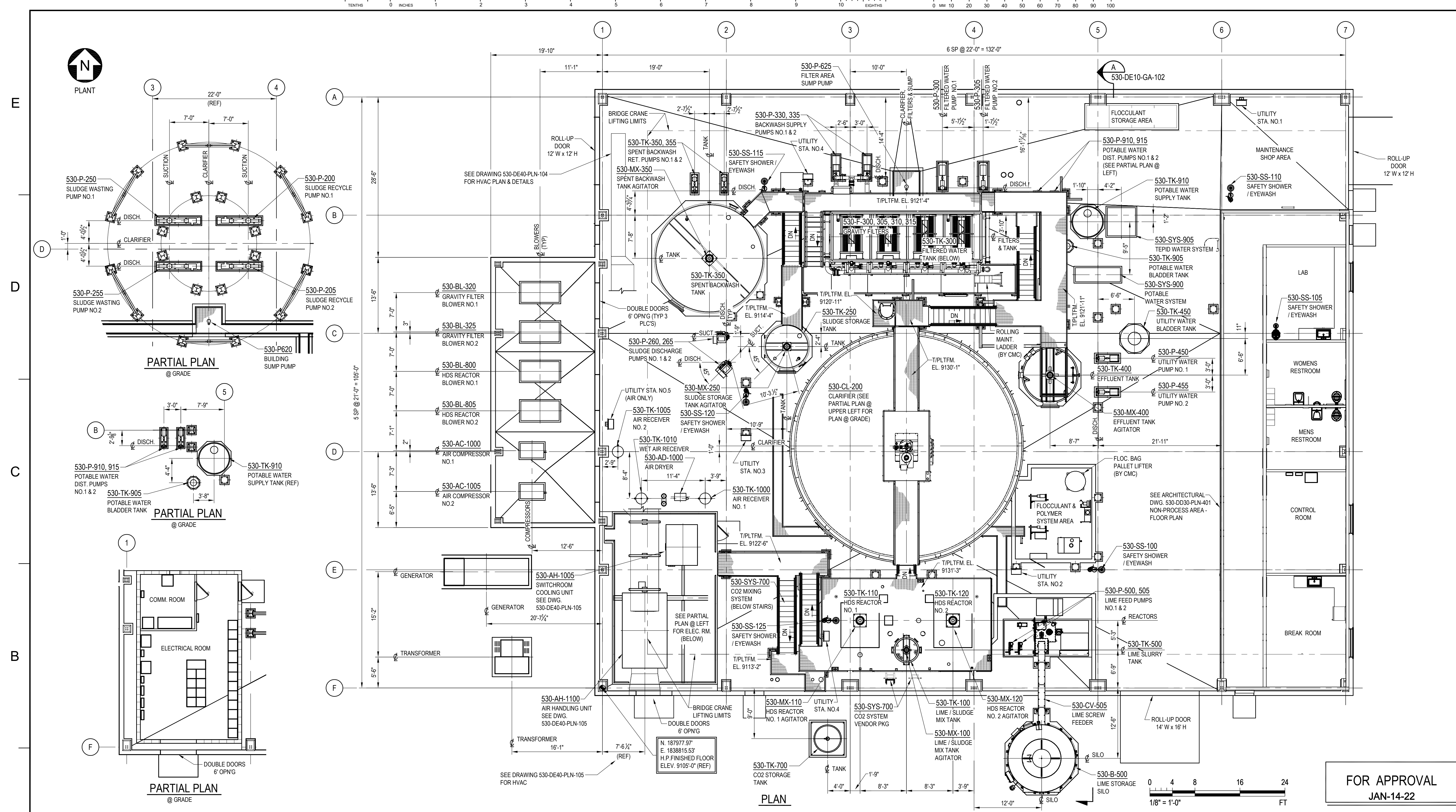
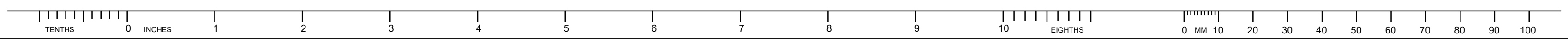
 **Climax Molybdenum**  
A Freeport-McMoRan Company

SUBJECT  
HENDERSON MILL  
WATER TREATMENT PLANT  
NON-PROCESS AREA  
FLOOR PLAN

AREA  
530  
CLIENT DWG NO.  
DRAWING NO.  
530-DD30-PLN-401

**wood.**





FOR APPROVAL  
JAN-14-22

REV	MM-DD-YY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP	TITLE	REFERENCE DRAWINGS
D	01-14-22	ISSUE FOR APPROVAL	MIT	CMT	RSM	HBS			530-DE40-PLN-104	HVAC
C	08-26-21	ISSUE FOR DESIGN	MIT	CMT	RSM	HBS			530-DD10-PLN-601	SITE CIVIL - PLAN
B	07-23-21	ISSUE FOR APPROVAL	MIT	RSM	HS				530-DD30-PLN-401	NON-PROCESS AREA - FLOOR PLAN
A	09-10-20	ISSUE FOR REVIEW	MIT	RSM	HS				NUMBER	
REV	MM-DD-YY									

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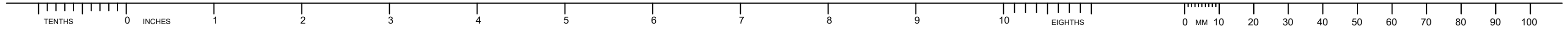
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PROJECT PHASE	FINAL DESIGN	
PROJECT NO.	32820176 / 244816	BY
SCALE	1/8" = 1'-0"	MM-DD-YY
		SUBJECT
		HENDERSON MILL
		WATER TREATMENT PLANT
		GENERAL ARRANGEMENT
		PLAN

