APPLICATION

FOR

REVISION OF MINE PERMIT #C1002RE

FROM STANDBY TO ACTIVE STATUS

AND

MODIFICATION OF GROUND WATER DISCHARGE PERMIT DP-61

MT. TAYLOR MINE, SAN MATEO, NEW MEXICO

RIO GRANDE RESOURCES CORPORATION

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Prepared by

Alan Kuhn Associates LLC

with

EL Engineering Services

Trinitek Services, Inc.

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1 INTRODUCTION

1.1 Permit Background

1.1.1 Mine Permit

The Mt. Taylor Mine is an existing uranium mine as defined under the New Mexico Mining Act of 1993, NMSA 1978 Section 69-36-3 (E). Existing-mine permit #C1002RE was issued to Rio Grande Resources (RGR) for the mine by the New Mexico Department of Energy, Minerals and Natural Resources, Mining and Minerals Division (MMD) on July 28, 1995 in accordance with NMSA 1978, Section 69-36-1 e.t seq. and the New Mexico Mining Act Rules, 19.10.5 NMAC. A closeout plan was approved by MMD on December 18, 1998, under permit revision 98-1. A closeout/ closure plan (CCP) that addresses the requirement for return to active status of the Mine Permit #C1002RE and Discharge Permit DP-61 was submitted in April 2013 and Revision 1 of that CCP was submitted with this revised application.

RGR applied for standby status for the mine permit in accordance with 19.10.7 NMAC on March 25, 1999. MMD approved standby status on October 12, 1999 under permit revision 99-1 for a term that ended on October 7, 2004. RGR applied for a first renewal of standby status on September 24, 2004, which MMD approved on July 27, 2005, under permit revision 04-1, for a term that ended on July 5, 2010. The second renewal of standby status was granted on January 30, 2012 for a term beginning July 5, 2010 and ending October 12, 2014 (MMD 2012).

In July 2012 RGR submitted an update to the closeout/closure plan for the mine that addressed existing conditions. The closeout plan update was required as condition BB of the MMD's second renewal of standby status (MMD 2012) and included an estimate of financial assurance based on reclamation of presently existing conditions at the mine.

1.1.2 Discharge Permit

Discharge Permit 61 (DP-61) was originally issued by the New Mexico Health and Environment Department, Environmental Improvement Division (NMEID) to the original owner of the mine, Gulf Mineral Resources Company, in 1979 under the Water Quality Act, and 20.6.2.3104 -3111 NMAC. This permit sets conditions for effluent or leachate discharge from the mine facilities. DP-61 (NMED ID 2688)

was subsequently modified and renewed by NMEID in 1984 and 1989, and in 1995 by the New Mexico Environment Department (NMED). The permit has been in timely renewal since 1999, during which time several contaminant investigations and an abatement plan have been conducted. The DP-61 closure plan was submitted in 1998.

1.1.3 Return to Operating Status

In accordance with 19.10.5.505 and 19.10.7.701 NMAC, RGR is submitting this application to return the Mt. Taylor Mine permit #C1002RE to operating (also known as active) status by not later than October 12, 2014 before the end of the second standby renewal period. The following information is provided in support of this application as well as modification of DP-61.

1.2 Project Description and History

Rio Grande Resources Corporation (RGR) is owner and operator of the Mt. Taylor Mine, an underground mine located in Cibola County, New Mexico. The surface facilities of the mine are located in Section 24, T13N, R8W, NMPM (Figure 1-1) 1/2 mile northeast of the Village of San Mateo and are accessible from New Mexico State Route 605. The Mt. Taylor Mine was developed in the 1970's by Gulf Mineral Resources Company and placed into production in 1980. Ownership was transferred to Chevron Resources Company (Chevron) in 1985 when the two companies merged. At the time of this application, the mine remains on standby after mining operations were suspended in 1990 due to the depressed uranium market. RGR acquired the mine in 1991; the mine has been in standby since RGR purchased the property.

Approximately 675,085 tons of ore and approximately 698,000 tons of waste rock were mined at the Mt. Taylor Mine before Chevron suspended production. Uranium ore was extracted from depths of over 3,000 feet below ground surface from ore zones of the Morrison Formation (Figure 1-2) using room-and-pillar and stope mining methods. Two shafts, one for hoisting ore and material to ground surface and the other for hoisting men and material, connect the surface to the underground mine. Surface facilities occupy only a small part of the total mine permit area (Figure 1-3).The ore was shipped off site for milling; there are no mill facilities present within the mine permit area.

Pumping of ground water from wells began in the early 1970's and was necessary to gain access to the ore zones. The wells are described on Figure 1-4 and Figure 1-5 and on Table 1.1. The ground water

was removed from various water-bearing strata down to and including the mine level to depressurize the ground where shafts and underground workings were developed. Water thus removed is called mine water. Mine water removed from the ore-bearing strata of the mine was treated to remove radium before discharge. The current water levels in the wells are listed in Table 1.2. Upon return to operating status, and before production of ore can resume, the mine will have to be dewatered again. The wells used to depressurize (dewater) the mine have remained during standby and will be reactivated for this purpose. The water will be treated to reduce uranium and radium concentrations to current regulatory limits.

Five observation wells were installed into the Westwater level for monitoring drawdown during the initial dewatering of the mine. One of these observations wells, OBW 24-85 located at N 1579711 E 2783249, is in the mine area near dewatering well #8, and the other four are located outside of the mine area at locations shown on Figure 1-6. These wells have not been used during mining operations or standby but will be used to monitor drawdown in the Westwater aquifer during reactivation and later mine shutdown.

The functions and overall dimensions of the Mt. Taylor Mine units described in the Mine Permit Application of December 1994 remain unchanged. The existing mine units will be reactivated and upgraded as necessary to meet current regulatory standards. These upgrades will create no changes to the "nature or scale" of the mine units (19.10.5.505 B (1) (c) NMAC), but some of the upgrades will change shapes and sizes of individual components of some mine units. More detailed descriptions of the mine units are provided in Section 2 of this application.

1.3 Regulatory Requirements for Reactivation to Operating Status

1.3.1 MMD Requirements

As required by 19.10.7.701 H NMAC, RGR is applying to MMD to revise mine permit #C1002RE for the Mt. Taylor Mine to return to operating status from standby status before the end of the second standby renewal period. This application also responds to the requirements of 19.10.5.505 NMAC for existing mine permit modifications or revisions. Submitted under separate cover with this application is the Closeout/Closure Plan (CCP), Revision 1, required by 19.10.5.506 NMAC, modified from the 1998 Closeout Plan and incorporating relevant upgrades to current best practices as well as changes in the post-mining land uses.

1.3.2 NMED Requirements

Regulations issued pursuant to the New Mexico Water Quality Act provide that a discharge permit may be required for certain discharges that may move into groundwater (20.6.2.3104 NMAC). RGR has obtained a discharge permit under Water Quality Act regulations that is under renewal pursuant to 20.6.2.3106 F since 1999. This discharge permit allows the discharge of water pumped from the mine into the mine water treatment area. NMED has no requirements for a permit revision comparable to those of MMD but requires a discharge permit modification, defined in 20.6.2.7 P NMAC. In addition, 20.6.2.3107 C NMAC requires notification to NMED of any facility expansion, production increase or process modification that would result in any "significant modification" in the discharge of water contaminants. "Significant modification" in this context is not defined, but RGR is of the opinion that the upgrades proposed in Section 3 of this application may be handled as a modification to DP-61. This application seeks to modify DP-61.

1.3.3 US EPA Requirements

40 CFR 440.32 (a) establishes effluent limitations representing the degree of effluent reduction in uranium mine drainage attainable by the application of the best practicable control technology currently available (BPT) for existing sources. The effluent limitations are enforced through NPDES #NM 0028100 administered by NMED in accordance with 20.6.2.2001 NMAC. The upgrades proposed in Section 3 are designed for BPT to attain the EPA's effluent standards.

1.4 Purpose and Scope

This document provides information, as required by the mine permit and discharge plan as well as the foregoing state and federal requirements, to support RGR's application to revise the status of the Mt. Taylor mine from standby to operating status and to modify DP-61. This information includes the closeout / closure plan (CCP) of April 2013, revised from the CCP submitted in July 2012, which addressed existing conditions only, to cover the extent of disturbances associated with ultimate mine buildout for the remainder of the mine life.

1.5 Content of the Application

In addition to the foregoing information, this application contains description of the existing mine units in Section 2, upgrades (Section 3), and rehabilitation (Section 4) of existing mine units. Section 5 addresses other permits that will be affected by mine reactivation. Section 6 describes changes or updates in environmental monitoring related to return to operating status. The operations, health and safety plans that will be required for operations are briefly described in Section 7; the actual plans will be prepared after approval of the change in mine permit status. The tentative schedule for mine reactivation is provided in Section 8. Section 9 summarizes the closeout/ closure plan. Appendices to this application include Appendix A (drawings), Appendix B (engineering analyses), Appendix C (permits), Appendix D (IX plant design), and Appendix E (Pipe Outfall Investigations).

2 EXISTING MINE UNITS

The existing mine units are located on 285.6 acres of the 4006.7 acres included in the mine permit area. Approximately 148 acres are disturbed land and the remaining 138 acres are undisturbed. The Mine Unit, consisting of the underground workings, shafts, and conduits, has no surface disturbance other than that included in the Service and Support Facilities Unit (shaft collars, vent raises). The other units and their disturbed land consist of:

- Service and Support Area – 93.0 acres
- Mine Water Treatment Area - 28 acres
- Ore Stockpile - 6.8 acres
- Waste Rock Pile - 11.5 acres
- Storm Water Retention Ponds (2) - 3.7 acres

These facilities are shown on Figure 2-1 and are described in more detail in the existing mine permit.

The Treated Mine Water Discharge Pipeline (pipeline) extends 4.3 miles from the mine permit area to the outfall point in San Lucas Canyon north of the mine (Figure 2-2).

A maintained gravel access road, NM 334, bisects the mine site and covers 4.7 acres. This is a state road and right-of-way, maintained by Cibola County, which provides public access to the west edge of the Cibola National Forest; it is not part of the mine permit area.

The following subsections describe the existing units of the mine that will be reactivated. These units are defined by function rather than space or dimension, so some units physically overlap others. Additional description of mine units is provided in the Closeout/ Closure Plan submitted with this application.

2.1 Mine Unit

The existing underground mine facilities, including the shafts, shaft stations, drifts, utility conduits, and utilities serving the underground space, constitute the Mine Unit. Upon returning to operating status, restoring the functionality of these facilities will require some repairs and replacement, some of which will have long lead times. When mining resumes, the underground workings will expand, but none of this expansion is expected to affect ground surface unless a new vent shaft is needed approximately 10 years after restart of the mine operations. If this additional shaft is needed, RGR will submit an application for revision of the mine permit to include this new unit.

2.2 Mine Dewatering and Mine Water Treatment

In the late-1970's, the deep wells and the mine water treatment unit (MWTU) were constructed onsite to pump water from the mine and treat the mine water to meet the discharge standards in effect at that time. A number of wells were constructed in three phases corresponding to the successively deeper aquifers between ground surface and the ore body. The MWTU consisted of eight ponds with a combined water capacity of approximately 62 acre-feet for reducing radium, heavy metals, and total dissolved solids and IX plant for capturing natural uranium. The facilities that remove groundwater from the mine and treat the water before release into the pipeline constitute the mine dewatering and water treatment unit (Drawing MT13-AC-01 and MT13-AC-02). This unit includes the dewatering wells, the network of pipes that convey the mine water, the ion exchange (IX) facility, the barium chloride facility, the water treatment ponds, and the hydraulic structures that connect the ponds.

2.2.1 Dewatering Wells

Several aquifers exist between ground surface and the mine level (Figure 1-2). Each of these must be depressurized sufficiently for mining to be resumed. The dewatering (depressurizing) wells were constructed and operated in three phases to dewater the mine area from shallowest to deepest

aquifers. The locations of the wells are shown on Drawing MT13-AC-01 and Figure 1-4. Well descriptions are listed in Table 1.1, and well water levels are listed in Table 1.2.

2.2.2 Mine Water Treatment

Ground water in the Westwater Member of Morrison Formation (ore host rock) at mine level contains concentrations of uranium and radium above the human health standards for ground water quality in 20.6.2.3103A NMAC, so the water pumped from the mine level is treated to reduce levels of these two contaminants. No other constituents exceed the ground water quality standards. Pond sediments from previous mine water treatment tested negative for filterable toxicity characteristics per 40 CFR 261.24. No measureable concentrations of "toxic pollutants", as defined in 20.6.2.7 WW NMAC, have been detected in the mine water. Historical deep ground water quality data are listed in Table 2.1. Ion exchange and barium chloride treatment are used to remove uranium and radium, respectively, from the mine water.

The IX Plant was first authorized by the New Mexico Radiation Protection Bureau (now the Radiation Control Bureau) in 1981 under license #NM-GMT-IX-R1-01. The plant was run for three weeks of testing in the 1980's. After testing, the IX resin was removed and transferred to the Kerr-McGee uranium mill in Ambrosia Lake. The interiors of the resin tanks were rinsed with clean water. The plant has not been operated since that time because 1) uranium discharged in the mine water met the water quality standards in effect at the time without the need for treatment, and 2) the mine went on standby status in 1990.

When mine dewatering resumes, the initial pumping capacity may be up to 12,000 gallons per minute (gpm) but pumping rates will be limited by the capacities of the IX and barium chloride treatment facilities. After target water levels are achieved, the sustained pumping rates are expected to range from 4000 to 5000 gpm. The volume varies due to the amount of recycled water, which is utilized underground for drill water, pump seal water and cooling water, and by underground mine development.

Under normal operating conditions, raw mine water is first treated to reduce the level of particulates by addition of a flocculant, anionic polyacrylamide or equivalent. The normal rate of flocculant addition is 0.5- 1.5 ppm. With this addition, the mine water flows through three settling ponds (#1, 2 & 3). The water discharged from pond 3 is routed to the uranium ion exchange plant (IX unit). The IX unit is

presently designed to process a water volume of 5,000 GPM, but has an expansion capability to 10,000 GPM. The water discharged from the IX unit is then directed through the radium treatment system (Figure 2-3) where barium chloride is added continuously at the rate of 15 ppm, followed by addition of a second flocculant, Nalco 7852 or equivalent, a cationic flocculant ($C_8H_{16}NCl_nC_3H_5NO_n$ or similar composition), to enhance settlement of the barium -radium sulfate precipitate. Lagoon numbers 8, 4 and 5 are sequentially fed by gravity flow to allow ample time for precipitation. The water continues finally into retention ponds # 6 and 7 to be discharged or partially recycled back into the mine. The 24 inch discharge pipeline carries the treated water at approximately 4000-5000 GPM over the 4.3 miles north to the discharge point at outfall 001 in an unnamed arroyo in San Lucas Canyon.

The flow system through the six major treatment ponds is designed to allow isolation of each pond if, or when, clean-out or repair becomes necessary.

During the periods of prior operation, the ion exchange facility was not operated because uranium concentrations in the ground water did not exceed the maximum concentration limits in effect at that time. The ion exchange building and equipment remain intact, but the IX circuit will be reconfigured and new equipment installed.

2.2.3 Treatment Ponds

Except for ponds 6 and 7, the mine water treatment ponds had compacted clay liners. Ponds 6 and 7 were lined with hypalon geomembrane, which is no longer serviceable. The clay liners of the other ponds remain in place but do not meet the current standards of liners designed for ground water protection (NMED 2007; 40 CFR 440 Subpart C: 40 CFR 264 Subpart K). The hydraulic structures that connect the mine water treatment facilities consist of concrete and steel pipes, channels, gates, weirs, and screens. These structures remain largely intact but will require some repairs and reconditioning. The inlet hydraulic structures at the east ends of ponds 6 and 7 were used in the initial dewatering phase of mine development and are no longer needed; they will be removed.

2.2.4 Discharge Pipeline

During mining, part of the treated mine water is used on site and part is discharged off site. Treated water is used for general plant water supply and for cooling water in the mine air refrigeration plant. The remainder is then pumped through a 4.3 mile long, 24-inch pipeline and discharged to San

Lucas Canyon (Figure 2-2) under authority of NPDES permit # NM0028100. The pipe consists of 1/4-3/8 inch wall thickness steel sections welded in the field.

During its review of Revision 0 of this application, the Ground Water Quality Bureau of NMED raised a question about potential uranium contamination of soil or ground water near Outfall 001 stemming from the less stringent standard for uranium in the previously discharged water (5 mg/L) than currently exists (0.03 mg/L). To address this question, RGR conducted an investigation to characterize the existing uranium content in soil and ground water in the vicinity of the outfall. The methods and results of this investigation are documented in Appendix E. Uranium content of outfall-area soils is slightly above to below detection limits, indicating that there has been no soil contamination from treated mine water discharge. Ground water was found in three of the four drill holes to bedrock at the base of alluvium. Uranium in water samples showed concentrations of uranium below the 0.03mg/L standard.

2.3 Service and Support Facilities

Service and Support facilities include all surface functions other than mine water treatment, ore stockpiling, and mine waste rock disposal. The location and identification of these facilities are shown on Figure 2-1.

Service facilities are those units at ground surface that support the overall mine operation but do not provide direct support of underground operations, and that will be either removed from the site or converted to post-mining use after closeout. These facilities include the guard house, fire equipment building, service building, electrical substation, car shop, carpenter shop, electrical building, waste treatment building, storage building, core storage building, water tanks, fuel storage tanks, fan shop, septic tank, leach field, sanitary treatment plant (STP), and water wells for potable water supply to the mine.

During mine standby, the STP was not operated, and the small volume of sanitary waste from mine facilities was treated through a septic tank and leach field. Upon mine reactivation, the STP will be put back in operation and the septic tank and leach field will remain available if needed. The STP is permitted under DP-61 and the outfall for its discharge is permitted under NPDES #NM0028100.

Support facilities consist of those facilities at ground surface that have a direct function in underground mining operations and that will be either removed from the site or converted to post-mining use after

closeout. These units supply air for ventilation; pumping of water from the underground space; cooling and heating of underground air; and hoisting of personnel, materials and ore to and from the underground mining levels. The present mine support facilities include the compressor buildings, York chiller, cooling tower, pump building, shaft heating building, hoist house, head frames, and exhaust fans.

An electrical substation is located at the north side of the Service and Support facilities area. This substation, owned by the Continental Divide Electrical Cooperative and Public Service of New Mexico, is not part of the mine permit but provides electrical power for mine operations.

2.4 Waste Water (Sewage) Treatment Plant

The sewage treatment plant (STP) (Drawing MT13-AC-14) consists of two side-by-side, packaged, Case/Cotter extended aeration plants. Each of these units is capable of treating up to 25,000 gallons per day of waste water from the surface facilities. These units are designed for pre-grinding and screening, aeration, settling (with a sludge return from the settling tank to the aeration tank) and chlorination.

During standby, the STP is inactive, and sewage is handled through a septic tank and leach field. When the STP is active, all final effluent is treated with chlorine, either by gas metering installation or by using HTH cakes at the discharge end of the STP unit. The effluent discharge is metered as it flows into a concrete retaining sump where it is collected for discharge. The pumping system, automatically controlled by high/low level probes, consists of one 10 horsepower pump with a second pump alongside for standby replacement.

When the STP is active, treated effluent is pumped directly into the 24- inch treated mine water pipeline at outfall 01A where it comingles with the treated mine water and monitored to ensure that discharge standards are met. During previous operation of the STP, the average daily discharge from the STP units was 0.0109 million gallons (or 10,900 gallons), which equates to an average of approximately 7.57 gpm. Table 2.2 shows the quality of certain parameters of water discharged from the STP unit.

The STP discharge is combined with the treated mine water and discharged to San Lucas Canyon permitted under NPDES #NM 0028100.

2.5 Waste Pile

The waste pile occupies 11.5 acres in the southwest corner of the surface facility area. Upon resumption of mining, waste rock will be placed on this pile until it reaches the maximum build-out configuration (Drawing MT13-AC-08). The waste pile contains waste rock, excavated during mine development and production, from non-ore bearing formations or below-ore-grade rock from the mine. The mound of material at the southwest corner of the waste pile is primarily shaft muck excavated from strata above mine level, making its radionuclide content essentially background level.

The waste pile also contains a variety of non-rock waste from the mine such as rock bolts, timbers, and other hardware. These materials occur randomly throughout the pile. There was no record kept of the quantities and locations of placement of these materials in the waste pile.

Analyses were performed previously to determine the structural stability (resistance to mass movement) of the pile upon ultimate buildout, the largest size that the pile could have. This condition would include slopes that are higher than those that exist now. The results of these analyses, documented in Appendix B of the Closeout/ Closure Plan, show that the minimum factors of safety are 2.42 under static load conditions and 1.61 under pseudostatic (earthquake) load conditions. These values are well above the minimums necessary (1.00) to ensure stability.

2.6 Ore Stockpile

The ore stockpile presently covers 6.8 acres and contains approximately 60,000 tons of low-grade ore. The entire surface of the ore is covered with approximately two feet of native soil that is supporting well-established volunteer vegetation consisting mostly of grasses.

Upon resumption of mine operations, the existing stockpile of ore will be shipped off site to be used as feed stock in uranium milling. Ore stockpile cover soil that contains radium levels above the 6.8 pCi/g cleanup standard will be placed on the waste pile. Soil with radium below the cleanup standard will be placed on the waste pile as interim cover, an initial layer of the final cover, or on the outslopes regraded during mine reactivation. After the stockpiled ore is removed, the ore pad will be reconstructed to current standards, as described in Section 3.3.

2.7 Storm Water Retention Ponds

Two storm water retention ponds capture and retain runoff from areas of the mine surface that contain ore or waste rock. The sediments in both ponds have radium levels exceeding the 6.8 pCi/g limit; these sediments will be removed and placed in a clay-lined disposal cell on the waste pile (Section 3.2.1).

The north pond (ore pad runoff retention pond) is 0.9 acres and located between the ore stockpile and the mine water treatment area. It retains runoff from the ore stockpile and holds it until it evaporates. When the mine returns to active status and before ore production resumes, this pond will be reshaped and a double liner with a leak detection and collection system will be installed to receive runoff from the ore pad.

The south storm water retention pond, 1.45 acres, retains storm water from the waste pile and a portion of the Service and Support facilities area. After contaminated sediments are removed to the waste pile disposal cell, this pond will be upgraded with a clay liner because this pond will receive runoff only after infrequent storm events.

Presently, Pond #2 in the mine water treatment unit receives most of the runoff from the Service and Support unit area through a system of subgrade drainage pipes. When the mine returns to active status, this runoff will be diverted to the south storm water retention pond and to arroyos north and south of the mine site, similar to the natural, pre-mining drainage patterns.

2.8 Access Road

The maintained gravel road, NM 334, is a public road and right-of-way, totaling approximately 4.7 acres, maintained for the State of New Mexico by Cibola County, that provides access to the west edge of the Cibola National Forest. Although this road bisects the mine, it is not part of the mine permit area and is not subject to actions by RGR for mine reactivation.

3 UPGRADES TO EXISTING MINE UNITS

In the years since the mine was built, technical advances and regulatory changes have occurred that will necessitate upgrades to the mine upon return to active status and before actual ore production resumes. The proposed upgrades are described in the following sections.

3.1 Mine Water Treatment Unit

The Mine Water Treatment Unit (MWTU) will be the first unit to be reactivated. Dewatering wells will be reconditioned as necessary and refitted with pumps while MWTU upgrades are being made. Pumping will start as soon as the upgrades of the treatment system and pipeline, described below, are completed. The sequencing and rate of pumping is an operational decision that will be made, and modified as necessary, by the mine manager to reduce the hydrostatic pressure on the shafts at a controlled, safe rate. Initially, the Phase I wells will be pumped at or near nominal capacity (approximately 300 gpm each). When the mine manager has determined that hydrostatic pressures have been reduced by Phase I well pumping through the Pt. Lookout zone sufficiently, pumping from the levels down to the Westwater will begin on Phase II and III wells at rates up to 700 gpm each.

The rate of pumping will be constrained by both the net hydrostatic pressures on the shaft liners and the rate at which the mine-level water can be treated to release standards. IX treatment capacity of up to 10,000 gpm, the total from all wells, will limit the rate of pumping during initial depressurizing. Once the cone of depression around the shafts is established, pumping rates will be reduced to 4000-5000 gpm for the total well system.

40 CFR 440.32 (Subpart C), 7–1–96 Edition, requires Best Practicable Control Technology Currently Available (BPT) for effluent discharges from uranium mines. BPT is defined at Section 304(b)(1) of the Clean Water Act (CWA). In specifying BPT, EPA considers a number of factors including the total cost of applying the control technology versus effluent reduction benefits, the age of the equipment and facilities, the processes employed and any required process changes, engineering aspects of the control technologies, and non-water quality environmental impacts including energy requirements (US EPA 2012).

Mine water, intended for discharge such that it could impact ground water, must meet the human health standards established by the New Mexico Water Quality Act through 20.6.2.3103A and 20.6.2.3109 C(2) NMAC or existing concentration as provided for in 20.6.2.3101 and 20.6.2.3103 NMAC. The Mt. Taylor mine water contains levels of radium and uranium prior to treatment that may exceed discharge standards. The mine water treatment system will remove particulates, uranium, radium 226 and other parameters (possibly selenium) that might exceed the New Mexico Water Quality Control Commission Regulations before any discharge.

Uranium concentrations in the mine water are expected to exceed the 20.6.2.3103A NMAC standard of 0.030 mg/L. An upgraded ion exchange system, described in Section 3.1.1, will be installed to remove uranium from the mine water.

For removal of radium to below the 30 pCi/LL standard (20.6.2.3103A NMAC), the Mt. Taylor Mine has employed co-precipitation of radium with $BaSO_4$ by adding $BaCl_2$ to the mine water discharging from the sedimentation stage (ponds 1, 2 and 3) of the mine water treatment cycle. This method of radium removal remains BPT and will be used when operations resume. Specific equipment in the radium removal process will be repaired or replaced as necessary, but no technology upgrades will be needed.

To protect wildlife from entry into the below-grade treatment tanks, RGR will install chicken wire barriers around each tank. A covering of similar fencing material will be placed over each tank until mine reactivation, at which time the cover will be removed to provide access for maintenance and operations.

Although the mine water presently shows no selenium above the detection limit, RGR recognizes that selenium concentration in the mine water could increase after mine dewatering resumes. Should the selenium level increase near the 20.6.2.3103 NMAC Standards limit of 0.05 mg/L, RGR will install a selenium-specific resin in one or more of the IX trains in the mine water IX treatment plant (see Section 3.1.1), where excess capacity will be available after the initial drawdown of mine water. Removal of selenium from water using ion exchange is a proven technology in widespread use (North American Metals Council, 2010).

During mining, part of the treated mine water is used on site and part is discharged off site. Treated water is used for general plant water supply and for cooling water in the mine air refrigeration plant. The remainder is then pumped through a 4.3 mile long, 24-inch pipeline and discharged to San Lucas Canyon at Outfall 001 (Section 3.1.5 and Figure 2-2) under authority of NPDES permit # NM0028100. The pipe consists of 1/4-3/8 inch wall thickness steel sections welded in the field.

3.1.1 Ion Exchange

The Mt. Taylor ion exchange (IX) treatment is intended for water quality treatment, not for uranium recovery. The amount of uranium in the mine water is relatively small and not sufficient to support commercial recovery.

In 2007, the New Mexico Water Quality Control Commission (WQCC) promulgated the standard of 0.03 mg/L for uranium discharges in the New Mexico Water Quality Regulations, paragraph (12) of subsection A of 20.6.2.3103 NMAC. To reduce mine water uranium concentrations below the required standard, 0.030 mg/L, (20.6.2.3103 A NMAC), upon return to operating status, the existing ion exchange (IX) equipment will be upgraded and new columns, tanks and resins added within the existing IX building. The ion exchange process for recovering uranium from mine water utilizes a quaternary amine incorporated onto a porous styrene divinylbenzene bead. The amine has the ability to give up anions in exchange for anions in solution, in this case uranium. The resin will be Dow Chemical Company DOWEX 21K 16/20, or an equivalent resin. The DOWEX 21K 16/20 resin is a high efficiency, large bead, strong base anion exchange resin. The selection of the resin was based on field tests conducted by RGR under DP-1712. That testing was completed, and DP-1712 has subsequently been terminated. The upgraded Mt. Taylor IX system (Appendix D) is designed to treat 10,000 GPM of mine water for removal of uranium at 0.07 parts per million (ppm) initially, with trend increasing.

The system will incorporate seven IX trains each consisting of two IX columns in series. Each IX column will have a load consisting of 400 cubic feet of ion exchange resin having a maximum loading capacity of 0.09 pounds of U per cubic foot of resin. Each train has been designed to handle a maximum flow rate of 1,650 gallons per minute (GPM) and will be operated at a nominal flow rate of 1,429 GPM. The individual trains will be sampled and assayed to ensure that the discharge water does not exceed the uranium discharge limits. Given the particular configuration of the IX Plant columns and the flow rate pumped from the mine, engineering models performed by RGR predict the uranium loading in the tail columns will be 3.33% of the lead columns. Assuming that the resin in the lead columns would be loaded to the 0.27 lbs/ft^3, the resin in the tail columns would be loaded to 0.009 lbs/ft^3 U. Mt. Taylor Mine IX Plant engineers expect typical maximum loading of 0.06 lbs/ft^3 in the lead columns and 0.002 lbs/ft^3 in the tail columns.

No special provisions for IX train change-out will be required for the initial high-volume operational phase. The frequency of resin change-out (transfer/refilling) will vary according to flow rate and uranium concentration. Six IX trains will be in operation at one time. The seventh (spare) IX train will be offline for resin change-out. This resin change-out process will require approximately six hours per train.

Once the initial drawdown of mine water is complete and sustained pumping rates are reached, excess IX treatment capacity will make one or more trains available for selenium removal, should selenium levels exceed the 0.05 mg/L standard.

Discharge water from each train will be sampled and assayed to verify compliance with the uranium discharge limit. The samples will be composites drawn over an 8-hour period, and will be assayed daily using KPA (Kinetic Phosphorescence Analysis). KPA achieves highly specific analyses for uranium in water down to 0.01 ug/L (ppb).

The IX columns are designed for transfer of the resin in the lead IX column when it reaches a loading of about 0.06 pound of U per cubic foot, to prevent discharge exceeding 0.030 mg/L U. This resin will be transferred to one of two loaded resin storage tanks and then off-loaded to a resin tanker and transported to offsite facility to be regenerated with a concentrated brine solution in a split elution cycle. The regenerated resin will be returned to Mt. Taylor to be reused.

Each of the IX columns will be operated in an up-flow mode with safeguards to prevent resin leakage between IX columns or resin spills as follows: 1) resin screens in the overflow in each column, 2) a level control system that will reduce the input flow rate to the lead IX column; and 3) a bypass on the tail column will reroute bypass fluid to an overflow storage tank. The fluid sent to the overflow storage tank will be recycled back to the main supply wet well whereby it will be fed to the lead IX column.

The uranium collected at the IX Plant will be in the form of natural uranium (U-nat). The maximum amount of U-nat that could be present at any time in-process and in-storage at the IX Plant is 900 pounds (281.92 millicuries). The maximum loading capacity of the resin is 0.27 pounds of U per cubic foot of resin for a possession limit of 2700 pounds U (845.77 millicuries).

3.1.2 Ponds

The eight ponds of the mine water treatment unit are used to remove solids (sediments and barium sulfate precipitate) from the mine water and to contain and manage the mine water through the treatment process until the water is discharged via the pipeline.

The sizes and shapes of the ponds will be modified to improve management of potential upset conditions, which are addressed in the NPDES, Part III, Section B.5. In addition, Section 3.1.2 and 3.1.4 of this application describe the reconfiguration and improvements in the MWTU pond that will increase operational flexibility for response to upset conditions. Each pond will have a bypass, allowing each to be taken out of service temporarily for repair or maintenance without compromising the MWTU operating capacity. Several hours of surge capacity at 10,000 gpm will be built into Pond #1 to allow for complete suspension of IX treatment for that period of time, if necessary. Note that the IX design has substantial redundancy to account for upset response without interrupting deep well or shaft pumping operations.

During the initial depressurizing phase of operations, when pumping rates will be closest to the treatment design capacity (10,000 gpm), no personnel will be in the mine. During this phase, the deep well pumping can be suspended or reduced if an upset in the MWTU causes the rate of treatment to lag the pumping rate for more than a few hours. Subsequently, after the depressurizing phase is complete, pumping and treatment rates will be reduced to 4000-5000 gpm, or approximately 50% of the design capacity, providing surge capacity within the ponds to store mine water until full function of the MWTU has been restored.

Solids generated by the mine water treatment are excluded from the definition of hazardous waste (40 CFR 261.4(b)(7). Nevertheless, the suspended solids and dissolved contaminants must be contained until removed from the water. In addition to the water quality criteria of 20.6.2.3103 A NMAC, 20.6.2.3109 C(3)(b)(i) NMAC limits effluent discharge from mines to 0.5 acre-feet/acre/year, and 20.6.2.310 C(3)(c)(i) NMAC requires capability for sampling and flow monitoring sufficient to determine discharge to the ground. To achieve these standards, RGR will replace the old liners with new liners, as illustrated in Drawings MT13-AC-02 through -07.

Except for pond #2, the ponds were dry and supported volunteer vegetation at the time of this application. The surfaces of the ponds will be prepared by stripping away existing vegetation and

regrading the pond slopes to not steeper than 3H:1V. Historical data and previous topographic maps indicated total pond system holding capacity of approximately 62 acre-feet (ac ft). With reshaping and addition of liners to the pond, the holding capacity of the pond system will not increase (Appendix B, MT13.04) but will be redistributed toward better surge capacity in ponds #1- #3, upstream of the IX. Some capacity lost in ponds #4 - #8, downstream of the IX, will be recaptured in pond #1- #3 to provide additional space for up to two hours of temporary mine water retention in the event of an upset condition in the IX plant at maximum pumping rate of approximately 12,000 gpm.

To initiate pond upgrades, the base of each pond will be cleared of contaminated sediments, which will be excavated and disposed of in a clay-lined disposal cell in the south waste pile, described in Section 3.2.1. The remaining clean soil surface of each mine water treatment unit (MWTU) pond will be sloped to a corner of each pond.

- Ponds 1, 2, 3, 4, 5, and 8 will have double membrane liner systems that include: Clay underliner of 1.0 feet of locally available sandy clay or clay (Cl, CH soil) or clayey sand (SC soil) compacted to not less than 90 percent Standard Proctor density (ASTM D-698).
- Secondary geomembrane of 40 mil HDPE
- Leak detection and collection layer of 250 mil HPDE geonet
- Primary geomembrane of 60 mil HDPE

Ponds 6 and 7 receive treated water that meets the water quality criteria of 20.6.2.3103A NMAC. Therefore, these ponds will be lined with a single 60 mil HDPE geomembrane. The HDPE geomembranes will meet the specifications of the Geosynthetics Institute's GRI Test Method GM13, Table 1a (GSI, 2011).

On ponds 1-5 and 8, a leak detection and collection system (LDCS) will be installed with the collection sump located in the low corner of each pond. The LDCS of each pond, illustrated in Drawing MT13-AC-06B, will consist of:

- The geonet between the two HPDE geomembranes
- A sump at the lowest corner of each pond, filled with gravel placed at the end of the geonet and between the two geomembranes

- An HDPE pipe extending from the sump bottom to the top of the pond slope between the geomembranes.

Because ponds 6 and 7 will have single-membrane liners, they will not have LCDS.

The LDCS will collect water that leaks through the primary geomembrane into the high-permeability geonet, which then drains the water to the sump, where the HDPE pipe provides access to both monitor and remove water that collects in the LDCS. The LDCS of each pond will be monitored as described in Section 6.

Drawings MT13-AC-03, -03A and -04 illustrate the typical pond liner for ponds 1, 2, 3, 4, 5 and 8. These ponds will contain mine water that is undergoing treatment and, therefore, probably exceeds discharge standards for radium and uranium. Ponds 6 and 7 (Drawing MT13-AC-05) will hold treated water with radium and uranium concentrations below discharge limits, so a single 60 mil HDPE liner will be sufficient to contain this water within 20.6.2.3109 C (3)(b)(i) NMAC limits until it is circulated for use in the mine cooling circuit and mine plant operations or released through the treated water pipeline for discharge.

The HDPE geomembrane will be attached and sealed to the hydraulic control structures in each pond (Drawing MT13-AC-07). Steel or aluminum battens will be used to secure the geomembrane to existing concrete surfaces of the hydraulic structures. Where new concrete will be used to repair or extend the existing hydraulic structures, the geomembrane will be attached to HDPE channel embedded in the concrete. Pipe clamps or concrete collars will be used to seal the geomembrane to large diameter steel pipe inlet structures.

3.1.3 Hydraulic Control Structures

Hydraulic control structures consist of steel and concrete structures that control the movement of water into and out of the mine water treatment ponds (Drawing MT13-AC-02, -07). Each of the ponds has one or more hydraulic control structures. Most of the control structures will require rehabilitation, including repair of concrete and replacement of steel components. Two structures, the inlet works at the east and south of ponds 6 and 7, are no longer needed and will be removed and replaced by two new inlet structures for the bypass pipe around pond 5 (Drawings MT13-AC-02 and -05).

The existing spillways at the inlet structures to the ponds will be removed and replaced with new concrete spillways, formed and poured in place and connected to both the existing hydraulic control structures and the new pond liners (Figure 3-1 and Drawings MT13-AC-06A and -06B).

Concrete surfaces exposed to flowing or standing water will be protected with a coating of water-proof elastomeric polyurethane such as Polibrid 705 or approved equivalent material.

3.1.4 Pond Bypass

To allow each pond to be taken out of service for inspection or repair, a bypass must be provided to route water around the pond without interrupting the function of the mine water treatment unit. A bypass exists around each pond except for pond 5. A new bypass will be constructed around pond 5, connecting pond 4 to ponds 6 and 7 (Drawings MT13-AC-02 and -05). The bypass will be 24 inch diameter steel pipe with separate branches to pond 6 and pond 7.

3.1.5 Treated Mine Water Pipeline

The 4.3 mile long, 24-inch pipeline that coveys treated mine water to San Lucas Canyon at Outfall 001 will be rehabilitated as described in Section 4 but otherwise will remain as originally constructed.

3.2 Waste Piles

3.2.1 South Waste Pile

The existing south waste rock pile covers 11.5 acres in the southwest corner of the mine area. The waste pile contains waste rock from the mine level with above-background levels of uranium and radium as well as waste rock (muck) from shaft sinking and mine development containing background levels of these radionuclides. The latter material is suitable for use as cover soil for waste pile reclamation (see Closeout/Closure Plan, RGR 2013) and will be segregated from the rest of the waste rock.

Upon reactivation of the mine and before ore production resumes, the existing waste pile will be reshaped. The west and south slopes will be flattened to not steeper than 5H:1V to facilitate contemporaneous stabilization and reclamation while waste rock in placed on the eastern (backslope) of the waste pile. The thin wedge of waste rock presently on the east side of the pile (Drawing MT12-CL-08

and -09, RGR 2013) will be excavated and pushed west over the area of thicker waste rock. The ultimate waste pile footprint will lie within 11.5 acres.

During reactivation, uranium- and radium-contaminated sediments from cleanout of the water treatment ponds and storm water ponds will be removed and deposited in a clay-lined cell within the south waste pile. The cell liner will consist of not less than 1.0 ft of compacted clay soil (CL, CH, or SC soils per USCS classification) . The disposal cell will be buried within the waste rock and subsequently covered by the waste pile clean-soil cover. At closeout, a similar cell will be constructed at the top of the waste pile to contain contaminated materials excavated from the ponds. The disposal cells are illustrated in Figure 3-2 and 3-3. A test plot will be developed on the cover of the activation waste cell to:

- provide a site-specific means for evaluating the revegetation interim technical standard (RGR, 2013b, Appendix F)
- demonstrate adequacy of the 2.0 ft. thick cover to support vegetation
- verify radon attenuation performance of the cover with vegetation

As part of the original closeout plan, analyses were performed to determine the structural stability (resistance to mass movement) of the pile after maximum buildout and stabilization. The results of these analyses, documented in Appendix B of the CCP (RGR 2013), show that the minimum factors of safety are 2.42 under static load conditions and 1.61 under pseudostatic (earthquake) load conditions for slope gradients that are steeper than those proposed for the reconfiguration of the existing waste pile. These values are well above the minimums necessary (1.00) to ensure stability. The configuration of the pile reshaped from its present (2013) form will have even higher factors of safety, given the flatter slopes compared to those of the model. Therefore, although there is no concern about structural stability of the existing west and south pile slopes, these slopes will be flattened to not more than 5H:1V to facilitate cover placement, erosion protection, and revegetation for better erosional stability.

3.2.2 North Waste Pile

Although the north waste pile is a future pile that has not yet been constructed, it is included as a unit within the existing mine permit. However, because it will not be started for at least 10 years after reactivation, the north waste pile is a “succeeding unit” (19.10.12.1202 A (2)(b) NMAC).

If needed, the north waste rock pile will be located north of the Mine Water Treatment Unit, as shown on Drawings MT13-AC-01 and -10. The design of the north waste rock pile incorporates provisions that will accomplish closeout of the pile progressively through the operating life of the pile. The pile will be built in 10-foot high lifts to the lines and grades needed for closeout, enabling stabilization contemporaneously with build-out. The north, west, and east slopes of each lift will be built at 5H:1V to facilitate cover placement and vegetation of the side slopes before the next lift is started. The top surface of each lift will slope to the east at approximately 1%. The side slopes of each lift will be covered with 2.0 feet of soil after the lift has reached design configuration, and revegetation seeding and erosion protection for the lift will be accomplished at the same time.

The maximum buildout/ closeout configuration of the new waste rock pile is illustrated on Drawings MT13-AC-10 and -11.

The base of the north waste pile will be excavated into bedrock, which lies at the surface or below a thin cover of alluvial or residual soil. The excavation will extend laterally beyond the toe of the waste pile to create a runoff collection swale around the pile to collect runoff and sediment from the pile. The base of the excavation and the swales will be sloped at natural grade to carry runoff to a storm water retention basin at the west end of the waste pile. This basin will be approximately 700 feet long (N-S) by 100 feet (E-W) with a maximum depth of 10 feet, providing sufficient pond capacity to contain the 100-year storm runoff from the north waste pile. Soil eroded by runoff from the soil stockpile surfaces will be contained within the excavated swales and the retention basin and will not reach watercourses.

A compacted clay liner will be placed across the base of the waste pile excavation and the storm water retention basin. The clay liner will be constructed of one foot of locally available clay (SC, CL, CH soil) compacted to not less than 90% of Standard Proctor (ASTM D 698) dry density to produce a hydraulic conductivity of not more than 10^{-7} cm/sec. .

Analyses were performed to determine the structural stability of the north pile after complete buildout. The results of these analyses, which assumed slopes steeper than the 5H:1V in the current design and separated by benches, are documented in Appendix B of the Closeout/ Closure Plan, (RGR 2013). Those results show that the minimum factors of safety are 2.32 under static load conditions and 1.58 under pseudo-static (earthquake) load conditions. These values are well above the minimums necessary (1.00) to ensure stability.

3.3 Ore Pad

The existing ore pad presently holds approximately 60,000 tons of ore. The existing soil cover will be removed; contaminated soil in the cover will be disposed of on the south waste pile, and clean soil will be returned to the borrow area east of the ore pad. Once the soil cover has been removed, the ore will be removed and shipped off site for milling, and any remaining contaminated soil in the pad will be excavated and placed in the waste pile. The pad will be rebuilt to include a liner and a truck wash facility (Drawings MT13-AC-12 and -13). These upgrades will be made to provide additional protection against release of solid or liquid contaminants from the ore pad, in accordance with BPT per 40 CFR 440.

3.3.1 Liner

The ore pad liner will consist of a 60 mil HDPE geomembrane meeting the specifications of GSI (2011) Table 1a, covered with 1.5 feet of compacted clay or clayey sand fill. This thickness of fill provides adequate support for the largest equipment (assumed to be a CAT 988 loader) used on the ore pad (Appendix B, Calculation MT13.03). A travel course and drainage layer of at least one 1.0 feet of free-draining crushed sandstone or aggregate will be placed over the fill. The entire liner system will be sloped at the grade of 0.01 from east to west to drain runoff to two catch basins located along the west side of the ore pad. The liner will be terminated in an anchor trench within the perimeter containment berm surrounding the ore pad.

3.3.2 Truck Wash Facility

To minimize the potential of release of radiological or hydrocarbon contamination on ore trucks leaving the ore pad, a truck wash facility will be constructed near the southwest corner of the ore pad (Drawing MT13-AC-12). This facility will be designed according to guidance in EPA 816-F-01-024 (U.S. EPA 2001). A touchless rollover wash system will be installed on a concrete deck, at least 30 feet wide and 60 feet long, that drains to a catch basin with an oil separator. All trucks and other equipment used to handle ore, except the muck truck that remains on site, will be run through the truck wash before leaving the ore pad area.

3.3.3 Catch Basins and Discharge Pipe

The wash water and associated sediments from the truck wash as well as the ore pad runoff and interflow will be drained to catch basins. The catch basins will be designed to collect both runoff from the ore pad surface (Appendix B, Calculation MT13.02) and any water that has infiltrated to the geomembrane liner (interflow). Each catch basin will trap and retain sediments so that the size and quantity of suspended sediments in water released from the catch basins will be minimized. One catch basin will be located adjacent to the truck wash near the southwest corner of the ore pad, the other near the northwest corner of the ore pad (Drawing MT13-AC-12). Each basin will be configured to trap sediment and to convey runoff from the ore pad resulting from the 100-year storm (Appendix B). The catch basins will be pre-cast concrete or pre-formed CMP segments selected from vendors' standard designs and assembled in the field.

Water released from each catch basin will drain through the discharge pipe to the ore pad runoff retention pond (previously called the north storm water retention pond) described in Section 3.4.2. The water will discharge from the pipe to that pond through a concrete spillway.

3.4 Surface Drainage and Storm Water Retention Ponds

The existing National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges for Multi-Sector General Permit (MSGP) Activity #NMR05GB27 meets the MSGP General Permit 8.G.1.2 requirements for STORM WATER DISCHARGE, INDUSTRIAL PLANT for Uranium-Radium-Vanadium Ores (SIC 1094) as described in EPA, 2006. This permit is in timely renewal.

The NPDES stormwater permit covers runoff from existing facilities; in the future it will be modified to include the north waste pile before that facility is constructed.

3.4.1 Grading and Drainage

3.4.1.1 Existing Drainage and Flood Potential

The mine water treatment area will be protected from flooding by (1) a major natural drainage system north of the property called Marquez Creek (Arroyo), (2) a secondary man-made diversion ditch which flows to Marquez Creek (flowing northwest) collecting surface runoff from above the mine site and

east of the ore pad, and 3) diversion of the Service and Support area runoff to a culvert discharging to the south storm water retention pond.

Hydrologic analyses using the HEC-1 and HEC-2 models, described in the Closeout/Closure Plan (RGR 2013, Appendix B), show that Marquez Canyon arroyo will convey the 24-hour, 100-year flood without need for erosion protection or channel improvements. These analyses show that the design flood water and energy surfaces are well within the arroyo banks, indicating that there should be no out-of-bank flow during the design flood and that the arroyo morphology appears to be in equilibrium with much larger runoff events. A surface water diversion channel, located east of the 14-foot shaft and ore stockpile areas, intercepts and diverts runoff from the east northward to Marquez Arroyo. The channel is very stable, with substantial amount of rock and vegetation in place, and will be preserved in this condition in closeout. Therefore, no upgrades to surface drainage will be needed for the part of the mine area tributary to the Marquez Arroyo.

Runoff from the mesa slopes east of the south part of the Service and Support area and from the south side of the existing waste pile drains to a secondary diversion ditch (man-made arroyo), which collects surface runoff from above the mine site and flows southwest and west at the south edge of the mine site. An existing storm drain collection system collects surface runoff from the Service and Support area and directs it to the south storm water retention pond for evaporation (Drawing MT13-AC-14). The pre-mining middle arroyo was largely filled in during site construction in the late 1970s and is now covered mostly by the Service and Support area and the south waste pile. Its remnants lead to the south storm water retention pond north of the waste rock pile. The middle arroyo has a very small watershed; therefore, it received little runoff, which has been accommodated with site grading and culverts (Drawing MT13-AC-14).

3.4.1.2 **Drainage Upgrades**

Some minor upgrades will be made to the site grading and drainage plan (Drawing MT13-AC-14).