**Climax Molybdenum**  
A Freeport-McMoRan Company

**wood.**

AREA	530
CLIENT DWG NO.	
DRAWING NO.	530-DE10-GAD-101
REV	D





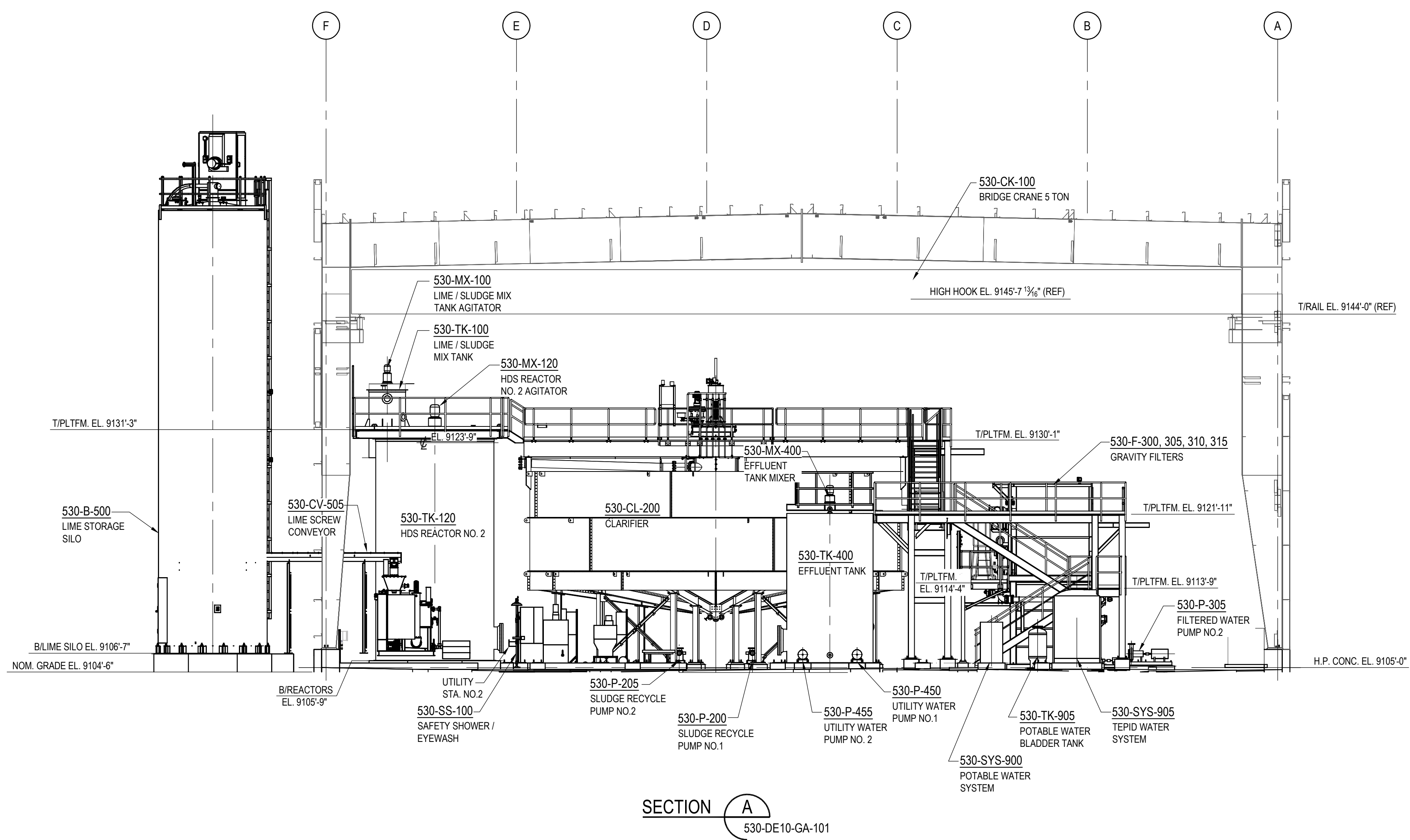
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SECTION A  
530-DE10-GA-101



FOR APPROVAL  
JAN-14-21


REV	MM-DD-YY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP	NUMBER	TITLE	REFERENCE DRAWINGS
C	01-14-22	ISSUE FOR APPROVAL	MIT	CMT	RSM	HBS					
B	07-23-21	ISSUE FOR APPROVAL	MIT	RSM	HS						
A	09-10-20	ISSUE FOR REVIEW	MIT	RSM	HS						

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CLIENT PROJECT MGR	DEPARTMENT MGR	PROJECT MGR
PROJECT PHASE	FINAL DESIGN	
PROJECT NO.	BY	MM-DD-YY
32820176 / 244816	DES MIT	09-08-20
SCALE	DRN	MIT
AS NOTED	CHK CMT	09-10-20
	APP RSM	09-15-21
		01-14-21



**Climax Molybdenum**  
A Freeport-McMoRan Company

SUBJECT

HENDERSON MILL  
WATER TREATMENT PLANT  
GENERAL ARRANGEMENT  
SECTION

AREA	530
CLIENT DWG NO.	
DRAWING NO.	530-DE10-GAD-102
REV	C