In the mine water treatment area, surface grading will direct runoff away from the water treatment ponds. Runoff from east of the ore pad that had previously drained to the north storm water pond will be redirected toward Marquez arroyo, where it had previously naturally flowed. Runoff from the mine water treatment area will continue to follow the natural gradient of the ground to the northwest as

sheet flow into Marquez arroyo. The north storm water pond will be renamed the ore pad runoff retention pond and will receive runoff only from the ore pad and truck wash.

Runoff from the north portion of the Service and Support area that presently discharges into pond 2 will be diverted into a new culvert that replaces the existing, east-sloping culvert along the south side of the county road. The new culvert will slope to the west along the south side of the county road to the south storm water retention pond. This culvert (county road culvert) will include two or more manholes to intercept local runoff and reduce the sediment load reaching the south storm water retention pond.

A system of catch basins and connecting culverts will be installed from the east edge of the existing waste pile to the south storm water retention pond (Drawing MT13-AC-14). The catch basins will intercept runoff and trap sediments from the backslope (east face) of the waste pile, and the culvert will route the water to the retention pond.

With the exception of these upgrades, the site drainage will remain as it has been since mine development. Spilled ore and runoff around the 24-foot shaft, where ore spills are concentrated, are controlled by a concrete pad that drains to a sump at the southeast corner of the shaft area, from which the runoff is discharged via a pipe through the utility tunnel to mine water treatment pond #1. Within the rest of the Service and Support area, water drains south to the arroyo or north to the county road, where the new culvert will channel runoff to the south storm water retention pond.

3.4.1.3 **Ore pad runoff retention pond**

The north storm water retention pond will be slightly modified to receive runoff only from the ore pad and truck wash and will be renamed the ore pad runoff retention pond. The pond basin will be reshaped to create uniform slopes at 3H:1V, contaminated sediments will be removed for disposal on the disposal cell in the south waste pile, and a double liner with LDCS, as described in Section 3.1.2, will be installed. A concrete inlet structure with spillway will be constructed on the east side of the pond to control release of runoff from the ore pad and truck wash into the pond. Design of these pond upgrades is shown on Drawing MT13-AC-15.

3.4.1.4 **South storm water retention pond**

The south storm water retention pond receives runoff from the Service and Support facilities area as well as from the existing waste pile. As a result, sediments with elevated levels of uranium and radium have accumulated in this pond. The sediments will be removed and placed in the disposal cell on the waste pile before the pond is reshaped with 4H:1V slopes. Concrete spillways will be constructed at the northeast corner and along the east side of the pond for control of runoff discharging from the county road culvert and the waste pile culvert, respectively (Drawing MT13-AC-16).

After the contaminated sediments have been removed from the pond basin to the waste pile disposal cell, the pond will be enlarged by widening and deepening it, to provide capacity to retain approximately 15 ac-ft, or almost two times the 100-year storm runoff from its watershed (Appendix B, MT13.01). A clay liner will be constructed to provide an adequate barrier to infiltration of pond water into the substrate. Previous studies by Kleinfelder (2012) have shown that there has been no infiltration of water from this pond to the ground water plume emanating from the old sewage lagoon. The data from that study, as well as records of the monitor wells down-gradient from the pond, show that the pond substrate has naturally low permeability.

The liner will be constructed of not less than 1.0 feet of locally available clay (SC, CL, CH) across the bottom and side slopes of the pond compacted to limit the hydraulic conductivity to not more than 10^{-7} cm/sec. The hydraulic conductivity limit can be achieved using soils with clay properties common to on-site soils (Benson and Trast 1995). If necessary, the local clay will be augmented with bentonite to meet this specification. A test fill consisting of selected clays, and additives if needed, will be constructed, then tested using an infiltrometer.

4 MINE FACILITIES REHABILITATION

RGR has employed staff, under the direction of its mine manager, to maintain the mine facilities during standby. With the exception of the mine unit underground workings and wells, the mine water treatment system, and some components of the Service and Support unit (e.g.; the sanitary treatment plant, or STP), the mine facilities have been maintained in operating condition. Mine facilities not kept operational during standby will require rehabilitation including:

- *The treated water discharge pipeline* will be lined with an HDPE liner manufactured specifically for this purpose by United Pipeline Systems. The liner has small channels in its outer surface to intercept and direct leakage through the liner to points of collection along the pipeline. This liner will reduce the cross section of the pipe interior slightly but will also reduce pipe wall roughness, thereby reducing friction while also protecting the pipe steel. No substantial change in pipe flow capacity is expected.
- *The sanitary treatment plant (STP)* will be rehabilitated to its original configuration and operating condition with replacements of parts and equipment as necessary. No modifications that "will change substantially the quantity or quality of the discharge from the system" (20.6.2.1202 NMAC) will be made.
- *Electrical and mechanical systems* will be replaced or repaired as needed. The specific repairs will be identified by serviceability surveys of all electrical and mechanical equipment when the mine permit has been revised and a detailed schedule for mine restart has been developed.
- *Shaft liners* for both shafts have been examined by downhole video camera in 2007 and appear to be in good condition. However, direct inspection to determine the structural condition of the liners cannot be performed until mine dewatering resumes and water levels in the shafts drop enough to allow direct access. Both shafts have cast-in-place reinforced concrete liners from collar level to mine level. The liner thickness increases with depth, from 1.0 feet at subcollar level to 3.0 feet at mine level. The rock/ concrete interface is pressure-grouted through the saturated section from the Point Lookout aquifer to the shaft stations at mine level, isolating the shafts from the aquifers above mine level and the aquifers from each other. Direct inspection will include visual examination and physical testing of the liners as needed to ascertain the structural integrity and water barrier performance.
- *Vent coverings,* for protection against entry by wildlife, will consist of hardware cloth covers applied to those vents and other openings where such measures will not compromise the functions of those openings or safety of personnel in the impacted work spaces.

5 OTHER PERMITS AND REGULATIONS

In addition to the Mine Permit #C1002RE and Discharge Permit DP-61, other permits and regulations are relevant to the reactivation of the Mt. Taylor Mine. The permits are listed in Table 5.1. These permits and the applicable regulations are described below.

5.1 Radioactive Material License

A license is required by 20.3.3 NMAC for certain types of radioactive material associated with the mine, including uranium removed from mine water by the Ion Exchange (IX) plant water treatment circuit. RGR has a radioactive materials license (SO043) issued by the New Mexico Radiation Control Bureau.

5.1.1 Renewal of the Existing License

RGR's existing license authorizes possession and use of Cesium-137 and Radium-226. These radionuclides are used to calibrate instruments that are used for radiation monitoring and ore assays. This license was renewed on November 20, 2012 for a five-year period ending on December 31, 2017.

5.1.2 Application for Amendment

An application for amendment to License SO043 has been submitted to the New Mexico Radiation Control Bureau to include authorization of the IX plant and the handling of uranium that it will remove from the mine water. This application includes:

- basic engineering drawings that show facility processes in addition to estimates on the maximum quantity (mass) of uranium to be possessed,
- description of IX plant operation and radiation safety processes,
- revisions and additions to the radiation safety program, and
- explanation of plans to transfer uranium-bearing resin from the IX plant to persons authorized by NRC or Agreement States to receive such material.

5.2 Air Quality

No air quality permits will be required for reactivation and operation of the Mt. Taylor Mine. However, the mine will be required to comply with the emissions standards, recordkeeping, and reporting requirements for Ambient Air Quality Standards (AAQS) and for National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for uranium mine radon emissions.

5.2.1 AAQS Criteria Pollutants

Mt. Taylor Mine will be required to comply with the AAQS under EPA and NMED regulations. These agencies have set AAQS for "criteria pollutants" (40 CFR 50 and 20.2.3 NMAC), listed in Table 5.2, that do not include radionuclides. During operation, Mt. Taylor Mine will evaluate emissions of AAQS criteria pollutants and ensure that the corresponding limits are not exceeded. Upon request by NMED, records must be kept pursuant to 20.2.5.108 NMAC and semiannual reports must be made pursuant to 20.2.5.109 NMAC.

5.2.2 Airborne Dusts and Particulates

RGR will practice dust control on waste and ore piles by minimizing the size of exposed surfaces, consistent with operational limits, or by application of surfactants. Dust will be controlled in working areas and roads by watering, surfactants, and speed limits.

5.2.3 NESHAPS for Radon Emissions from Underground Uranium Mines

Mt. Taylor Mine will be required to comply with the provisions of 40 CFR 61 Subpart B, National Emission Standards (NESHAPS) for Radon Emissions from Underground Uranium Mines. This regulation does not impose permit or fee requirements; however, it stipulates provisions for designation of facilities, definitions, standard for compliance, determination of compliance, recordkeeping, and annual reporting. The standard is radiation dose-based at 10 millirem per year to the maximally exposed member of the public [40 CFR 61.22]. Compliance is determined using EPA's COMPLY-R computer code. [40CFR 61.23(a)] (EPA 1990). Reports must be submitted annually to EPA (40 CFR 61.24).

5.2.4 Source Modification

As defined by subsection P of 20.2.72.7 NMAC, "modification" means any physical change in, or change in the method of operation of, a stationary source which results in an increase in the potential emission rate of any regulated air contaminant emitted by the source or which results in the emission of any regulated air contaminant not previously emitted. The Mt. Taylor Mine is an existing stationary source.

An NMED Part 72 construction permit is required if, as a result of the modification, facility emission rates could exceed 10 pounds per hour or 25 tons per year of the AAQS criteria pollutants

[20.2.72.200.A(2) NMAC]. Tentatively, no modifications are planned that will result in such quantities of criteria pollutant emissions being emitted by mine operations. If such modifications subject to 20.2.72.200.A(2) are needed in the future, Mt. Taylor Mine will:

- do case-by-case potential-to-exceed (PTE) assessments to determine whether the emissions thresholds will be exceeded, thus requiring a Part 72 construction permit;
- file notice of intent in accordance with 20.2.73.200.A(2) NMAC if the modifications will result in a potential emission rate greater than 10 tons per year of any regulated air contaminant or 1 ton per year of lead; and
- keep inventories of criteria pollutants if annual emissions exceed 10 tons total [20.2.73.300.A(3) NMAC], and will submit annual reports to NMED if annual emissions exceed 100 tons [20.2.73.300.B(1) NMAC]. It is understood that NMED may require annual reporting even if annual emissions do not exceed 100 tons [20.2.73.300.B(4) NMAC].

5.2.5 AAQS Criteria Pollutants

Radionuclides are not listed as AAQS pollutants. In addition, the EPA Administrator has not determined that radionuclide-only emissions constitute a “major source” that would precipitate NMED source modification permitting in accordance with 20.2.72.200.A(6) NMAC. Vehicle exhaust emissions during facility source reconfigurations are exempt per 20.2.72.202.A(3) NMAC.

5.2.6 NESHAP Regulations

Regulation 2.2.72.202.C NMAC specifically excludes modification permits at facilities subject to, and that comply with, the notification requirements of 10 CFR 61. Radon emissions during mine operation must comply with the 10 CFR 61 Subpart B, NESHAP; hence, radon exhausted by the mine is not subject to the source modification requirements of 20.2.72 NMAC.

5.2.7 Part 70 Operating Permits

According to 20.2.70.202.A(3) NMAC, a facility is not required to obtain a Part 70 “Title V” operating permit solely because of radionuclide emissions. In addition, the EPA Administrator has not determined that radionuclide-only emissions constitute a “major source” that would require Title V permitting. Therefore, at the current time, there are no major source categories of radionuclide emissions listed by

EPA. Although a Part 70 operating permit will not be required, Mt. Taylor Mine will nevertheless need to comply with EPA and NMED ambient air quality standards (AAQS) and the 10CFR61 uranium mine radon NESHAP.

5.3 NPDES for Mine Water Discharge

RGR has an existing National Pollution Discharge Elimination System (NPDES) permit, #NM0028100, issued by the US EPA and authorizing RGR to discharge from Mt. Taylor Mine through the treated mine water pipeline to outfall #001 in an arroyo located in San Lucas Canyon in McKinley County and tributary to the Rio Puerco. This permit became effective on August 1, 2010 and will expire on July 31, 2015. The permit sets limits on specific pollutants in the water including total suspended solids (TSS), radium, uranium, molybdenum, and selenium. The water withdrawn from the mine historically met the then-existing discharge limits. It would meet the current discharge limits with the exception of those for radium and uranium. The mine water treatment unit targets those two contaminants so that water released from ponds 6 and 7 will satisfy the NPDES water quality requirements before entering the pipeline.

NPDES permit #NM0028100 also authorizes RGR to discharge treated sanitary wastewater from the STP at Inter Outfall OIA, which is the connection of the 6-inch STP discharge pipe with the 24-inch treated mine water pipeline. The permit sets limits of this discharged water for pH, TSS, and biochemical oxygen demand (BOD).

5.4 NPDES for Stormwater Discharges

The existing National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges for Multi-Sector General Permit (MSGP) Activity #NMR05GB27 was issued by the EPA to the Mt. Taylor Mine in response to RGR's Notice of Intent (NOI) in 2008. The NOI meets the MSGP General Permit 8.G.1.2 requirements for STORM WATER DISCHARGE, INDUSTRIAL PLANT for Uranium-Radium-Vanadium Ores (SIC 1094) as described in EPA 2006. This permit expired in September 2013 and is in renewal at this time.

Upgrades to site drainage described in Section 3.4 were addressed in the application for renewal of #NMRO5GB27. The buildout of the existing (south) waste pile and additional drainage controls were

covered in the renewal. However, the new (north) waste pile will not be started during the next renewal period; it will be included in a later renewal if the new waste pile is needed.

The Stormwater Pollution Prevention Plan (SWPPP) for MSGP #NMR05GB27 will be updated to account for the upgraded surface drainage and runoff controls, described in section 3.4.1., before construction of these upgrades begins.

5.5 USDA Special Use Permit

The US Forest Service issued Special Use Permit #MOT220 to the Mt. Taylor Mine for the 3.35 acres, and/or .01 miles in Sec. 12, T. 13 N., R. 8 W for transport of mine discharge water where the mine water discharge pipeline crosses Cibola National Forest. The permit expires on 12/31/2028.

5.6 Solid Waste Landfill Registration

The Solid Waste Bureau of NMED granted a solid waste landfill registration to the Mt Taylor Mine for mine waste disposal on site in the existing south waste pile. There is no expiration of this registration and no renewal required.

5.7 Dam Permits

A surface water impoundment structure (dam) comes under the jurisdiction of the New Mexico Office of the State Engineer (19.25.12 NMAC) if it:

- Is 25 feet or greater in height and impounds more than 15 acre-feet of water, or
- impounds 50 acre-feet or more of water and is 6 feet or greater in height.

None of the mine water treatment ponds or storm water retention ponds meets these criteria. Therefore, no permits from the Office of the State Engineer will be required for dams.

5.8 Water Rights

RGR has sufficient rights to divert and use water in amounts necessary to support all mine dewatering and mining activities. RGR has the right to continue to dewater the mine in the amounts and locations of prior dewatering activities which commenced prior to enactment of the Mine Dewatering Act. In addition to the right to dewater the mine (which alone does not require or establish a water right), RGR also has rights to divert and use water based on Declarations filed by RGR's predecessors in 1977 and 1978 (B-516 and B-516(1)). RGR plans to utilize some or all of the water rights declared and established under B-516 and B-516(1) as may be necessary to support mining operations.

RGR will work with the Office of the State Engineer (OSE) to ensure full compliance with all applicable OSE rules and regulations. At this time RGR does not anticipate any changes to its existing water rights necessary to support mining operations.

6 ENVIRONMENTAL MONITORING

6.1 Radiological Monitoring

In 2012, the Mt. Taylor Mine resumed its routine radiation safety environmental monitoring program. Seven initial monitoring locations, shown on Figure 6-1, were established. A radon track-etch detector and a gamma radiation dosimeter are located at each station and will be exchanged and analyzed every three months. The data are used to monitor public and worker radiation dose.

Gamma radiation surveys have been performed routinely on the surface of the Service and Support area. In 2012, gamma radiation and contamination surveys were performed inside the buildings. These surveys will continue after startup with gamma surveys performed at least monthly and contamination surveys performed at least weekly. Contamination surveys will be performed in buildings and underground lunch rooms. The radiation and contamination surveys are (will be) used as a part of the radiation safety program to monitor radiation dose and to control intakes of radioactive materials.

At the restart of operations, air monitors will be utilized at the mine and the mine vicinity to evaluate airborne radioactivity from particulate matter (i.e., ore dusts). The monitoring and analysis for intake of respirable particulates will use methods consistent with Nuclear Regulatory Commission (NRC) guidances such as Regulatory Guides 4.14, 8.34, and 8.37.

The airborne radioactivity monitoring will consist of continuous and grab samples using filter media on calibrated air samplers (pumps). The filters will have high efficiency for removal of sub-micron particles. The guidance in ANSI/HPS N13.1-1999 (section 6.6.2 Filter media) will be followed in using the filter media. Particulate collected on the filters will be analyzed for radioactivity per unit volume of air. Analysis will be performed at the mine Rad Lab using alpha-beta radiation bench counters.

Radiation dose will be estimated using the derived air concentrations (DAC) and annual limits on intake (ALI) for natural uranium given in 20.3.4.461 NMAC.

6.2 Air Quality Monitoring

Although no air quality permits will be required for restart and operation of the Mt. Taylor Mine, the ambient air quality (NMED) and radon discharged by the mine (EPA) will require evaluation or monitoring, recordkeeping, and reporting to the respective agency. Refer to Section 5.2 for explanation.

Emissions of Radon-222 to the ambient air from underground uranium mines are not allowed to exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 millirem per year (mrem/y). Data collected from mine exhaust monitoring will be used in EPA's COMPLY-R code to compute radiation dose to demonstrate compliance with this requirement.

Radon ventilated from the mine will be monitored in accordance with the NESHAP requirements of 40 CFR 61.23(a). Monitoring protocols will be based on section 1 of Method 115 in Appendix B of 40 CFR 61. The radon concentrations exhausted will be monitored continuously inside the duct at the base of the exhaust stack.

Method A-6 of Method 114 in Appendix B of 40 CFR 61 will be used for the analysis of Radon-222. Radon-222 is measured directly in a continuously extracted sample stream by passing the air stream through a calibrated scintillation cell. Prior to the scintillation cell, the air stream is treated to remove particulates and excess moisture. The alpha particles from Radon-222 and its decay products strike a zinc sulfide coating on the inside of the scintillation cell producing light pulses. The light pulses are detected by a photomultiplier tube which generates electrical pulses. These pulses are processed by the system electronics and the read out is in picocuries per liter (pCi/L) of Radon-222.

As an alternative, the use of test method A-7 of Method 114 may be requested to EPA. Using this method, Radon-222 is measured directly in the air exhaust stream using alpha track detectors (ATD). Alpha particles emitted by Radon-222 and its decay products strike a small plastic strip and produce submicron damage tracks. The plastic strip is placed in a caustic solution that accentuates the damage tracks which are counted using a microscope or automatic counting system. The number of tracks per unit area is correlated to the radon concentration in air using a conversion factor derived from data generated in a radon calibration facility. The ATD will be provided and analyzed by an EPA-certified vendor laboratory. Results will be provided by the lab in units of picocuries per liter (pCi/L).

6.3 Mine Water Discharge Monitoring

Monitoring of water discharged from the mine will resume when the mine water treatment system upgrades are complete and mine dewatering commences. Testing and reporting of discharged mine water quality are addressed in NPDES permit #NM0028100. Water quality limits for discharged mine water after treatment, as well as related reporting requirements, are addressed in Parts I and II as well as Sections B, C and D of Part III of the NPDES permit and in section 5.3 and section 6.3 of the Application. The MPO will include these requirements. Table 6.1 lists the water quality standards (for both DP-61 and the NPDES permit) that will apply. Treated water testing will be performed for each of the constituents in Table 6.1, and testing will be in accordance with the requirements of DP-61 and 20.6.2.3103 NMAC. Testing will use procedures described in:

- "Methods for Chemical Analysis of Water and Waste", EPA
- "Annual Book of ASTM Standards. Part 31. Water"
- "National Handbook of Recommended Methods for Water-Data Acquisition", USGS

During treatment of the mine water to remove uranium by IX, Kinetic Phosphorescence Analysis (KPA) will be used to measure uranium concentrations in the IX discharge, as described in Section 3.1.1. Radiation safety related training is provided to all individuals, including KPA technicians, whose assigned duties directly involve radiation and/or radioactive material or whose duties require operation of radiation detection and analytical equipment. The scope of the training is commensurate with worker duties and responsibilities and the equipment used. All technicians using the KPA will successfully complete training before assuming KPA operating duties.

Sampling will be performed at the IX trains as well as at a location representative of Outfall 001 listed in NPDES permit number NM0028100. Each IX train will be sampled individually at the discharge of the tail column. Three 8-hour composites per day from each train will analyzed. To comply with NPDES permit number NM0028100, one grab sample per day will be taken upstream of the Outfall 001. NPDES samples will be submitted on a weekly basis to the third party assay laboratory for analysis.

RGR will also sample the treated mine water for the parameters and at the frequencies listed in Table 6.1. Under NPDES Permit #NM0028100 (Appendix C), Part 1 Section A.1, RGR will sample and test daily the treated water discharging at outfall 001 for radium, uranium, a suite of metals, pH, e. coli, TSS, and COD and quarterly for whole effluent toxicity (Table 6.1). Sampling of the mine water discharge for water quality monitoring is accomplished with an EPA-approved Collins Model 42 automatic sampler, which provides an automatic flow-weighted, measured water sample for a 24-hour period.. The sample system is complete with a refrigeration box to keep the sample temperature at 4 degrees centigrade. This sampler is located in the mine yard where security and electrical power allows taking a truly representative sample. A second Horizon Sampler is available for use when the Collins Sampler is pulled out for repair or routine maintenance.

The parameters specific to the discharge from outfall 01A, sampled by the Collins sampler, are tested with the following preferred methods:

pH – EPA Method 150.2; ATSM D5128

Flow – Venturi or turbine meter

Total Suspended Solids – ASTM D5907

BOD – EPA Method 405 1

The parameters are measured and recorded daily.

The discharge volume is recorded at the mine water discharge point, outfall 001, at Latitude 35° 24' 00", Longitude 107° 38' 24", located approximately 4.3 miles north of the mine site where the 24- inch pipeline discharges into an unnamed arroyo, thence to San Miguel Creek. Other than the three monitoring wells installed in 2013 downstream of Outfall 001 (see Appendix E), no wells are located

within a mile of this outfall. The discharge volume is recorded on a circular Foxboro recorder activated by an in-line annubar tube. These flow records will be retained for five years.

6.4 Pond Leak Detection Monitoring

Mine water treatment ponds 1-5 and 8 and the ore pad runoff retention pond will have double liners with leak detection and collection systems (LDCS) described in section 3.1.2. Each LDCS has a riser pipe through which water that has leaked through the primary liner can be measured and collected. Using a water depth meter and mobile submersible pump, RGR will determine the depth of water collected in the sump of each pond. Based on its size, each pond will have an Action Leakage Rate (ALR), as defined in 40 CFR 264.222 as "the maximum design flow rate that the leak detection system can remove without the fluid head on the bottom liner exceeding 1 foot". The ALR, in units of gallons/acre/day, is the maximum leakage that can occur before the 1.0 foot of head is exceeded and pumping of water must begin to remove the water and return it to the pond. ALRs for each pond are listed in Table 6.2. If leakage measurements indicate that the leakage rate exceeds the capacity of the pumping system, RGR will identify and repair leaks or upgrade the pumping system within 30 days.

RGR will measure the leakage rates of each pond weekly and will maintain written records of leakage rates versus ALRs of ponds 1-5 and 8. As part of the annual reporting requirements under DP-61, RGR will submit a written record of the leakage rates. Ponds 6 and 7, containing treated water, will have single liners with no LDCS, so no leakage measurements will be needed for these ponds.

6.5 Ground Water Monitoring

6.5.1 Ground Water Conditions

Ground water at the Mt. Taylor Mine is described in Section 2.2, the Closeout/ Closure Plan (RGR 2013b), the Site Assessment (RGR 1994a), the original mine permit application (RGR 1994b), and the Waste Pile Characterization Report (Kleinfelder 2012).

The alluvium is generally thin and unsaturated over most of the mine site. Alluvial ground water is limited to the perched water that emanated from the buried waste lagoon under the waste pile and possibly some isolated, spring-fed locations in paleochannels at the alluvium/bedrock contact at 30-60 feet.

The perched zone plume has been investigated for uranium contamination, which is currently being addressed in an NMED-approved abatement plan (Metric 2010). The abatement plan is applying phytoremediation using Salt Cedar trees to remove contaminants from the perched water plume and includes continuing monitoring of ground water levels and contaminant concentrations in monitor wells MW-5, WP-5, WP-4, and MW-4 down-gradient from the existing waste pile and MW-6 in the waste pile.

No ground water wells have been developed in the alluvium within or close to the mine surface area. Shallow, low-volume aquifers in the Upper Menefee produced water to domestic wells in the village of San Mateo, southwest of the mine, prior to mining (RGR 1994a).

The shallowest ground water aquifer below the mine is the Point Lookout Sandstone in the Lower Menefee at approximately 650 to 800 feet depth with a potentiometric surface at a depth of approximately 500-600 feet below the surface. This sandstone unit is separated vertically from the surface and alluvium by several hundred feet of east-dipping shale and sandy shale sequences in the Upper Menefee, minimizing the possibility of any seepage water reaching the Pt. Lookout aquifer. Similarly, Point Lookout is separated from the aquifers below it by hundreds of feet of shale, providing hydrologic isolation for this drinking water from the mine water. Stage 1 depressurizing watering wells and the mine drinking water wells are completed in the Point Lookout. Stage 2 and 3 depressurizing wells are completed in other, deeper aquifers down to and including the Westwater.

The mine shafts have been constructed to protect isolation of aquifers. The hydrologic isolation of the shafts and the mine water from the Point Lookout aquifer is demonstrated by the difference in 2012 static water levels between the shafts and the Phase I dewatering wells in the Point Lookout aquifer; the shaft water levels are 820 feet below ground surface, or about elevation 6520, versus the water elevation of about 6780 in the Phase I wells in the Point Lookout aquifer. After 23 years without dewatering, this water level difference of 260 feet over a distance of 200-400 feet shows that there is no measurable hydrologic connection between the mine water (Morrison/ Recapture/Westwater) and the Point Lookout. Any connection would have equalized the water levels in the mine shafts to those in the Point Lookout by flow from the Point Lookout to the shafts during the time since pumping stopped. The isolation of mine water from the Point Lookout is also evident from the contrast in water quality between the mine water sampled in the 24-foot shaft and the Point Lookout water sampled in well 2A (Table 6.3).

6.5.2 Ground Water Monitoring Plan

Upon revision of the mine permit to active status and through the initial dewatering phase of reactivation, during which no ore production will occur, ground water monitoring will incorporate:

- monitoring of the water levels and water quality in wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6 and WP-4 and WP-5 in accordance with the Stage 2 abatement plan,
- quarterly water levels of depressurizing wells
- discharge rates from depressurizing wells to the mine water treatment system, recorded daily and reported quarterly.

6.5.2.1 Alluvial Ground Water Monitoring

Investigations on the mine site performed over the years through 2012 (RGR 2012; Kleinfelder 2012; RGR 1994a; NMEI 1974) indicate that alluvium forms a discontinuous, thin veneer over residual soil and rock of the east-dipping Menefee shales and interbedded sandstones (RGR 2012, Figure 2-1). The alluvial soil cover is thin or absent over most of the mine site. Shallow alluvial ground water occurs only in the paleoarroyo that lies below part of the Service and Support area and the existing waste pile. The underlying Menefee strata are unsaturated above the Pt. Lookout at 700-800 feet depth. Therefore, there is no ground water that could be potentially impacted by leakage from the mine water treatment ponds (20.6.2.3108 F NMAC).

The alluvial monitor wells already in place (MW and WP series) span the width of saturation in the paleoarroyo; therefore, no additional shallow monitor wells are needed. Upon resumption of ore production, quarterly ground water monitoring will be continued in wells MW-5 WP-5, WP-4, and MW-4 after completion of the abatement plan to detect and evaluate infiltration of storm water from the south storm water retention pond into the alluvium. The target water quality parameters to be tested are uranium, radium, selenium, chloride, and sulfate.

In the mine water treatment unit (MWTU) area, the Menefee strata are exposed or subcrop below a thin soil cover. Therefore, no shallow ground water exists in the vicinity of the treatment ponds, and no monitor wells will be needed. If the pond leak detection monitoring (Section 6.4) indicates that hydrostatic head on the secondary liner of a pond is continually exceeding the Action Leak Rate criterion despite corrective measures, tensiometers with pressure transducers would be installed down-gradient

from the pond(s) where such leakage is occurring. The tensiometers would be used to monitor the pressure potential at various depths in unsaturated soils. These measurements would be used to calculate the pressure gradient with depth in order to assess whether pond leakage is penetrating the surrounding ground and if water is moving up or down in the soil profile. These findings would support a decision about what, if any, corrective actions should be taken.

6.5.2.2 **Deep Aquifer Ground Water Monitoring**

During the initial dewatering phase of reactivation, water levels in the deep wells will be changing rapidly. RGR will measure the water levels in the mine shafts at least quarterly until the drawdown target levels have been reached. Water levels will be measured by pressure transducer, manual sounding or galvanometer and recorded in the site database.

Ground water removed from the bedrock aquifers to depressurize and dewater the mine will be routed directly to the mine water treatment unit, where it will be treated to remove uranium and radium. Discharge of the treated water is regulated under NPDES #NM0028100, which requires water quality sampling and testing as described in Section 6.3. Ground water quality and monitoring requirements contained in 20.6.2.3103A and 20.6.2.3107 NMAC, and necessary to satisfy monitoring requirements of DP-61 for mine water discharges, will be combined with those required by the NPDES permit to constitute a single, unified monitoring program (Table 6.1).

An updated water quality baseline for the mine water will be established upon initiation of pumping of the deep (phase 3) wells, at which time samples will be taken and tested for the parameters listed in Table 6.1.

At least two rounds of quarterly sampling and testing are expected before baseline concentrations can be established. When the updated baseline of these constituents has been determined, RGR will submit its plan for adjustments, if any, to the sampling frequency of treated mine water.

6.6 Sanitary Treatment Plant Discharge Monitoring

The quality of STP unit effluent will be monitored for three parameters on a monthly basis. A 24-hour sample and a grab sample will be taken each month for analysis of NPDES-reported parameters by a contract laboratory. The volume of water exiting from the sewage treatment units will

be recorded with a Badger meter controlled by a Model ML-MN transmitter and float assembly. The monthly sample at the STP unit will be composited with a Horizon Masterflex sampler equipped with a timer for intermittent continuous sampling. Under NPDES Permit #NM0028100 (Appendix C), Part 1 Section A.2, RGR will sample and test daily for pH, TSS, and BOD.

7 OPERATIONS AND HEALTH AND SAFETY PLANS

RGR will update and consolidate the original plans, created by previous owners, which addressed operation of various mine units and will be used by RGR to produce a comprehensive Mine Plan of Operations (MPO). The MPO is not required by MMD for the mine permit revision or by NMED for the discharge permit modification but will include relevant portions of the mine permit and discharge plan. The MPO will be developed for RGR's use in management of mine operations when the mine returns to active status.

RGR's mine health and safety protocols will be updated to comply with 19.6.3 NMAC (Mine Safety for Underground Workers) and current federal Mine Safety and Health Administration (MSHA) under 30 CFR 57 and other applicable New Mexico State Mine Inspector regulations and guidelines.

8 SCHEDULE

RGR intends to initiate reactivation of the Mt. Taylor Mine upon approvals of the mine permit revision to active status and the modification and renewal of DP-61, both of which are expected in 2014. When these approvals are received, RGR will begin the procurement process for long-lead equipment, specifically the shaft hoists and the depressurization pumps. RGR will also begin the detailed design and procurement for mine water treatment pond liners, hydraulic control upgrades, and site drainage and storm water controls (culverts and manholes).

Mine water pumping and treatment facilities will be the first to be placed in operation. Design and procurement for these facilities will begin upon obtaining a mine permit revision and a discharge permit modification, and construction will begin within one year of those approvals. Dewatering sufficient to enable access to the underground workings is expected to take 2-3 years.

When the shafts are accessible, RGR will begin rehabilitation of the shafts and activation of the hoisting and ventilation systems. One to two years of this work will overlap the initial dewatering period so that

the mine should be ready for entry and rehabilitation of shaft stations and primary drifts approximately 4-5 years after permit revision/ modification. Ore production will begin as soon as possible thereafter.

9 CLOSEOUT AND CLOSURE PLAN

The Closeout/ Closure Plan (CCP) submitted in July, 2012 (RGR 2012) has been revised to incorporate the ultimate buildout configuration, described in the original closeout plan (RGR 1998), with the existing conditions and updated technical and regulatory requirements represented in the July 2012 submittal. This revised CCP (RGR 2013b) was prepared under separate cover and has been submitted with this revision application.

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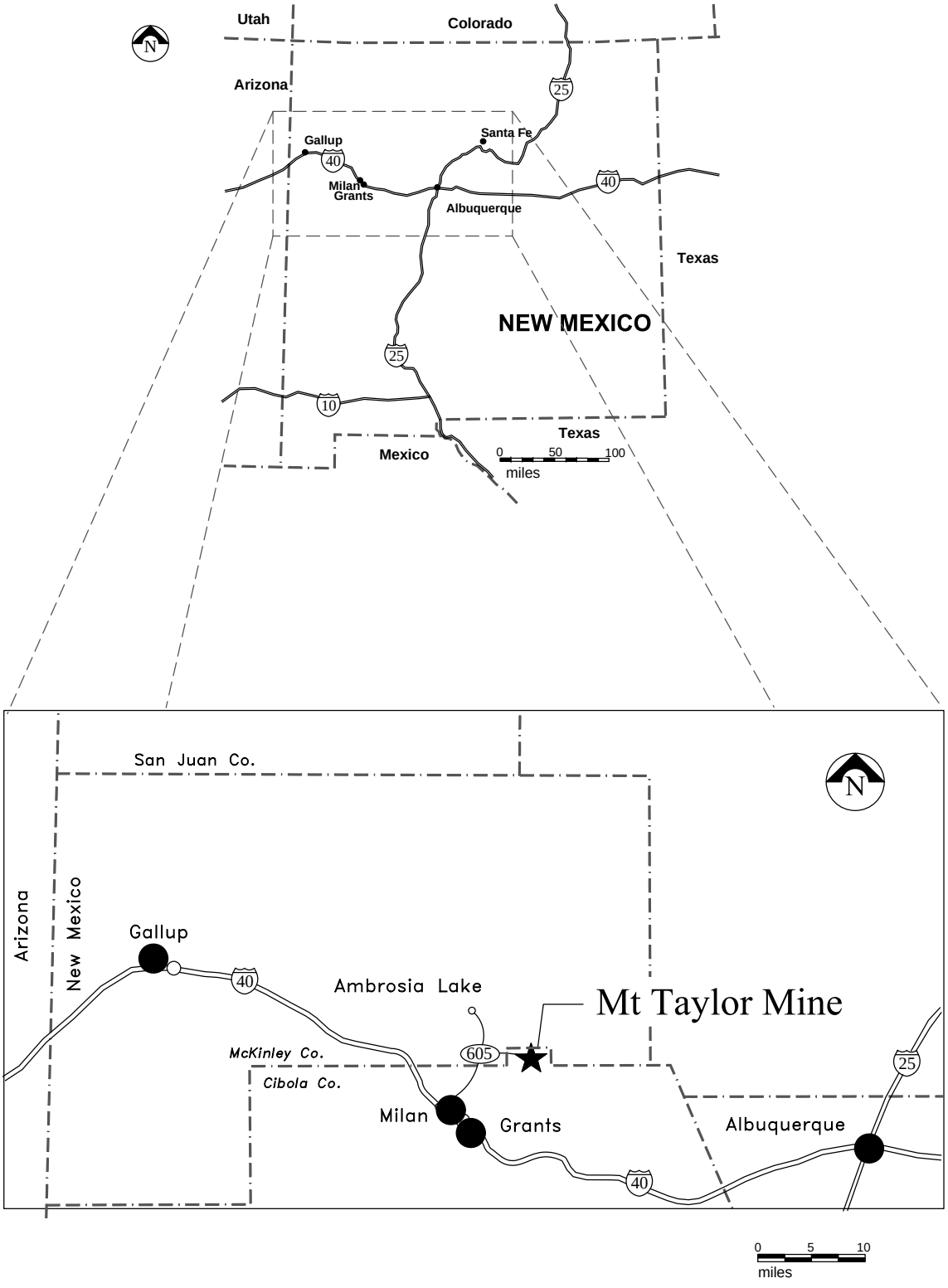


RIO GRANDE RESOURCES CORPORATION

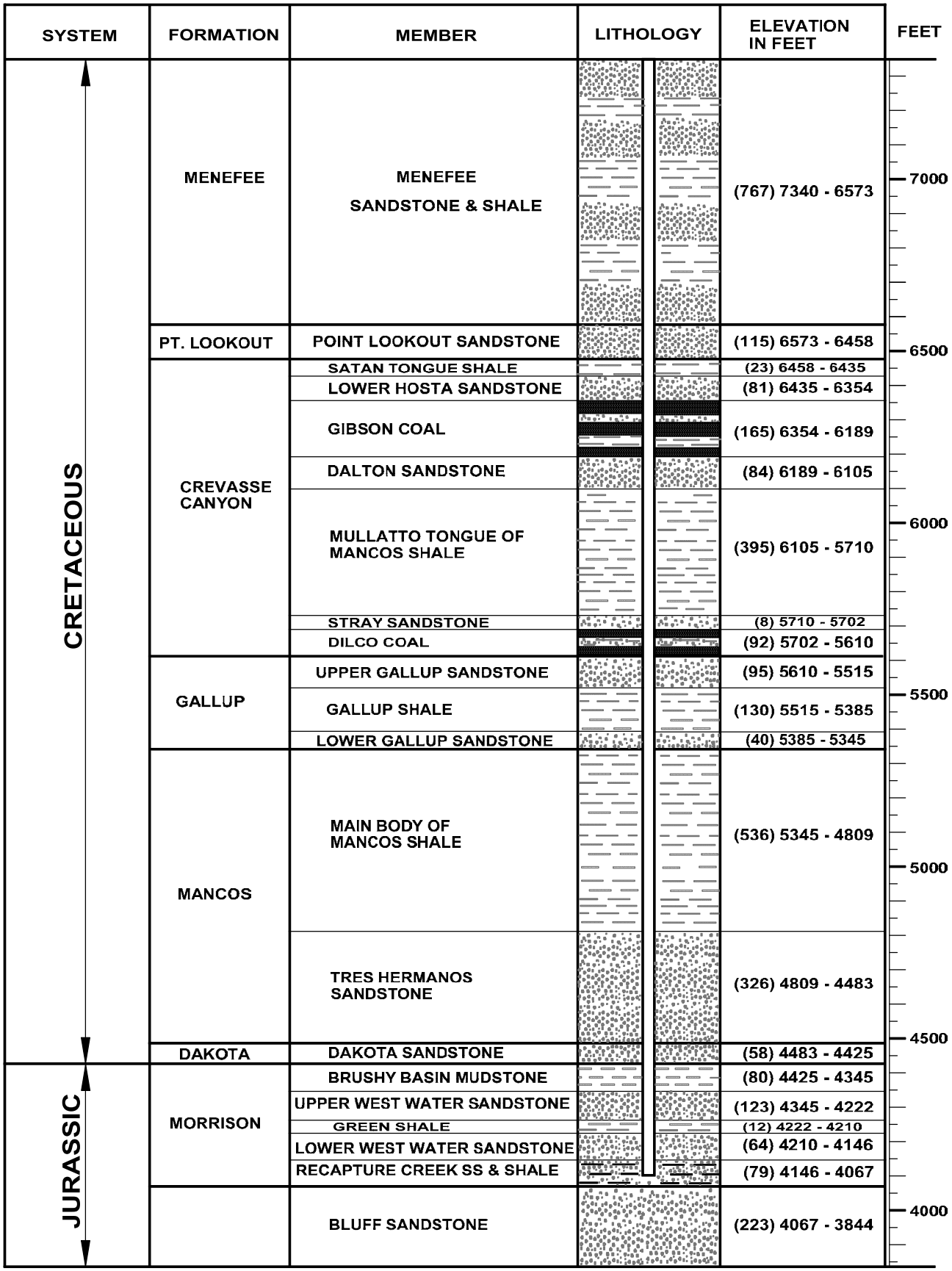
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By:

Alan Kuhn Associates LLC

FIGURE 1-1

Site Location Map



RIO GRANDE RESOURCES CORPORATION

MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By:

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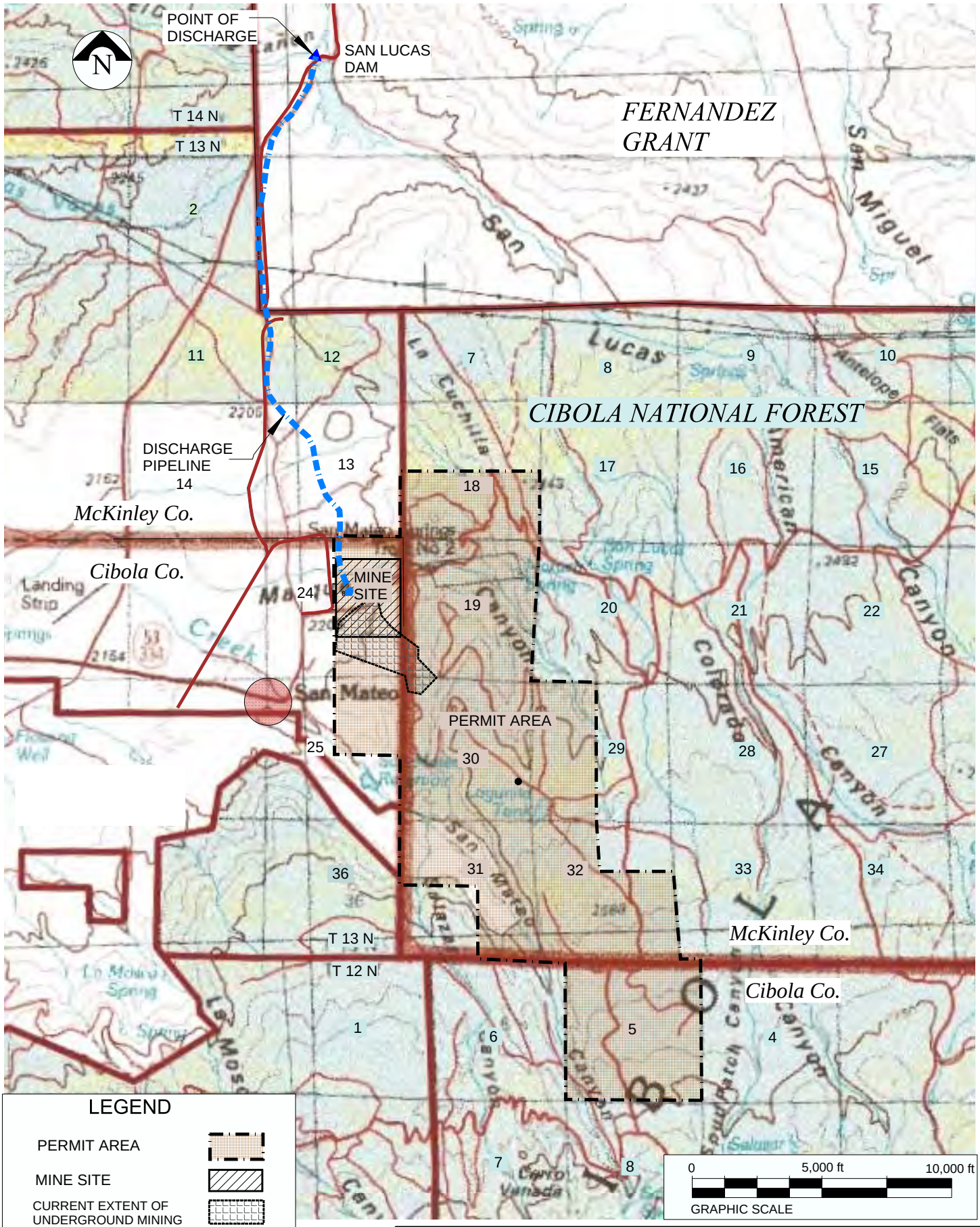
FIGURE 1-2

Geological Section



RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC

DATE: 10/22/13

FIGURE 1-3

MINE PERMIT AREA

DEEP WELLS INFORMATION TABLE

Well No.	Closure Disposition (3)	State Plane Coordinates (NAD 83)		Collar Elevation, Feet AMSL	Depth, Feet from Surface	Depth, Feet Elevation AMSL	Screened Interval, Feet Depth (5)	Screened Interval, Feet Elevation (5)	Aquifer in Screened Interval (6)	Pt Lookout		Westwater	
										Top Depth/ Elevation	Bottom Depth/ Elevation	Top Depth/ Elevation	Bottom Depth/ Elevation
		N	E										
DW 1	PMLU	1579419	2782626	7340	1118	6222	740-890	6600-6450	PL	740/6600	870/6470		
DW 2	Plug	1579121	2782606	7345	2920	4425	2550-2920	4795-4425	TH/D	740/6605	870/6475		
DW 2-a (1)	PMLU	1579202	2782709	7347	925	6422	750-900	6597-6447	PL	741/6606	871/6476		
DW 3	PMLU	1579008	2782795	7347	1150	6197	737-891	6610-6456	PL	751/6606	871/6476		
DW 4	PMLU	1578965	2783021	7349	1130	6214	750-900	6599-6449	PL	750/6599	880/6469		
DW 5	PMLU	1579038	2783256	7406	1172	6234	852-1002	6554-6404	PL	807/6599	937/6469		
DW 6	PMLU	1579210	2783402	7385	1190	6195	845-995	6540-6390	PL	800/6585	930/6455		
DW 7	PMLU	1579455	2783384	7376	1125	6251	825-995	6551-6401	PL	780/6596	910/6466		
DW 8	PMLU	1579672	2783240	7346	1044	6302	791-941	6555-6405	PL	746/6600	876/6470		
DW 9	Plug	1579723	2782973	7340	2845	4495	2538-2840	4802-4500	TH	738/6602	868/6472		
DW 10	PMLU	1579619	2782734	7337	1065	6272	738-888	6599-6449	PL	738/6599	868/6469		
DW 11	Plug	1578845	2783245	7446	3028	4418	2819-3028	4627-4418	TH/D	847/6599	977/6469		
DW 12	Plug	1579421	2783439	7419	2940	4479	2791-2940	4628-4479	TH/D	819/6600	949/6470		
DW 13	Plug	1579378	2782065	7317	3185	4132	3045-3185	4247-4132	W	722/6595	852/6465	3132/4185	3272/4045
DW 14	Plug	1578847	2782182	7338	3205	4133	3048-3188	4290-4150	W	736/6602	866/6472	3146/4192	3286/4052
DW 15	Plug	1578491	2782501	7347	3205	4142	3056-3196	4291-4151	W	744/6603	874/6473	3154/4193	3294/4053
DW 16	Plug	1578334	2782995	7393	3275	4118	3105-3245	4288-4148	W	793/6600	923/6470	3203/4190	3343/4050
DW 17	Plug	1578570	2783563	7501	3342	4159	3209-3342	4291-4159	W	896/6604	1027/6474	3307/4194	3447/4054
DW 18	Plug	1578902	2783778	7502	3314	4188	3212-3314	4295-4192	W	900/6606	1030/6476	3310/4196	3450/4056
DW 19	Plug	1579493	2783781	7453	3274	4179	3166-3274	4287-4179	W	854/6599	984/6469	3264/4189	3404/4049
DW 20	Plug	1579945	2783505	7385	3223	4162	2938-3223	4447-4162	D-W	786/6599	916/6469	3196/4189	3336/4049
DW 21	Plug	1580165	2782966	7316	3184	4132	2873-3173	4443-4143	D-W	721/6595	851/6465	3131/4185	3271/4045
DW 22	Plug	1579900	2782460	7305	3195	4110	3019-3159	4286-4146	W	707/6598	837/6468	3117/4188	3257/4048
SM-24-38	Plug	1579132	2783007	7349	3535	3814	3107-3247	4324-4184	W	795/6636	925/6506	3205/4226	3345/4086
SM-24-43	Plug	1579029	2782948	7347	3535	3812	3064-3204	4283-4143	W	752/6595	882/6465	3162/4185	3302/4045

(1) Well 2-a supplies domestic water from the Pt. Lookout Sandstone

(2) Wells installed in 1977

(3) PMLU= Post-mining land use

(4) All well casings are steel – 8 5/8 " ID in Pt Lookout, 9 5/8 " ID in Tres Hermanos and Dakota, 10 ¾" ID with 7 " liner in Westwater

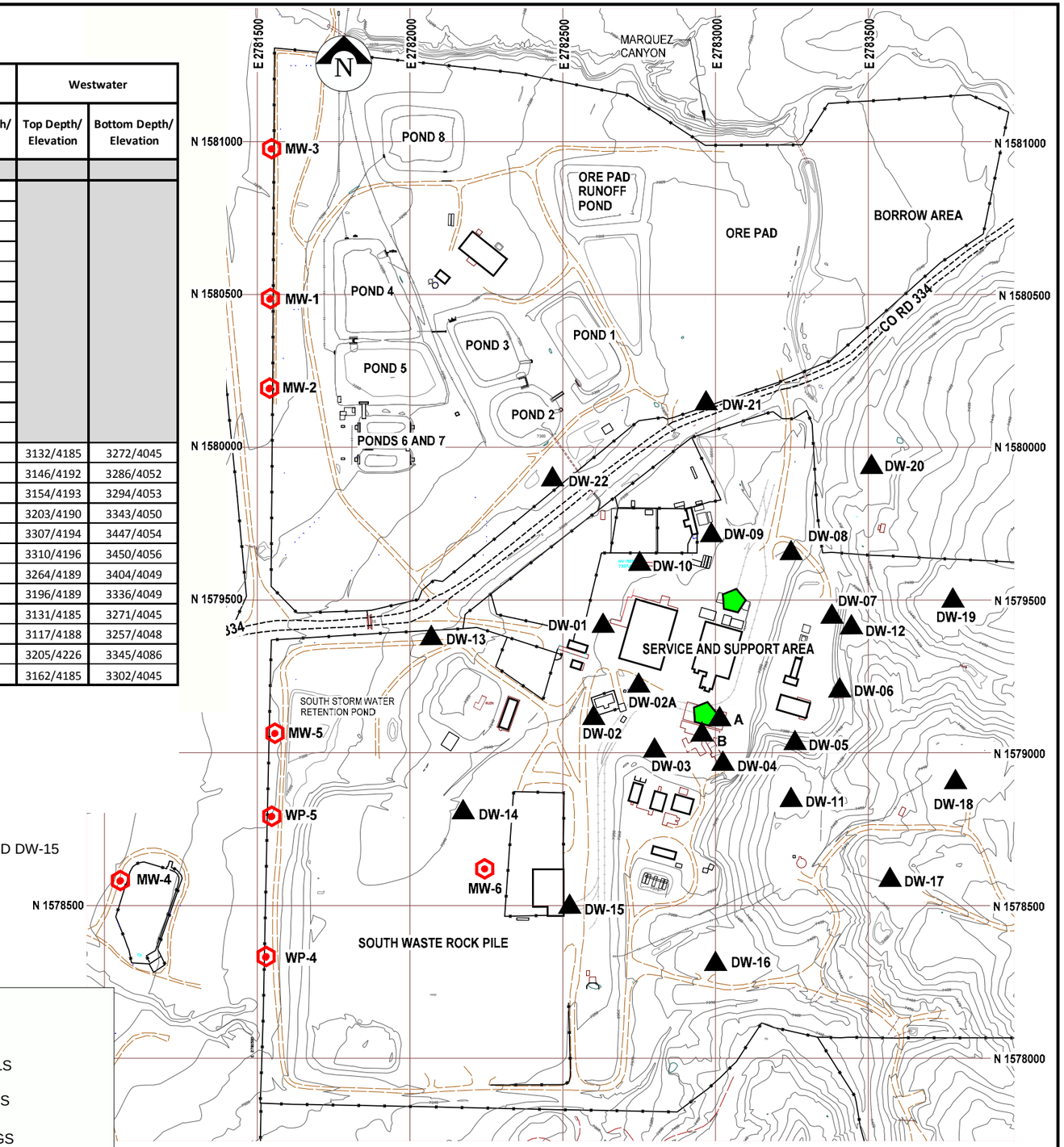
(5) Elevation and depths of screens and formation intercepts are approximate.

(6) PL=Pt Lookout, TH= Tres Hermanos, D= Dakota, W= Westwater

NOTE: WELLS NOS: DW-01, DW-02 AND DW-15 HAVE BEEN TAKEN OUT OF SERVICE.

MONITORING WELLS INFORMATION TABLE

Well No.	State Plane Coordinates NAD 83		Year Installed	Casing/liner Diameter inches	Casing/liner Material	Collar Elevation, Feet AMSL	Screen Interval, ft	
							Depth/ Elevation of top	Length
	Easting	Northing						
MW-1	2781541	1580484	1979	3	steel	7274	25	10
MW-2	2781538	1580191	1979	3	steel	7275	25	10
MW-3	2781545	1580976	1979	3	steel	7272	30	10
MW-4	2781050	1578580	2005	4	PVC	7284.2	33	15
MW-5	2781556	1579062	2005	2	PVC	7297	22.5	10
MW-6	2782243	1578620	2011	2	PVC	7341	15	35
WP-4	2781527	1578330	1982	4	PVC	7308	36	10
WP-5	2781545	1578790	1982	4	PVC	7302	30	10



RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

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Alan Kuhn Associates LLC

FIGURE 1-4
WELL LOCATIONS AND DESCRIPTIONS

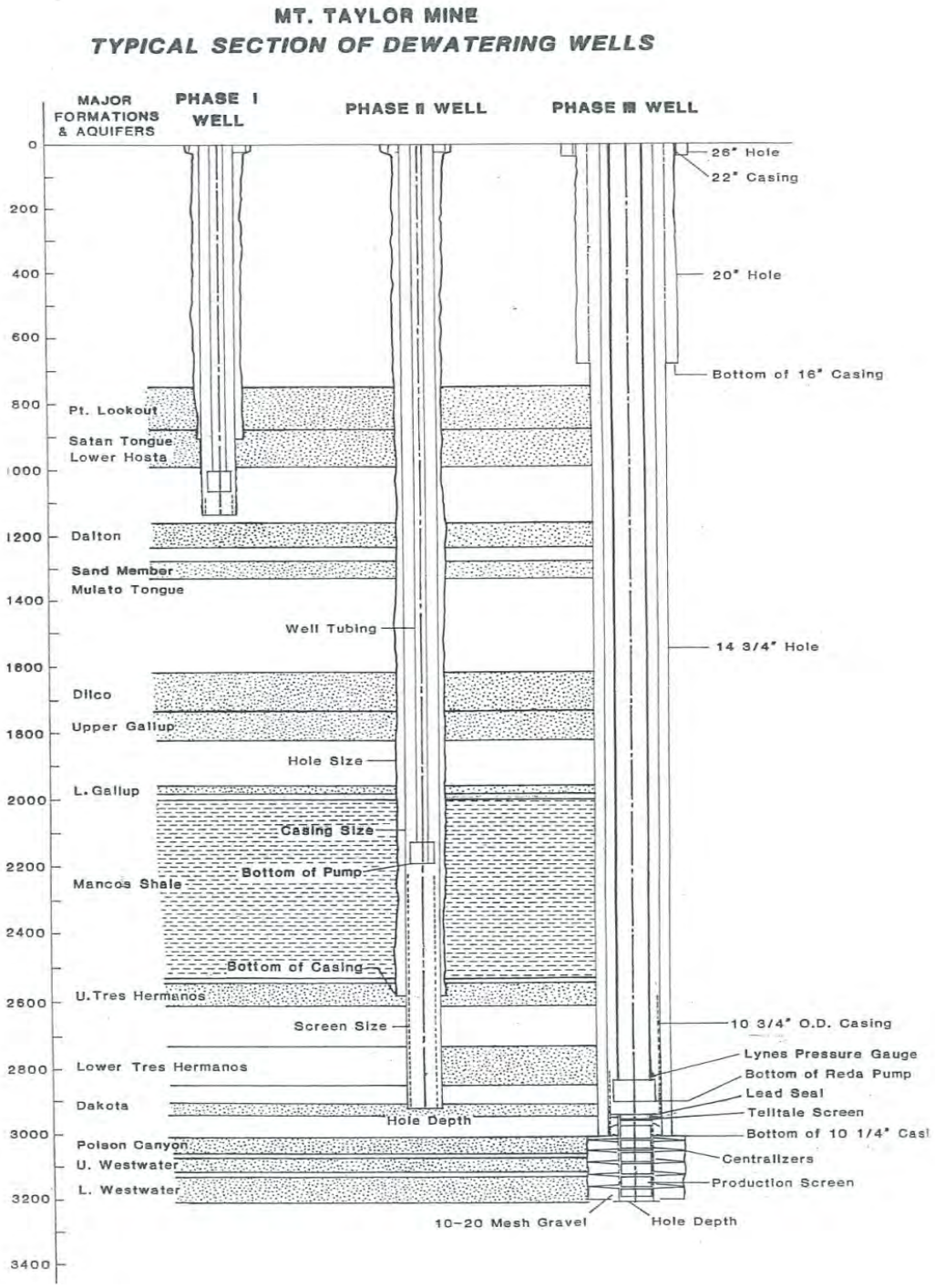
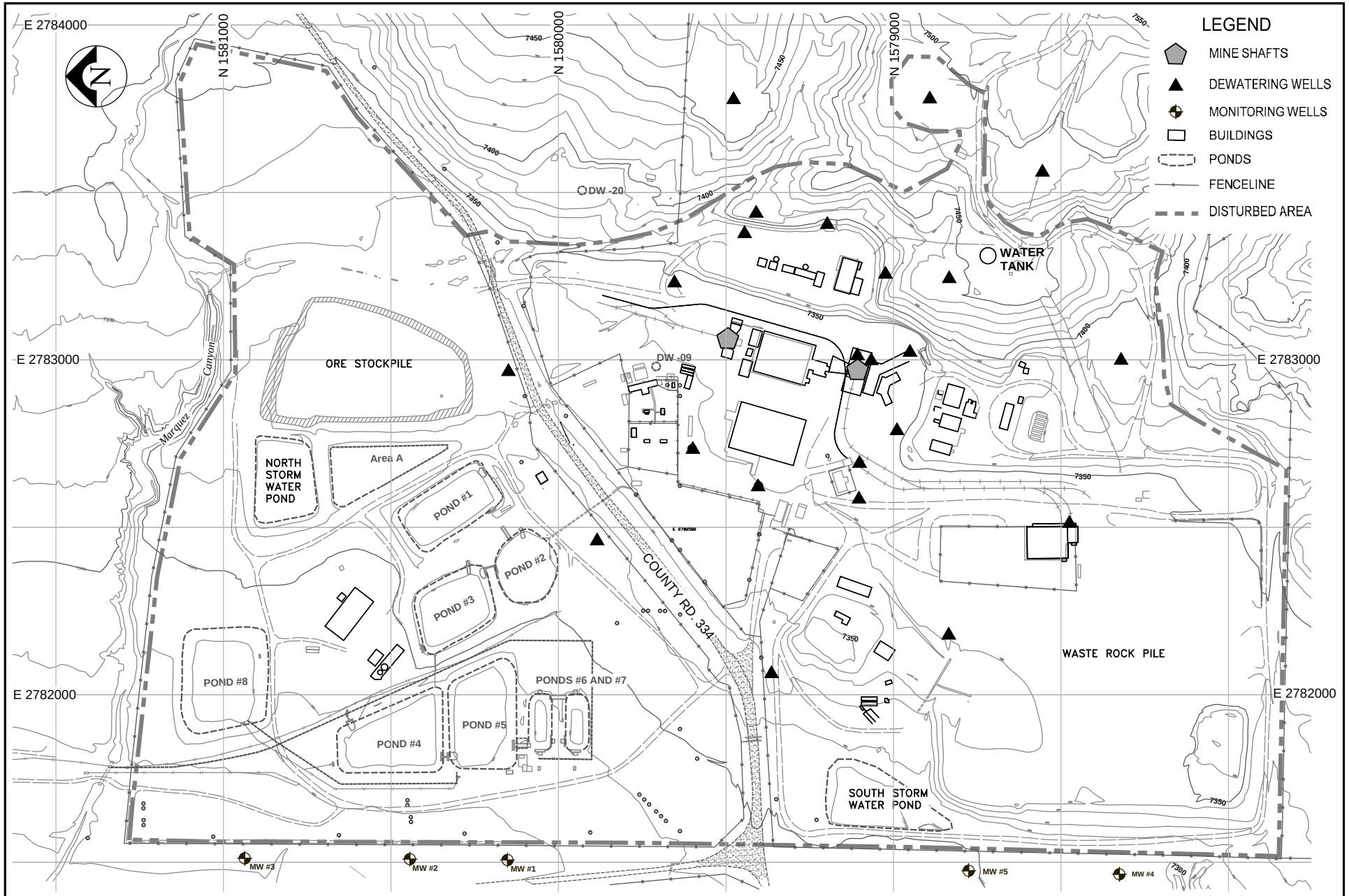


Figure 1-5 Typical Section of Dewatering Wells



NOTE:
FOR DETAIL SITE PLAN SEE
DRAWING MT12-CL-04

0 200 400
SCALE IN FEET

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FIGURE 2-1
EXISTING MINE UNITS

1 PRIMARY PUMP STATION

2 DISCHARGE POINT
OUTFALL 001

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FIGURE 2-2
Treated Water Pipeline

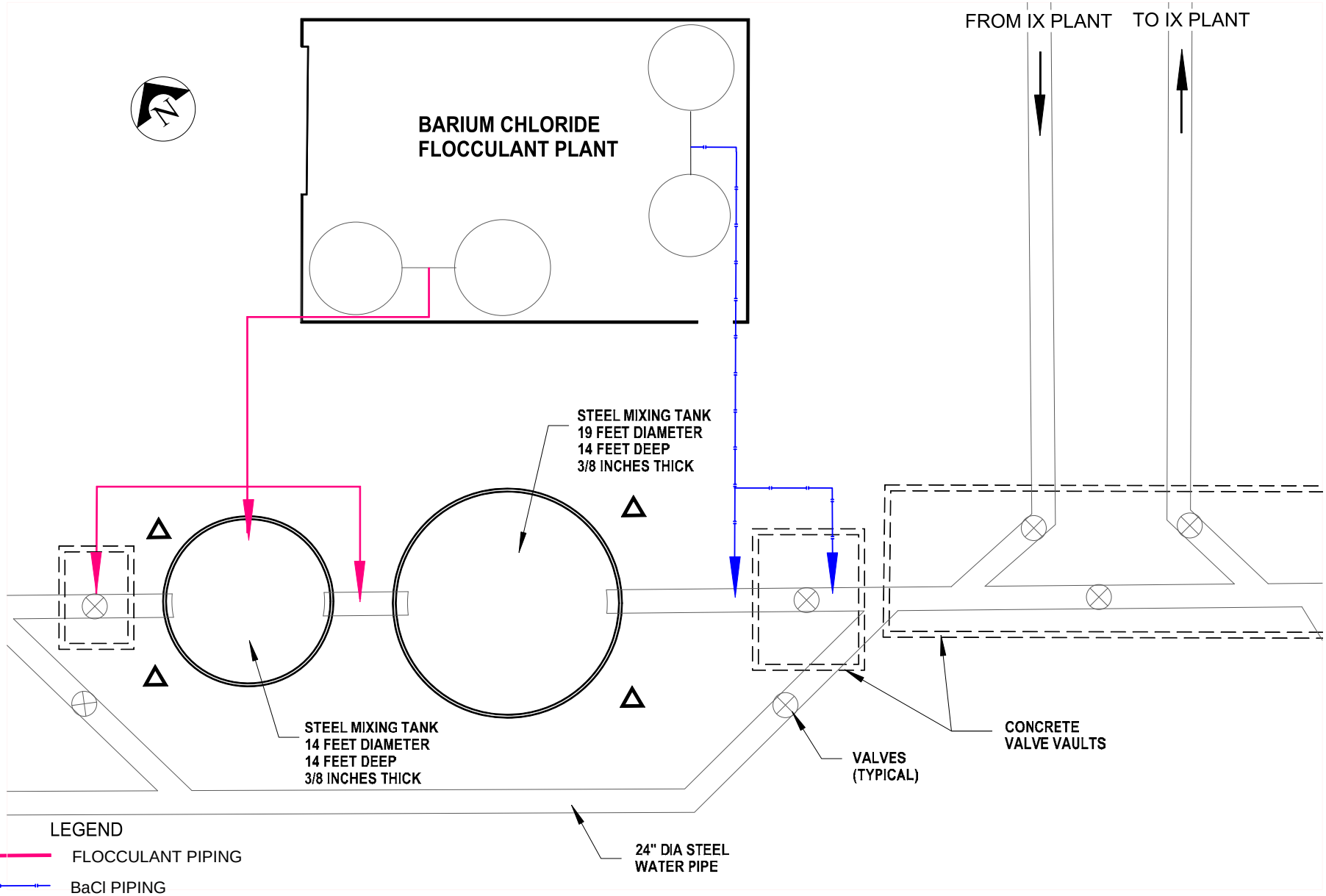

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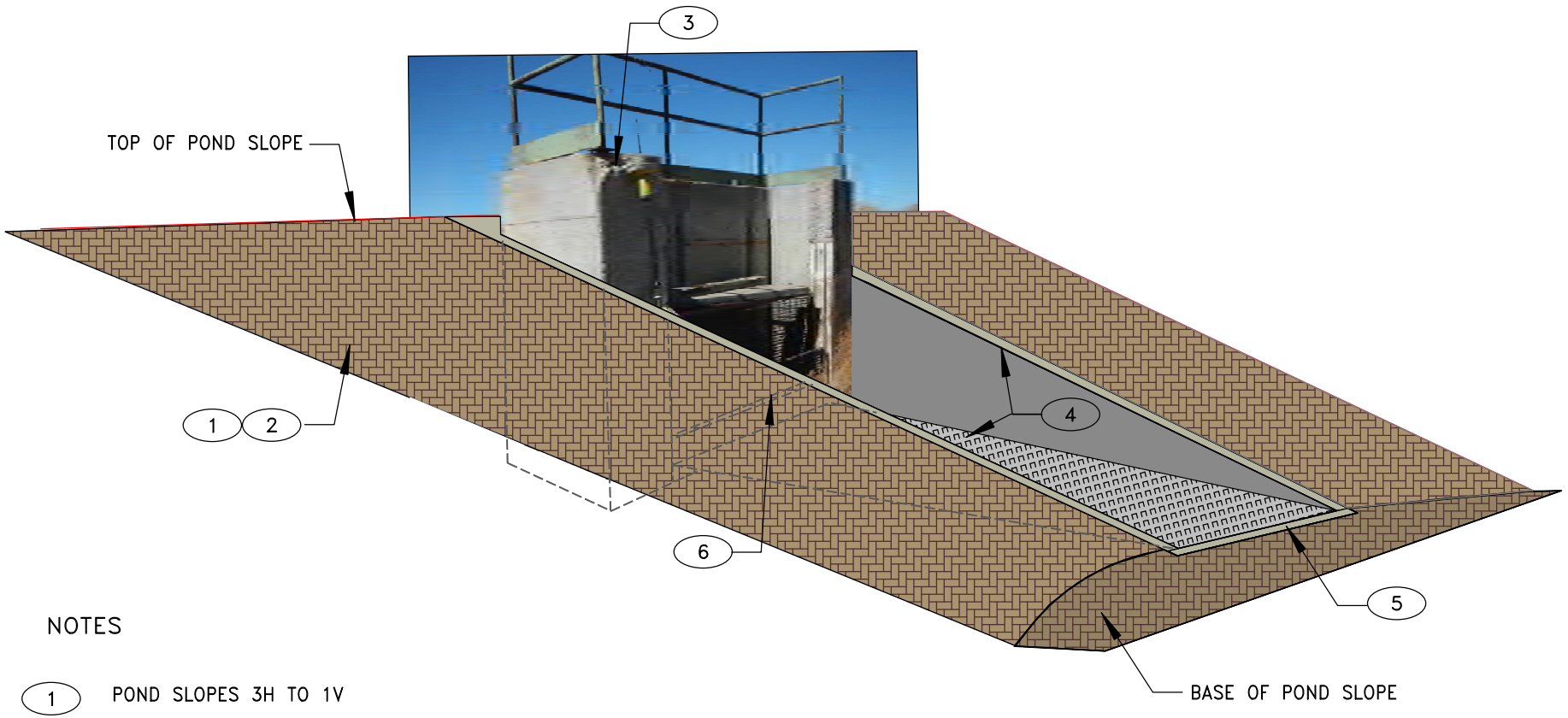
FIGURE 2-3
RADIUM TREATMENT SYSTEM



NOTES

1. POND SLOPES 3H TO 1V
2. DOUBLE LINER (SEE DRAWING MT13-AC-07 FOR DETAILS)
3. EXISTING HYDRAULIC STRUCTURES
   REPAIR DAMAGED OR CRACKED AREAS
   APPLY POLIBRID COATING
4. NEW CONCRETE CURB AND SPILLWAY
   SEE DRAWING MT13-AC-06 FOR DETAILS
5. DOUBLE LINER ATTACHED TO CONCRETE CURB
   BY EXTRUSION WELD TO EMBEDDED HDPE CHANNEL
   SEE DRAWING MT13-AC-06 FOR DETAILS
6. CONCRETE WEIR

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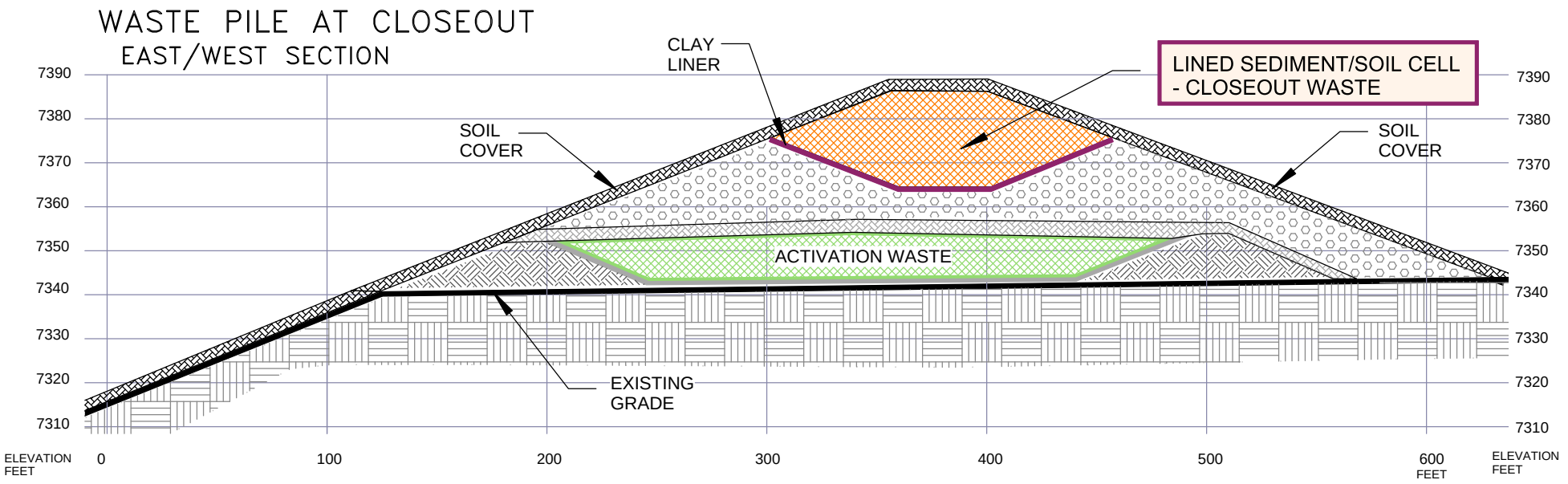
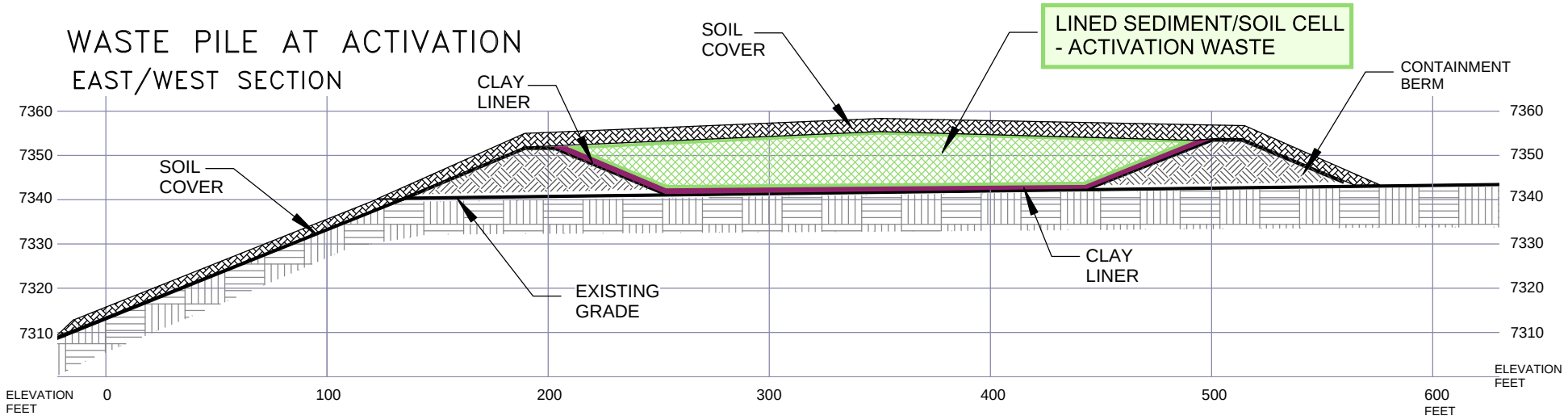
FIGURE 3-1

Isometric View of Typical
Hydraulic Control Structure



SCALE: AS SHOWN BY GRID
(VERTICAL SCALE = 2X HORIZONTAL SCALE)



SCALE: AS SHOWN BY GRID
(VERTICAL SCALE = 2X HORIZONTAL SCALE)

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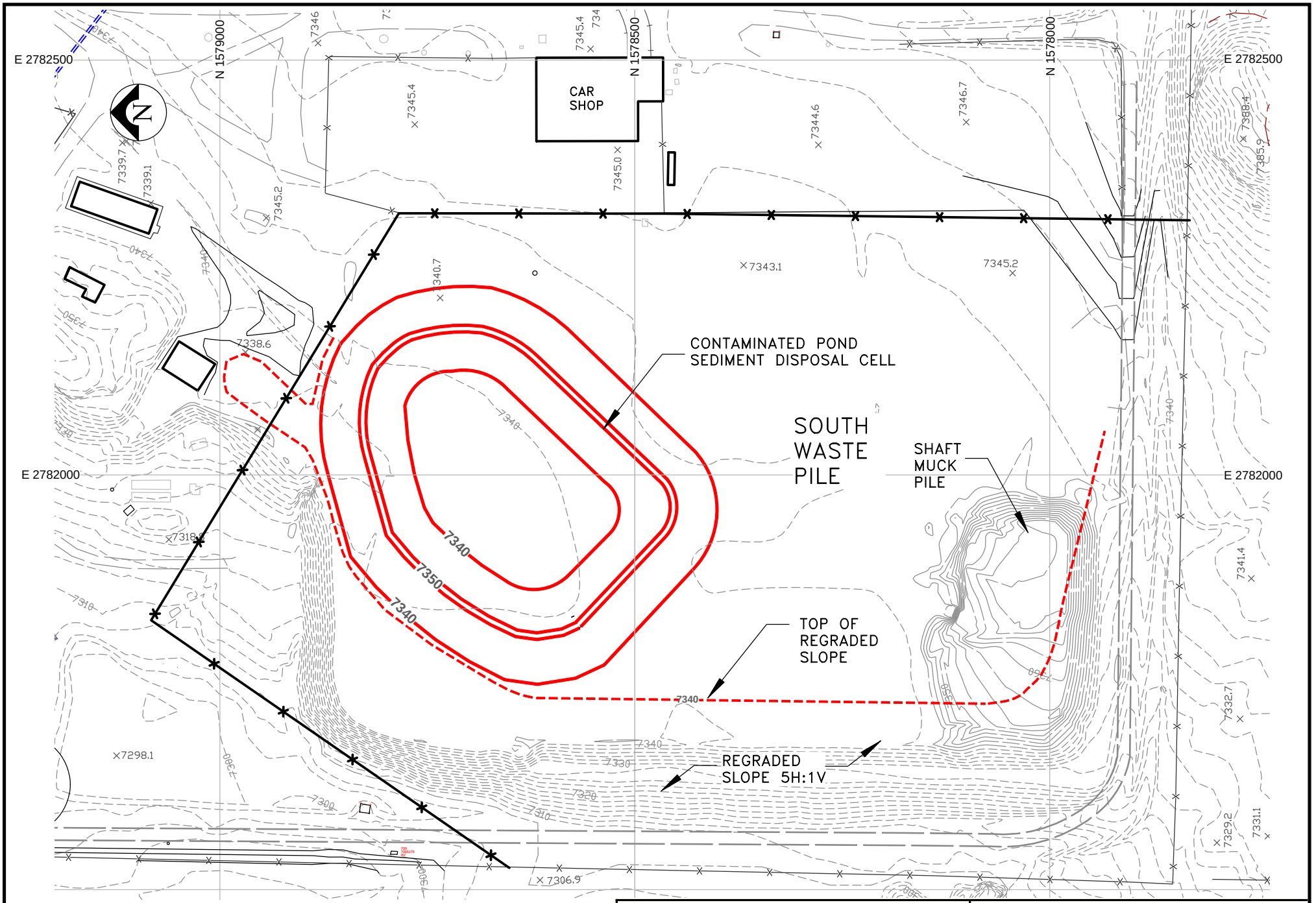
FIGURE 3-2
Schematic Section View of
Waste Pile LIned Disposal Cells



0 150 300 FT

GRAPHIC SCALE

NOTE: TOPOGRAPHY SHOWN ON THIS PLAN REFLECTS THE EXISTING SITE CONDITIONS

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MOUNT TAYLOR MINE - San Mateo, NM 87020

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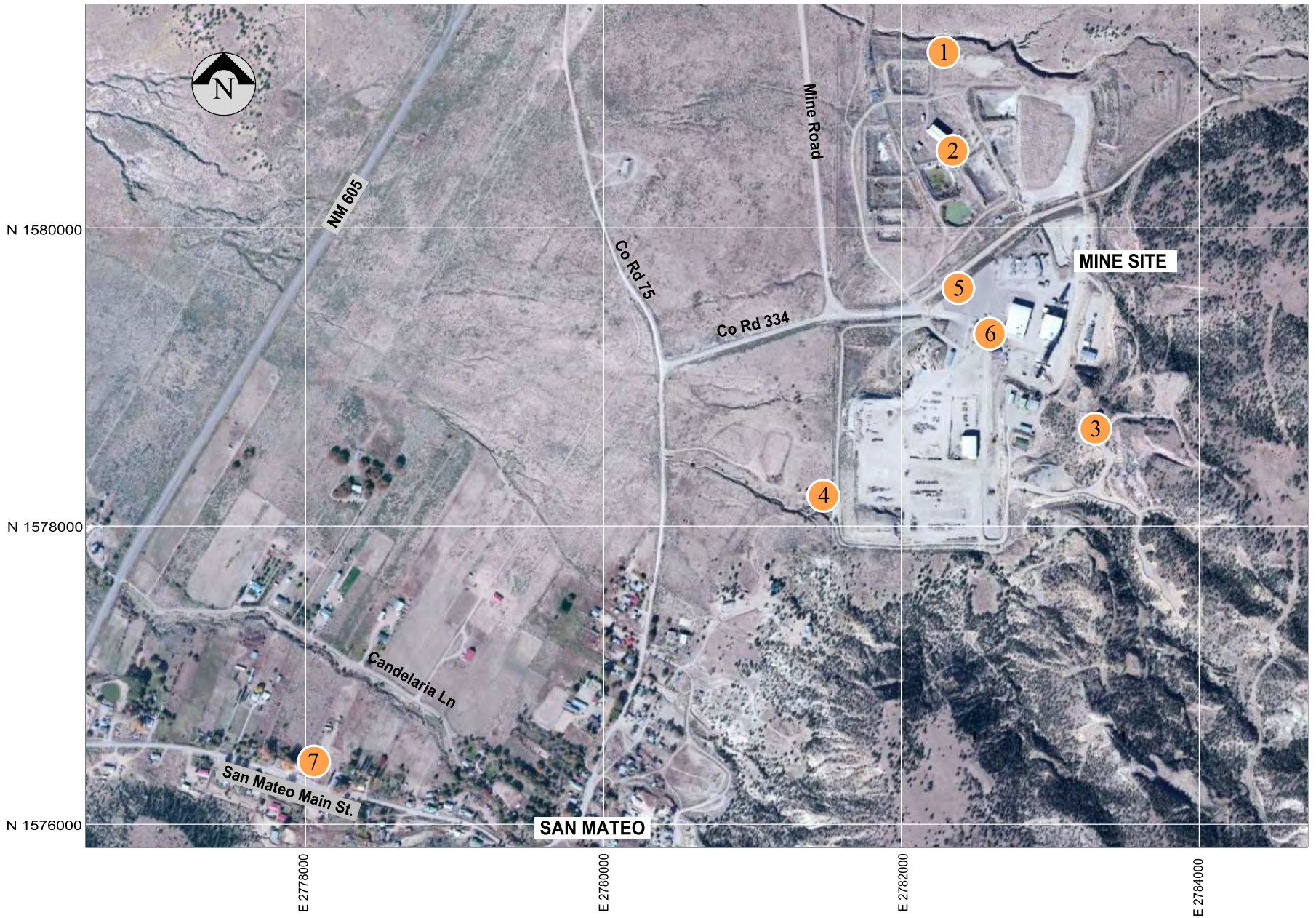
FIGURE 3-3

Mine Activation Contaminated Pond Sediment Disposal Cell



LEGEND

(#) RADIOLOGICAL MONITORING STATION

2000' GRID = NAD 83 NEW MEXICO WEST

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Alan Kuhn Associates LLC

FIGURE 6-1

RADIOLOGICAL MONITORING LOCATIONS

Table 1.1 Deep Wells

Well No.	Closure Disposition ***	State Plane Coordinates (NAD 83)		Collar Elevation, Feet AMSL	Depth Feet from surface	Depth Feet Elevation	Screened Interval (Feet Depth)	Screened Interval (Feet Elevation)	Aquifer in Screened Interval PL=Pt Lookout TH= Tres Hermanos D= Dakota W= Westwater	Pt Lookout Top Depth/ Elevation	Pt Lookout Bottom Depth/ Elevation	Westwater Top Depth/ Elevation	Westwater Bottom Depth/ Elevation
		E	N										
1	PMLU	2782628	1579416	7335	1118	6217	740-890	6595-6445	PL	740/6595	870/6465		
2	Plug	2782597	1579115	7335	2920	4415	2550-2920	4785-4415	TH/D	740/6595	870/6465		
2-a*	PMLU	2782709	1579202	7347	925	6422	750-900	6597-6447	PL	741/6606	871/6476		
3	PMLU	2782796	1579006	7336	1150	6186	737-891	6599-6445	PL	751/6595	871/6465		
4	PMLU	2783022	1578963	7345	1130	6215	750-900	6595-6445	PL	750/6595	880/6465		
5	PMLU	2783257	1579033	7402	1172	6230	852-1002	6550-6400	PL	807/6595	937/6465		
6	PMLU	2783403	1579209	7395	1190	6205	845-995	6550-6400	PL	800/6595	930/6465		
7	PMLU	2783377	1579450	7375	1125	6250	825-995	6550-6400	PL	780/6595	910/6465		
8	PMLU	2783243	1579715	7341	1044	6297	791-941	6550-6400	PL	746/6595	876/6465		
9	Plug	2782983	1579716	7333	2845	4488	2538-2840	4795-4493	TH	738/6595	868/6465		
10	PMLU	2782748	1579622	7333	1065	6268	738-888	6595-6445	PL	738/6595	868/6465		
11	Plug	2783246	1578843	7442	3028	4414	2819-3028	4623-4414	TH/D	847/6595	977/6465		
12	Plug	2783442	1579417	7414	2940	4474	2791-2940	4623-4474	TH/D	819/6595	949/6465		
13	Plug	2782068	1579376	7317	3185	4132	3045-3185	4247-4132	W	722/6595	852/6465	3132/4185	3272/4045
14	Plug	2782170	1578805	7331	3205	4126	3048-3188	4283-4143	W	736/6595	866/6465	3146/4185	3286/4045
15	Plug	2782520	1578497	7339	3205	4134	3056-3196	4283-4143	W	744/6595	874/6465	3154/4185	3294/4045
16	Plug	2782997	1578315	7388	3275	4113	3105-3245	4283-4143	W	793/6595	923/6465	3203/4185	3343/4045
17	Plug	2783566	1578569	7492	3342	4150	3209-3342	4283-4150	W	896/6595	1027/6465	3307/4185	3447/4045
18	Plug	2783783	1578902	7495	3314	4181	3212-3314	4283-4181	W	900/6595	1030/6465	3310/4185	3450/4045
19	Plug	2783783	1579490	7449	3274	4175	3166-3274	4283-4175	W	854/6595	984/6465	3264/4185	3404/4045
20	Plug	2783507	1579942	7381	3223	4158	2938-3223	4443-4158	D-W	786/6595	916/6465	3196/4185	3336/4045
21	Plug	2782967	1580148	7316	3184	4132	2873-3173	4443-4143	D-W	721/6595	851/6465	3131/4185	3271/4045
22	Plug	2782464	1579896	7302	3195	4107	3019-3159	4283-4143	W	707/6595	837/6465	3117/4185	3257/4045
SM-24-38	Plug	2783008	1579116	7390	3535	3855	3107-3247	4283-4143	W	795/6595	925/6465	3205/4185	3345/4045
SM-24-43	Plug	2782953	1579065	7347	3535	3812	3064-3204	4283-4143	W	752/6595	882/6465	3162/4185	3302/4045

*Well 2-a supplies domestic water from the Pt. Lookout Sandstone ** Wells installed in 1977 *** PMLU= Post-mining land use

****All well casings are steel – 8 5/8 " ID in Pt Lookout, 9 5/8 " ID in Tres Hermanos and Dakota, 10 ¾" ID with 7 " liner in Westwater

Table 1.1 Deep Wells

Elevation and depths of screens and formation intercepts are approximate.

Table 1.2 Ground Water Levels in Wells and Shafts

Description	State Plane Coordinates (NAD 83)		Collar Elevation (Feet AMSL)	Total Depth (Feet from Collar)	Depth to Water (Feet from Collar)	Elevation of Water Level (feet AMSL)	DATE MEASURED
	N	E					
14' SHAFT	1579534	2783046	7343	~3300	794	6549	December 2013
WELL 2A (DOMESTIC WELL)	1579120	2782651	7336	1150	483	6853	August 2011
WELL #6 PHASE II	1579210	2783402	7395	1190	598	6797	December 2013
WELL #11 PHASE II	1578845	2783245	7442	3028	933	6509	December 2013
WELL #12 PHASE II	1579421	2783439	7414	2940	819	6595	December 2013
WELL #13 PHASE III	1579378	2782065	7317	3815	771	6546	December 2013
WELL #20 PHASE III	1579945	2783505	7381	3223	836	6545	December 2013

Other wells were not accessible at the time of measurement.

***San Mateo Municipal Well

Elevation	7240
Top of Point Lookout	576'
Depth to Water	196'
Depth of Well	701'
Date Drilled	1976

Table 2.1 Deep Ground Water Quality Data

Well #	Date	**Constituent**	Uranium	Radium 226	Selenium	Chloride	Iron	Sulfate	Total dissolved solids	Zinc	pH	Molybdenum
		20.6.2.3103 NMAC STANDARDS FOR GROUND WATER	0.03 mg/l	30 pCi/l	0.05	250 mg/l	1.0 mg/l	600 mg/l	1000 mg/l	10 mg/l	6 to 9 s.u.	1.0 mg/l
2a	5/23/1977				<0.01	1.3	0.1	<1.0	228	0.01	7.67	0.001
	3/10/2010		0.0012	0.24	0.001	6	ND	92	523	0.11	9	ND
2b	5/23/1977				<0.01	30.8	0.05	130	577	0.01	8.54	0.001
	8/29/1977		0.002		<0.01							0.001
	9/19/1977		0.006		<0.01							<0.05
9	5/23/1977				<0.01	20.4	0.13	172			8.44	0.001
	8/29/1977		<0.001		<0.01							0.001
	9/19/1977		0.001		<0.01							<0.05
11	5/23/1977				<0.01	38.5	1.49	363	1020		8.41	0.001
	8/29/1977		0.002		<0.01							<0.001
	9/19/1977		0.003		<0.01							<0.05
12	5/23/1977				<0.01	30	0.51	167	745	0.01	8.42	0.002
	8/29/1977		<0.001		<0.01							<0.001
	9/19/1977		0.037		<0.01							<0.05
13	10/17/1977		0.004		<0.01							<0.05
14	2/7/1978				<0.005							<0.10
	4/10/1978		0.004		<0.005							<0.05
	4/26/1978		0.001		<0.005							<0.05
15	2/21/1978		0.009		<0.005							<0.10
16	2/21/1978		0.034		<0.005							0.10
17	02/01/78				<0.005							<1.0
	3/20/1978		0.007		<0.005							<0.05
18	11/7/1977		0.011		ND							<0.05
	3/8/1978		0.027		<0.005							<0.10
19	10/24/1977		0.005		<0.01							<0.05
	3/8/1978				0.005							<0.10
	4/10/1978		0.008		<0.005							<0.05
20	8/29/1977		<0.001		<0.01							<0.001
	9/19/1977		0.005		<0.01							<0.05
21	10/5/1977		0.002		<0.01							<0.05
	3/8/1978		0.013		<0.005							<0.10
22	10/24/1977		0.005		<0.01							<0.05
	4/26/1978		0.002		0.002							<0.05
SM 24-43	5/23/1977				<0.01	4.8	0.07	259	642	<0.01	8.09	0.002
14 ft shaft	12/12/2011		0.0326		0.015	4	ND	29	350	0.02	8.19	0.1
24 ft shaft	9/28/2007		0.071	16.8	ND	4	0.05	44	358	ND	8.38	0.2

Table 2.2 Sanitary Treatment Plant (STP) Discharge Water Quality

Parameter	Limit, mg/L (1)	Most Recent, mg/L, 11/1/1989
As	0.1	0.017
Ba	1.0	0.05
COD	<125	<0.1
Cl	250	11
F	1.6	0.903
Mo	1	0.87
NO_3 as N	10.0	0.1
Pb	0.05	<0.005
Se	0.05	0.059
SO_4	600	350
TDS	1000	730
TSS		1.4
U	0.03	0.753
V		0.01
Zn	10	0.019
Ra 226/228	30 pCi/L	2.1 pCi/L
Pb 210		0.8 pCi/L
Po 210		5.1 pCi/L
pH	6-9 SU	8.88 SU

(1) per 20.6.2.3103 NMAC, in mg/L except as indicated

Table 5.1 List of Relevant Permits and Licenses

Permit /License Name	Permit /License #	Issuing Agency
Mine Permit (Existing)	C1002RE	Mining and Minerals Division
Discharge Permit	DP-61	NMED Ground Water Quality Bureau
NPDES (Mine Water Discharge)	NM0028100	US EPA
NPDES Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP) (Stormwater)	NMR05GB27	US EPA
Source Material License	SO043	NMED Radiation Control Bureau
Special Use Permit	MOT 220 USDA	US Forest Service
Solid Waste Landfill for Mine	none	NMED Solid Waste Bureau

Table 5.2 AAQS Criteria Pollutants

Criteria Pollutants (Promulgating Agency) [Regulatory Citation]		**Averaging Time**	**Limit**	**Indications**
Carbon Monoxide (NMED) [20.2.3.111.A NMAC]		8-hour	8.7 ppm	Maximum allowable concentration
		1-hour	13.1 ppm	Maximum allowable concentration
Nitrogen Dioxide (NMED) [20.2.3.111.B NMAC]		24-hour	0.1 ppm	Maximum allowable concentration
		Annual	0.05 ppm	Arithmetic average
Particle Pollution (EPA)	$PM_{2.5}$ [40CFR50.7]	Annual	12 µg/m^3	Averaged over 3 years
		Annual	15 µg/m^3	Averaged over 3 years
		24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10} [40CFR50.6]	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Total Suspended Particulate (NMED) [20.2.3.109 NMAC]		24-hour	150 µg/m^3	Maximum allowable concentration
		7-day	110 µg/m^3	Maximum allowable concentration
		30-day	90 µg/m^3	Maximum allowable concentration
		Annual	60 µg/m^3	Geometric Mean
Sulfur Dioxide (EPA) [40CFR50.4]		1-hour	0.075 ppm	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		3-hour	0.5 ppm	Not to be exceeded more than once per year

Table 6.1 Mine Water Discharge Monitoring Parameters of NM0028100 and DP-61

PARAMETER	DISCHARGE LIMIT 30 Day Avg., mg/l*	DISCHARGE LIMIT Daily Max., mg/l*	PERMIT STANDARD USED (1)
pH	6.6-9.0 Standard Units	6.6-9.0 Standard Units	NM0028100
Total Suspended Solids	20	30	NM0028100
Chemical Oxygen Demand	100	125	NM0028100 (2)
Ra 226 (dissolved)	3 pCi/l	10 pCi/l	NM0028100 (2)
Total Ra 226	10 pCi/l	30 pCi/l	NM0028100 (2)
Total Ra 226+Ra 228	20 pCi/l	30 pCi/l	NM0028100
Uranium	0.03	0.03	DP-61
Zinc	0.5	1.0	NM0028100
Aluminum	3.3	5.0	NM0028100
Boron	0.5	0.75	NM0028100
Cadmium	0.01	0.01	DP-61
Chromium	0.05	0.05	DP-61
Cobalt	0.033	0.05	NM0028100
Copper	0.35	0.53	NM0028100
Mercury	0.00051	0.00077	NM0028100
Molybdenum	0.67	1.0	NM0028100
Selenium	0.0033	0.005	NM0028100
Vanadium	0.067	0.1	NM0028100
Total Alpha	10 pCi/l	15 pCi/l	NM0028100
E. Coli	126 cfu/100 ml (3)	410 cfu/100 ml (3)	NM0028100
Arsenic	0.1	0.1	DP-61 (2)
Barium	1.0	1.0	DP-61 (2)
Fluoride	1.6	1.6	DP-61 (2)
Lead	0.05	0.05	DP-61 (2)
Chloride	250	250	DP-61 (2)
Sulfate	600	600	DP-61 (2)
Nitrate (NO_3 as N)	10	10	DP-61 (2)
Daphnia pulex	(4)	(4)	NM0028100
Flow	(5)	(5)	NM0028100

* mg/l unless otherwise noted

(1) If the standard of both permits for this parameter is not the same, the more stringent of the standard of NPDES Permit # NM0028100 or of DP-61 is used.

(2) Not required by the other permit.

(3) cfu = Colony Forming Unit

(4) Whole effluent toxicity testing - 48-Hour Static Renewal. Monitoring frequency 1/3-month for the first year of the permit. If all tests pass, reduce the frequency to 1/6-month for years 2 – 5, and resume the frequency of 1/3-month on the last day of the permit. If any test fails during the period of the permit, return the frequency to 1/3-month for the remainder of the permit.

(5) Report discharge flow in MGD.

(6) Samples taken in compliance with the monitoring requirements of NM0028100 shall be taken daily at Outfall 001. Other parameters sampled only for DP-61 will be taken quarterly.

Table 6.2 Action Leakage Rates for Mt. Taylor Mine Ponds

	Pond 1	Pond 2	Pond 3	Pond 4	Pond 5	Pond 8	Ore Pad Runoff Pond
Total area at bottom of pond, sq ft	38950	20070	23650	34430	35896	30580	24420
Total area at bottom of pond, ac	0.89	0.46	0.54	0.79	0.82	0.70	0.56
Minimum Pool (water just covering liner)							
Water surface area, sq ft	38950	20070	23650	34430	35896	30580	24420
Water surface area, ac	0.89	0.46	0.54	0.79	0.82	0.70	0.56
Accumulated water for 1.0 ft head on bottom liner, gal.	291346	150124	176902	257536	268502	228738	182662
ALR, gal/ ac/ day	325829	325829	325829	325829	325829	325829	325829
Operating Pool							
Water surface area, sq ft	61170	34261	41288	63160	58050	53973	64462
Water surface area, ac	1.40	0.79	0.95	1.45	1.33	1.24	1.48
Accumulated water for 1.0 ft head on bottom liner, gal.	291346	150124	176902	257536	268502	228738	182662
ALR, gal/ ac/ day	207472	190870	186637	177617	201481	184608	123433

Ponds 6 and 7 hold clean water in single liners, so ALR is not applicable.

ALR = accumulated water (gal.) to create 1.0 ft of head / acre water surface /day
Accumulated water (gal.) to cause 1.0 ft of head = area of bottom of pond (sq ft) x 1 ft. x 7.48 gal/cu ft

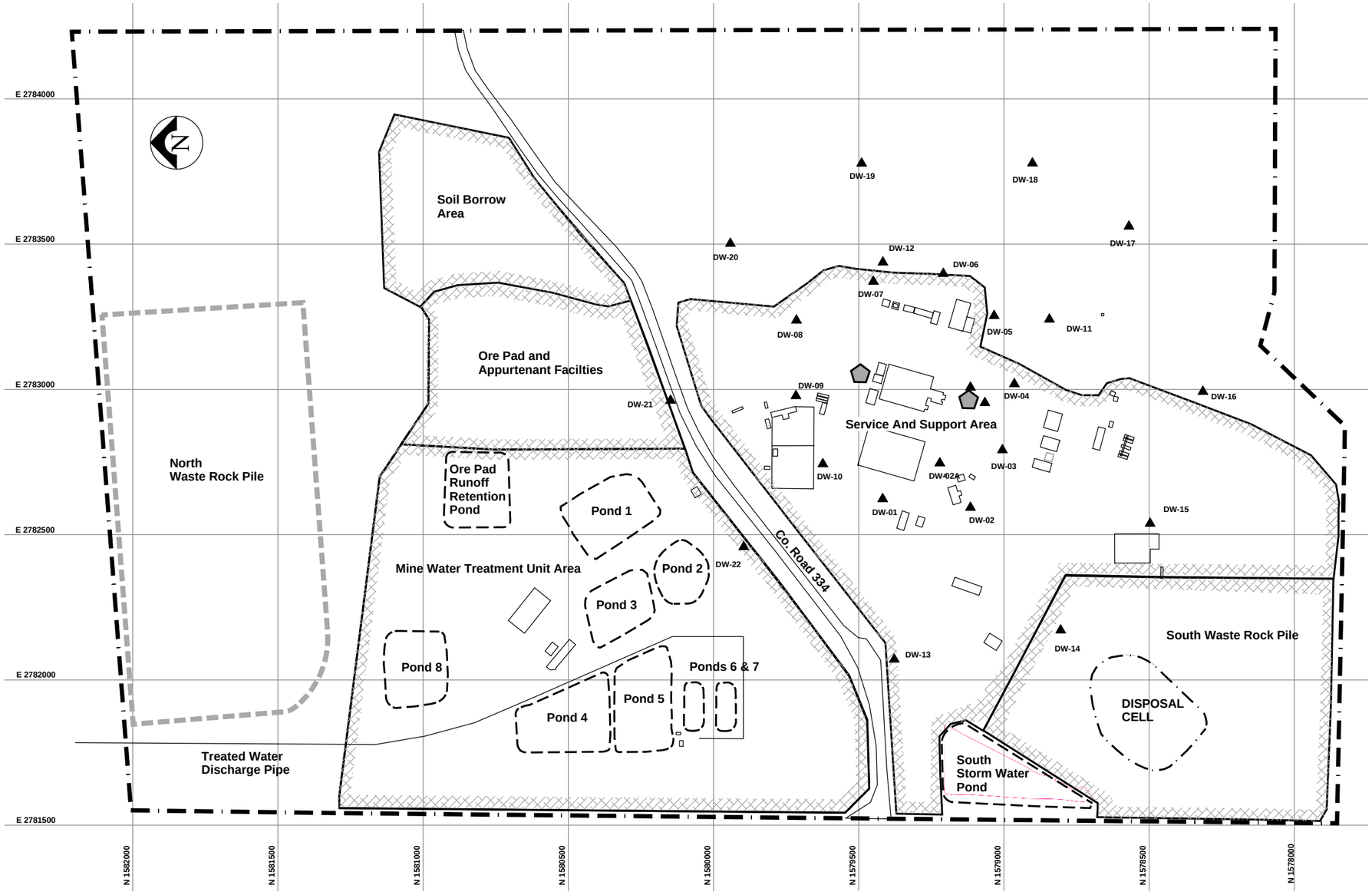
Table 6.3 Water Quality in Point Lookout Aquifer and Mine Pool

CONSTITUENT	20.6.2.3103 NMAC STANDARDS FOR GROUND WATER OF 10,000 mg/l TDS CONCENTRATION OR LESS	Point Lookout Aquifer, Well 2A		Mine Pool in 24-ft Shaft	
		MEASURED VALUE OF SAMPLE COLLECTED ON 3/10/10	VALUE VS STANDARD	MEASURED VALUE OF SAMPLE COLLECTED ON 09/26/07	VALUE VS STANDARD
Uranium	0.03 mg/l	0.0012 mg/l	below standard	0.071 mg/l	above standard
Radium 226	30 pCi/l	0.24 pCi/l	below standard	16.8 pCi/l	below standard
Selenium	0.05 mg/l	0.001 mg/l	below standard	not detected	below standard
	for Domestic Water Supply				
Chloride	250 mg/l	6 mg/l	below standard	4 mg/l	below standard
Iron	1.0 mg/l	not detected	below standard	0.05 mg/l	below standard
Sulfate	600 mg/l	92 mg/l	below standard	44 mg/l	below standard
Total dissolved solids	1000 mg/l	523 mg/l	below standard	358 mg/l	below standard
Zinc	10 mg/l	0.11 mg/l	below standard	not detected	below standard
pH	6 to 9 s.u.	9.0 s.u.	within range	8.38.0 s.u.	within range
	for Irrigation Use				
Molybdenum	1.0 mg/l	not detected	below standard	0.2 mg/l	below standard

APPENDIX A

DRAWINGS

MT13-AC-01	General Site Plan and Drawing Index
MT13-AC-02	Mine Water Treatment Unit Upgrades
MT13-AC-03	MWTU - Sedimentation Ponds
MT13-AC-03A	MWTU Typical Pond Layout
MT13-AC-04	MWTU - IX Plant and Radium Removal Ponds
MT13-AC-05	MWTU - Clean Water Holding Ponds and Distribution
MT13-AC-06	Pond Liner Details
MT13-AC-07	Hydraulic Control Structures Modification Details
MT13-AC-08	South Waste Rock Pile Buildout Plan view
MT13-AC-09	South Waste Rock Pile Buildout Sections
MT13-AC-10	North Waste Pile Plan View
MT13-AC-11	North Waste Pile Section View
MT13-AC-12	Ore Pad and Appurtenant Facilities Plan View
MT13-AC-13	Ore Pad and Appurtenant Facilities Sections
MT13-AC-14	Surface Grading and Drainage Upgrades
MT13-AC-15	Ore Pad Runoff Retention Pond
MT13-AC-16	South Storm Water Retention Pond



DRAWING INDEX

DRAWING NUMBER	DRAWING TITLE
MT13-AC-01	GENERAL SITE PLAN AND DRAWING INDEX
MT13-AC-02	MINE WATER TREATMENT UNIT (MWTU) UPGRADES
MT13-AC-03	MWTU - SEDIMENTATION PONDS
MT13-AC-03A	MWTU - TYPICAL POND LAYOUT
MT13-AC-04	MWTU - IX PLANT AND RADIUM REMOVAL PONDS
MT13-AC-05	MWTU - CLEAN WATER HOLDING PONDS AND DISTRIBUTION
MT13-AC-06A	POND LINER DETAILS-A
MT13-AC-06B	POND LINER DETAILS-B
MT13-AC-07	HYDRAULIC CONTROL STRUCTURES MODIFICATION DETAILS
MT13-AC-08	SOUTH WASTE ROCK PILE AT MINE REACTIVATION -PLAN VIEW
MT13-AC-09	SOUTH WASTE ROCK PILE AT MINE REACTIVATION -SECTIONS
MT13-AC-10	NORTH WASTE PILE - PLAN VIEW
MT13-AC-11	NORTH WASTE PILE - SECTIONS
MT13-AC-12	ORE PAD AND APPURTENANT FACILITIES - PLAN VIEW
MT13-AC-13	ORE PAD AND APPURTENANT FACILITIES - SECTIONS
MT13-AC-14	SURFACE GRADING AND DRAINAGE UPGRADES
MT13-AC-15	ORE PAD RUNOFF COLLECTION AND RETENTION
MT13-AC-16	SOUTH STORM WATER RETENTION POND

LEGEND

- Mine Surface Units Area
- DW-03 — Dewatering Wells
- Ponds
- Support Buildings
- Mine Shaft

NOT FOR CONSTRUCTION

0 250 500 750 1000 FT
GRAPHIC SCALE

500' GRID = NAD 83 NEW MEXICO WEST

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	Final	3-15-13	EL	AK	AK
1	2013 Review Comments	12-17-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

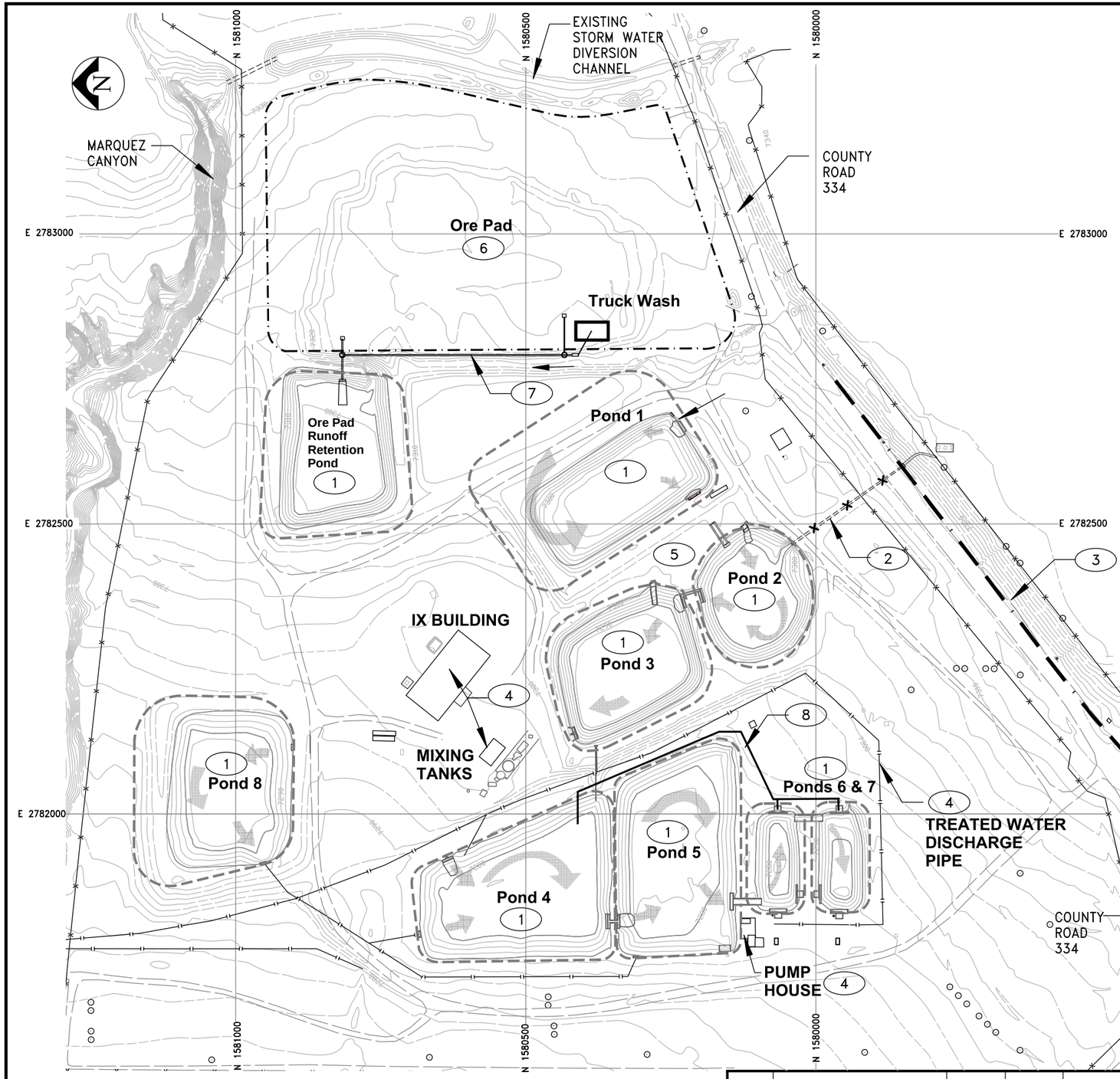
Prepared By: Alan Kuhn Associates LLC

SIZE: B
SCALE: As Shown
DWG NO.: MT13-AC-01

PROJECT TITLE: **MT. TAYLOR MINE**
MINE REACTIVATION PLAN

SHEET TITLE: GENERAL SITE PLAN AND DRAWING INDEX

REV: 1



UPGRADES

(1) ALL MINE WATER TREATMENT PONDS (PONDS 1–8) AND ORE PAD RUNOFF RETENTION POND
- REMOVE ALL BRUSH AND VEGETATION.
- REPAIR OR REPLACE EXISTING CONCRETE HYDRAULIC STRUCTURES (SEE NOTE 5)
- REMOVE SEDIMENTS FROM THE PONDS AND PLACE IN DISPOSAL CELL IN THE SOUTH WASTE ROCK AREA.
- GRADE THE POND BOTTOM TO SLOPE 1% TOWARDS THE SUMP AREA.
- POND SLOPES TO BE 3H TO 1V
- PONDS 1–5 AND 8 TO RECEIVE A DOUBLE LINER SYSTEM
- PONDS 6 AND 7 TO RECEIVE A SINGLE LINER

(2) REMOVE 48" CONCRETE PIPE AND REDIRECT STORM WATER TO SOUTH STORM WATER RETENTION POND

(3) INSTALL NEW 36" CMP PIPE AND MANHOLES

(4) PIPING, PUMPING AND MECHANICAL SYSTEMS UPGRADE AS NEEDED

(5) POND HYDRAULIC STRUCTURES (ALL PONDS) (MT13-AC-07)
REPAIR DAMAGED CONCRETE
ADD NEW CONCRETE SPILLWAYS AND CURB FOR LINER CONNECTIONS
APPLY POLIBRID COATING ON ALL CONCRETE SURFACES
REPLACE STEEL STRUCTURES WITH NEW CONCRETE STRUCTURES AS NEEDED

(6) ORE PAD WITH TRUCK WASH (MT13-AC-12)
GRADED TO DRAIN TO COLLECTION POINTS – INSTALL LINER

(7) STORM WATER SYSTEM TO CONVEY ORE PAD AND TRUCK WASH RUNOFF TO ORE PAD RUNOFF RETENTION POND

(8) ADDITIONAL BYPASS PIPING AROUND POND 5

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	3-15-13	EL	AK	AK
1	Review Comments	12-17-13	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

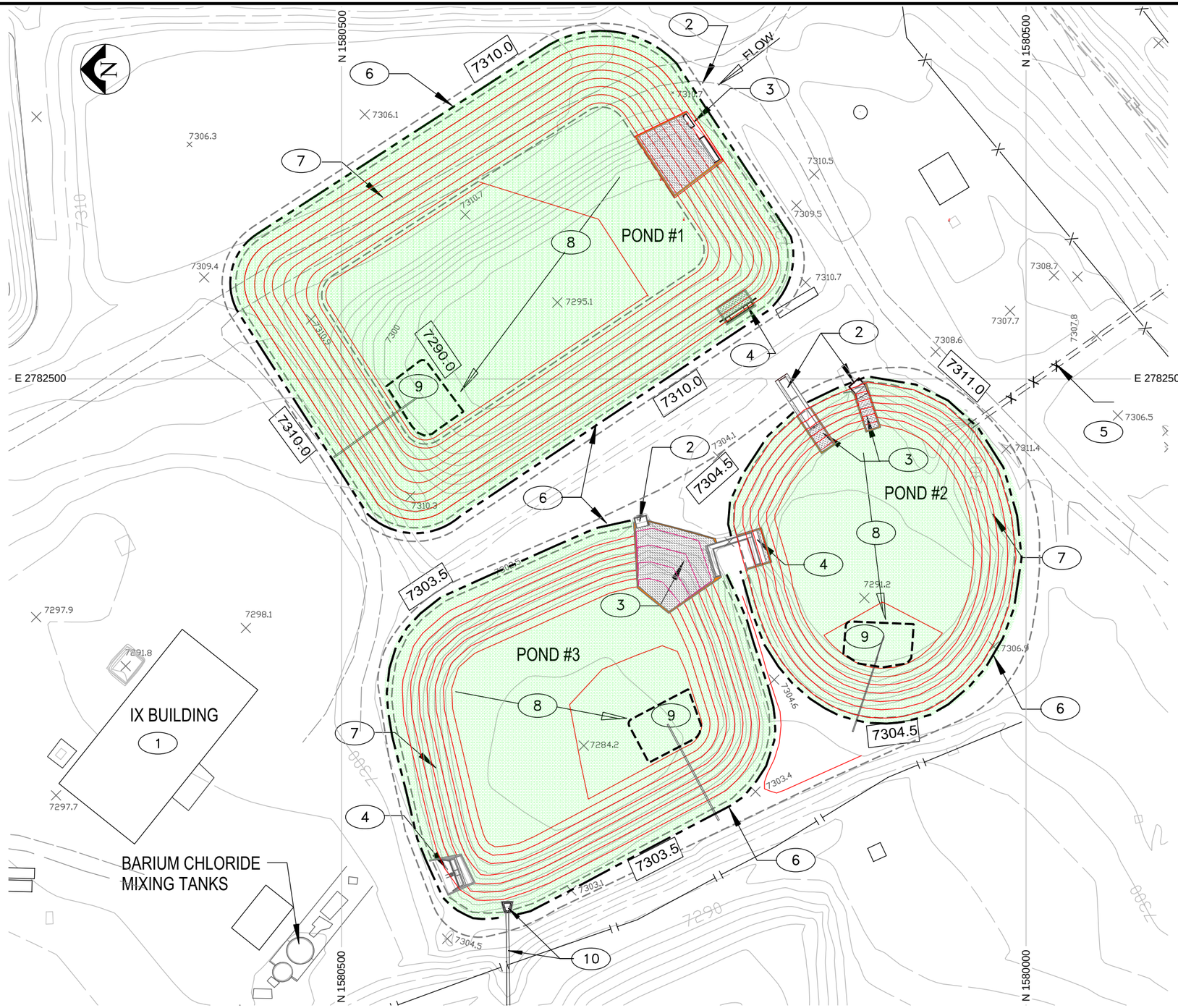
Prepared By: Alan Kuhn Associates LLC

SIZE: B | SCALE: As Shown | DWG NO. MT13-AC-02

PROJECT TITLE: MT. TAYLOR MINE
MINE REACTIVATION PLAN

SHEET TITLE: MINE WATER TREATMENT UNIT (MWTU) UPGRADES

REV: 1



NOTES

1. SEE APPENDIX D FOR IX PLANT DESIGN
2. EXISTING INLET HYDRAULIC STRUCTURES SEE SHEET MT13-AC-07
3. A/07 NEW INLET CONCRETE CURB AND SPILLWAYS
4. EXISTING OUTLET HYDRAULIC STRUCTURE WITH NEW CONCRETE CURB AND APRON
5. 48" DIA RCP STORM WATER PIPE TO BE REMOVED– STORM WATER FLOW TO BE REDIRECTED TO SOUTH STORM WATER RETENTION POND
6. A/06A MINUMUM 8' WIDE LEVEL BERM AT TOP OF POND FOR ANCHORING LINER – SLOPE TOP OF BERM 1% AWAY FROM ANCHOR TRENCH
7. POND SLOPES = 3H TO 1V
8. BOTTOM OF POND SLOPE 1% TOWARDS SUMP
9. LEAK DETECTION AND COLLECTION SYSTEM SUMP AND PIPE SEE DRAWING MT13-AC-06B FOR DETAILS
10. EXISTING OVERFLOW PROTECTION PIPE 26" DIA STEEL PIPE – FLOW TO POND #4 NMDOT STANDARD CONCRETE END SECTION

LEGEND

- 0000.0 — DESIGN ELEVATION
- 0000.0 — EXISTING SPOT ELEVATION
- TOP OF LINER – ANCHOR TRENCH
- TOP AND BOTTOM OF PONDS
- DOUBLE LINER AREA
- DESIGN TOPO LINES – TWO FOOT INTERVALS

NOT FOR CONSTRUCTION

MINE WATER TREATMENT SEDIMENTATION PONDS (PONDS 1, 2, AND 3)

500' GRID = NAD 83 NEW MEXICO WEST

0 40 80 120 160 FT
GRAPHIC SCALE

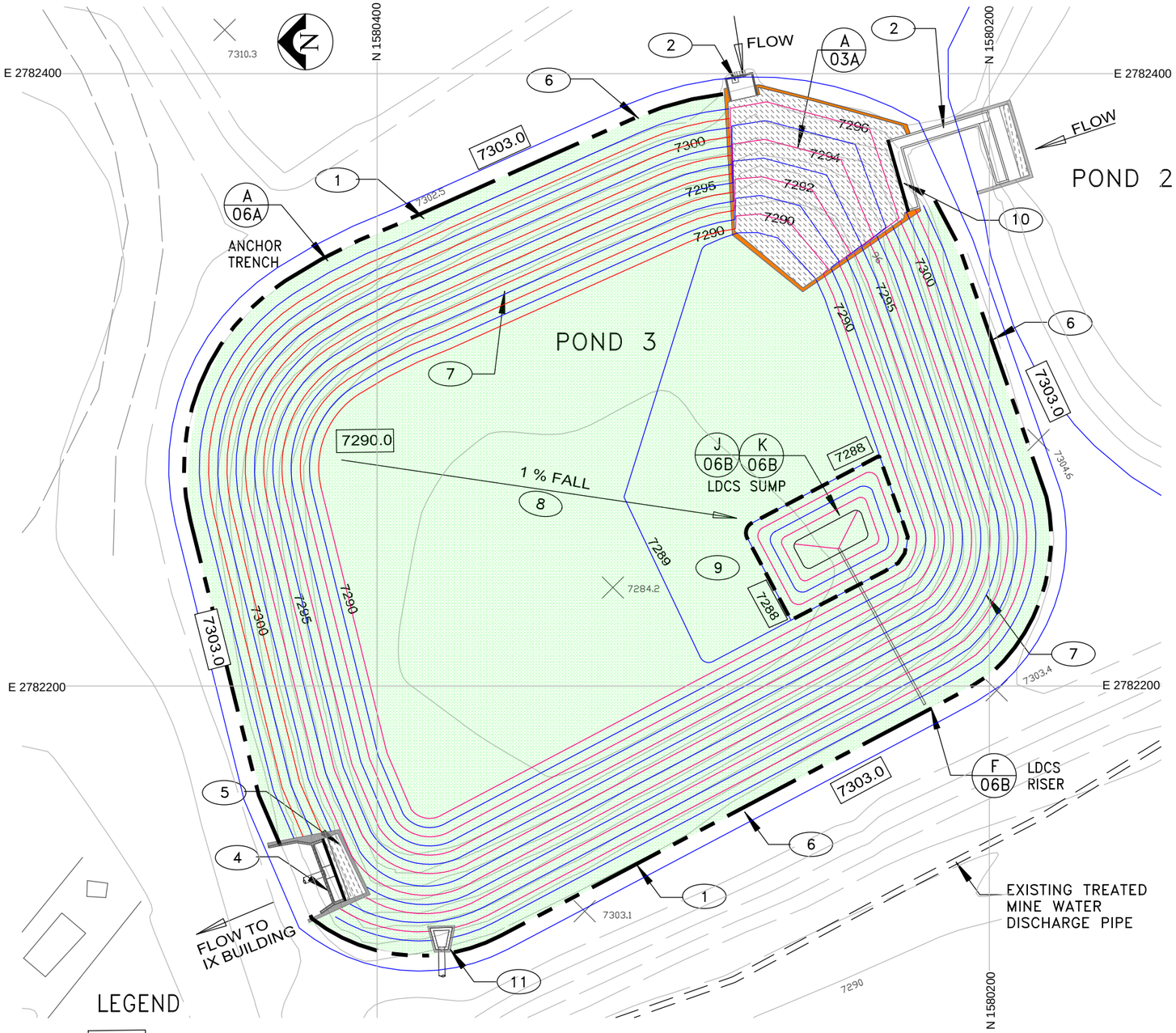
REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	AK

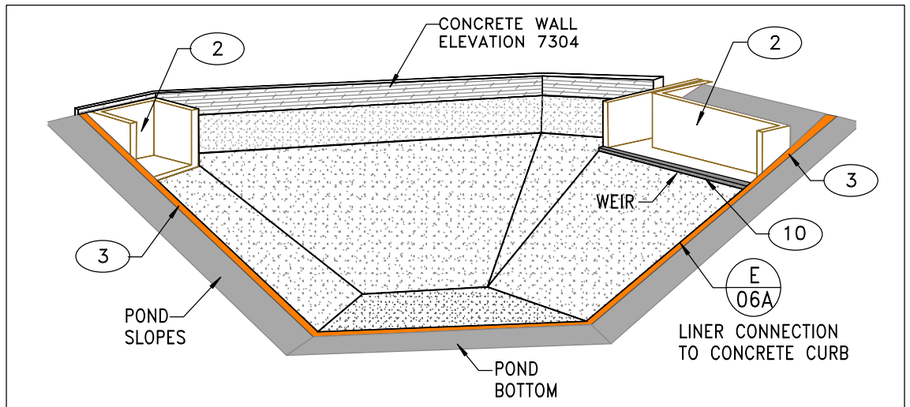
RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC
SIZE: B
SCALE: As Shown
DWG NO. MT13-AC-03

PROJECT TITLE: MT. TAYLOR MINE
MINE REACTIVATION PLAN

SHEET TITLE: MWTU SEDIMENTATION PONDS
REV: 0





A 03A POND #3 INLET SPILLWAY (ISOMETRIC VIEW)

NOT TO SCALE

LEGEND

- 0000.0 — DESIGN ELEVATION
- × 0000.0 — EXISTING SPOT ELEVATION
- TOP OF LINER – ANCHOR TRENCH
- C 06A — DOUBLE LINER AREA
- DESIGN TOPO LINES – ONE FOOT INTERVALS
  EVEN ELEVATIONS=RED, ODD = BLUE

0 20 40 FT
GRAPHIC SCALE

200' GRID = NAD 83 NEW MEXICO WEST

(POND #3 SHOWN AS EXAMPLE)

NOTES

1. EXTENT OF LINER AND ANCHOR TRENCH
2. EXISTING INLET HYDRAULIC STRUCTURES (MT13–AC–07)
3. NEW INLET CONCRETE CURB AND SPILLWAY
   SPILLWAY EXTENDS TO BOTTOM OF POND
4. EXISTING OUTLET HYDRAULIC STRUCTURE
5. NEW CONCRETE CURB AND APRON AROUND OUTLET STRUCTURES.
   EXTEND APRON TO ACCOMMODATE NEW GRADES
6. 8'–10' WIDE LEVEL BERM AT TOP OF POND FOR ANCHORING LINER
   SLOPE TOP 1% AWAY FROM ANCHOR TRENCH
7. SLOPES 3H TO 1V
8. BOTTOM OF POND SLOPE 1% TOWARDS SUMP
9. LEAK DETECTION AND COLLECTION SYSTEM (LDCS)
   SUMP AND RISER PIPE
   SEE DRAWING MT13–AC–06B FOR DETAILS
10. SPILLWAY ELEVATION AT TOP = 6" BELOW EXISTING WEIR ELEVATION
11. EXISTING OVERFLOW PROTECTION PIPE
    26" DIA STEEL PIPE – FLOW TO POND #4
    NMDOT STANDARD CONCRETE END SECTION

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

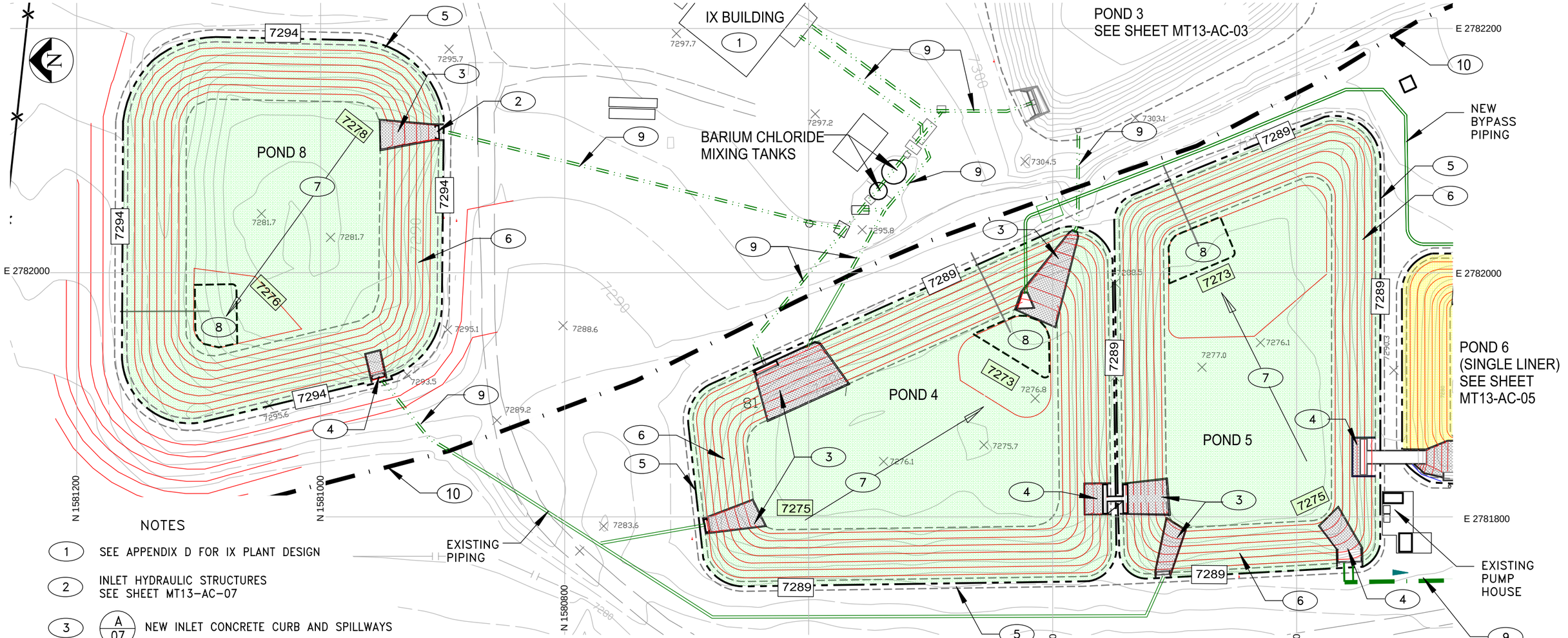
Prepared By: Alan Kuhn Associates LLC

SIZE B | SCALE: As Shown
DWG NO. MT13-AC-03A

PROJECT TITLE: MT. TAYLOR MINE
MINE REACTIVATION PLAN

SHEET TITLE: MWTU - PONDS
TYPICAL POND LAYOUT

REV 0



NOTES

1. SEE APPENDIX D FOR IX PLANT DESIGN
2. INLET HYDRAULIC STRUCTURES SEE SHEET MT13-AC-07
3. A/07 NEW INLET CONCRETE CURB AND SPILLWAYS
4. OUTLET HYDRAULIC STRUCTURE WITH NEW CONCRETE CURB AND APRON
5. A/06A MINUMUM 8' WIDE LEVEL BERM AT TOP OF POND FOR ANCHORING LINER – SLOPE TOP OF BERM 1% AWAY FROM ANCHOR TRENCH
6. POND SLOPES = 3H TO 1V
7. BOTTOM OF POND SLOPE 1% TOWARDS SUMP
8. LEAK DETECTION AND COLLECTION SYSTEM SUMP AND PIPE SEE DRAWING MT13-AC-06B FOR DETAILS
9. EXISTING UNDERGROUND PIPING
10. EXISTING TREATED MINE WATER DISCHARGE PIPE 24" DIA STEEL

200' GRID = NAD 83 NEW MEXICO WEST

0 40 80 FT 120 160 FT
GRAPHIC SCALE

LEGEND

- 0000.0 — DESIGN ELEVATION
- 0000.0 — EXISTING SPOT ELEVATION
- TOP OF LINER – ANCHOR TRENCH
- TOP AND BOTTOM OF PONDS
- DOUBLE LINER AREA
- DESIGN TOPO LINES – TWO FOOT INTERVALS

NOT FOR CONSTRUCTION

LOCATIONS OF UNDERGROUND PIPING SHOWN ON THIS PLAN ARE APPROXIMATE AND BASED ON HISTORICAL SCHEMATIC PLANS. ACTUAL PIPE LOCATIONS MAY DIFFER FROM WHAT IS SHOWN.

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	3-15-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

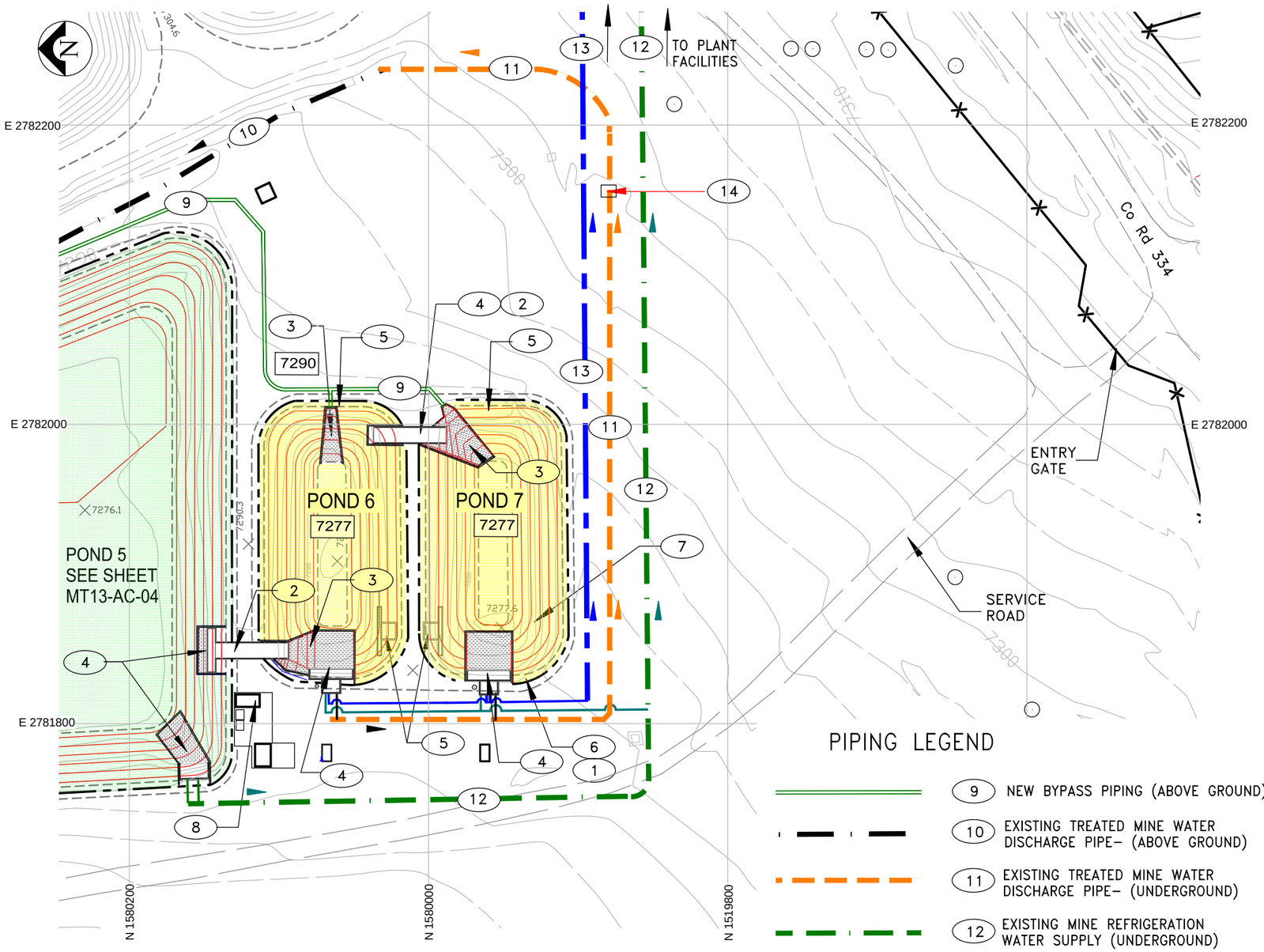
Prepared By: Alan Kuhn Associates LLC

SIZE: B
SCALE: As Shown
DWG NO. MT13-AC-04

PROJECT TITLE: **MT. TAYLOR MINE**
MINE REACTIVATION PLAN

SHEET TITLE: MWTU - IX PLANT AND RADIUM REMOVAL PONDS

REV: 0



NOTES

1. SINGLE HDPE 60 MIL LINER FOR PONDS 6 AND 7
2. EXISTING INLET HYDRAULIC STRUCTURES SEE SHEET MT13-AC-07
3. A/07 B/07 NEW INLET CONCRETE CURB AND SPILLWAYS
4. EXISTING OUTLET HYDRAULIC STRUCTURE WITH NEW CONCRETE CURB AND APRON
5. REMOVE OBSOLITE HYDRAULIC STRUCTURES AND FILL IN VOID
6. A/06A MINUMUM 8' WIDE LEVEL BERM AT TOP OF POND FOR ANCHORING LINER – SLOPE TOP OF BERM 1% AWAY FROM ANCHOR TRENCH
7. POND SLOPES = 3H TO 1V
8. EXISTING PUMP HOUSE AND ELECTRICAL TRANSFORMERS
9. NEW BYPASS PIPING FOR POND 5 (ABOVE GROUND)
10. EXISTING TREATED MINE WATER DISCHARGE PIPE 24" DIA STEEL (ABOVE GROUND)
11. EXISTING TREATED MINE WATER DISCHARGE PIPE 24" DIA STEEL (UNDERGROUND)
12. EXISTING MINE REFRIGERATION WATER SUPPLY (UNDERGROUND PIPE)
13. EXISTING PLANT WATER SUPPLY (UNDERGROUND PIPE)
14. EXISTING TREATED WATER FROM SANITARY TREATMENT PLANT (UNDERGROUND PIPE, OUTFALL 01A)

PIPING LEGEND

- 9 NEW BYPASS PIPING (ABOVE GROUND)
- 10 EXISTING TREATED MINE WATER DISCHARGE PIPE– (ABOVE GROUND)
- 11 EXISTING TREATED MINE WATER DISCHARGE PIPE– (UNDERGROUND)
- 12 EXISTING MINE REFRIGERATION WATER SUPPLY (UNDERGROUND)
- 13 EXISTING PLANT WATER SUPPLY (UNDERGROUND)

GENERAL LEGEND

- 0000 DESIGN ELEVATION
- 0000.0 EXISTING SPOT ELEVATION
- TOP OF LINER – ANCHOR TRENCH
- TOP AND BOTTOM OF PONDS
- DOUBLE LINER AREA (POND 5)
- SINGLE LINER AREA
- DESIGN TOPO LINES – TWO FOOT INTERVALS

NOT FOR CONSTRUCTION

LOCATIONS OF UNDERGROUND PIPING SHOWN ON THIS PLAN ARE APPROXIMATE AND BASED ON HISTORICAL SCHEMATIC PLANS. ACTUAL PIPE LOCATIONS MAY DIFFER FROM WHAT IS SHOWN.

0 40 80 FT 120 160 FT
GRAPHIC SCALE

200' GRID = NAD 83 NEW MEXICO WEST

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	3-15-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

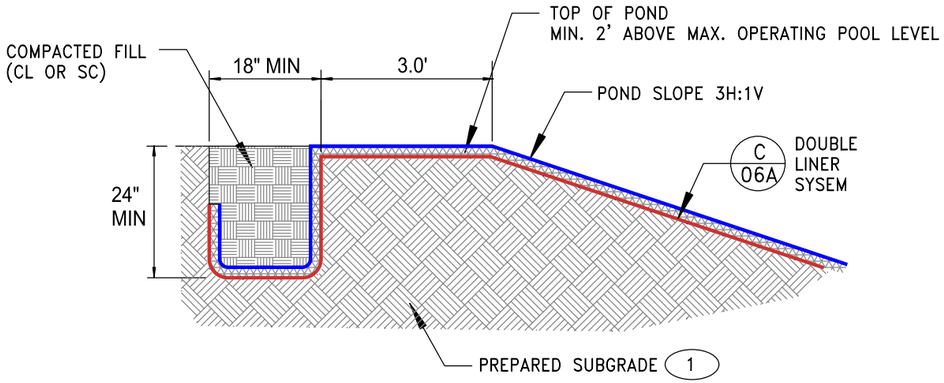
Prepared By: Alan Kuhn Associates LLC

SIZE B | SCALE: As Shown
DWG NO. MT13-AC-05

PROJECT TITLE: **MT. TAYLOR MINE**
MINE REACTIVATION PLAN

SHEET TITLE: MWTU- CLEAN WATER HOLDING PONDS AND DISTRIBUTION

REV 0

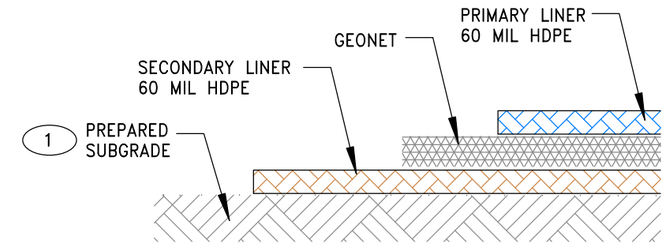


A TYPICAL INSLOPE AND ANCHOR TRENCH

NOT TO SCALE

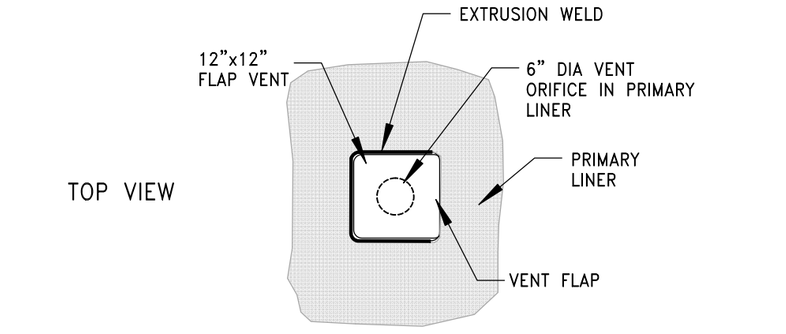
GENERAL NOTES

1 SUBGRADE TO BE GRADED AS SHOWN ON MT13-AC-03A TO PROVIDE A SMOOTH STABLE SURFACE FOR INSTALLATION OF THE LINER SYSTEM



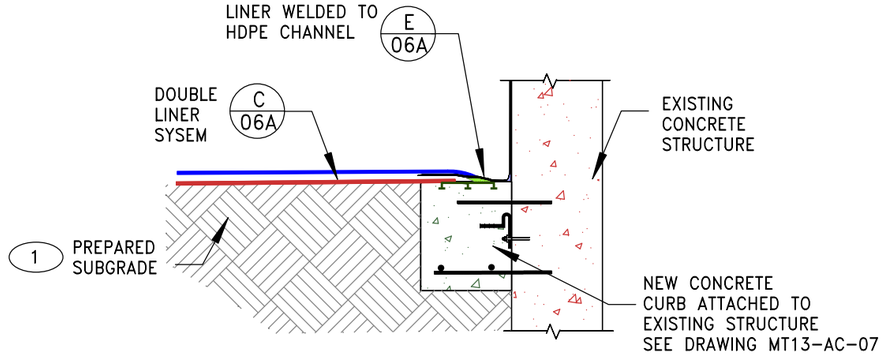
C DOUBLE LINER SYSTEM

NOT TO SCALE



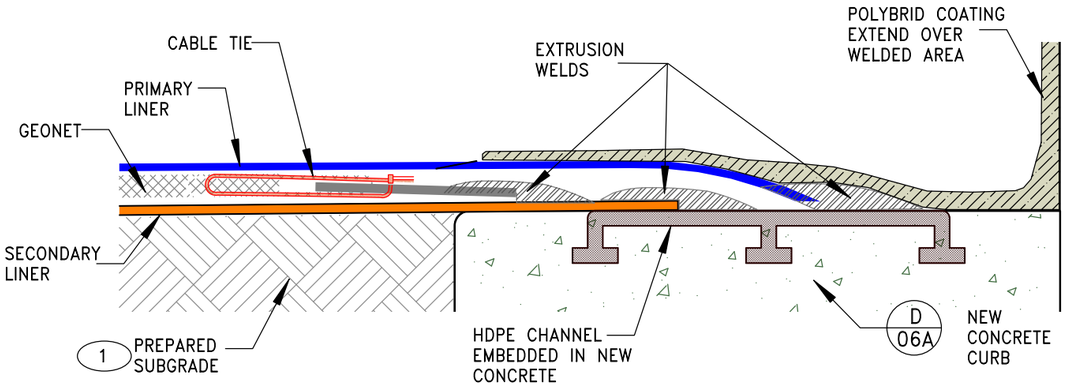
B LINER VENT DETAILS

NOT TO SCALE



D LINER CONNECTION TO CONCRETE STRUCTURES

NOT TO SCALE



E LINER CONNECTION TO HDPE CONCRETE INSERT

NOT TO SCALE

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC

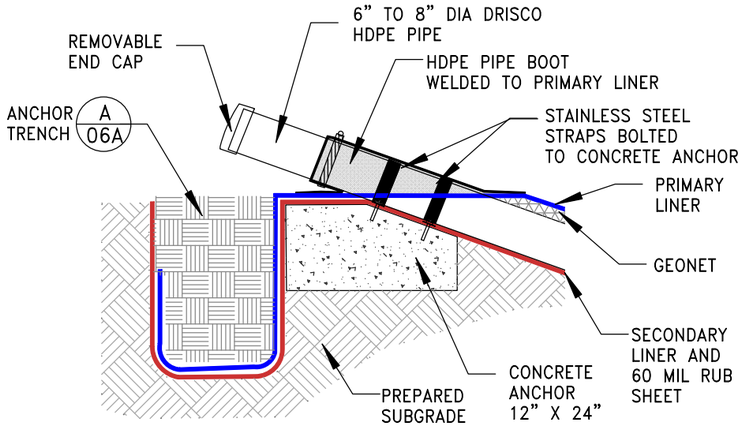
SIZE B | SCALE: Not To Scale

DWG NO. MT13-AC-06A

PROJECT TITLE: MT. TAYLOR MINE
MINE REACTIVATION PLAN

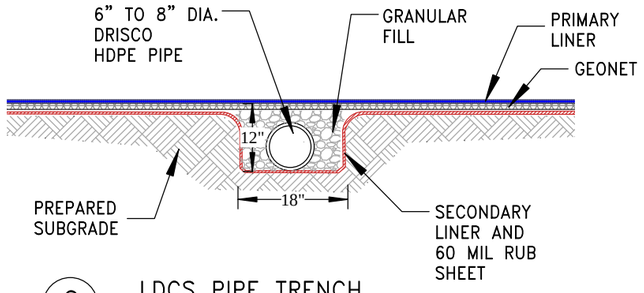
SHEET TITLE: POND LINER DETAILS-A

REV 0



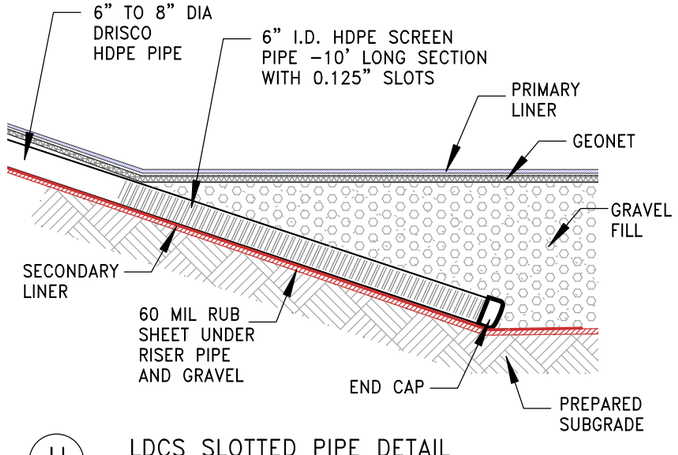
F LDCS RISER PIPE UPPER DETAIL

NOT TO SCALE



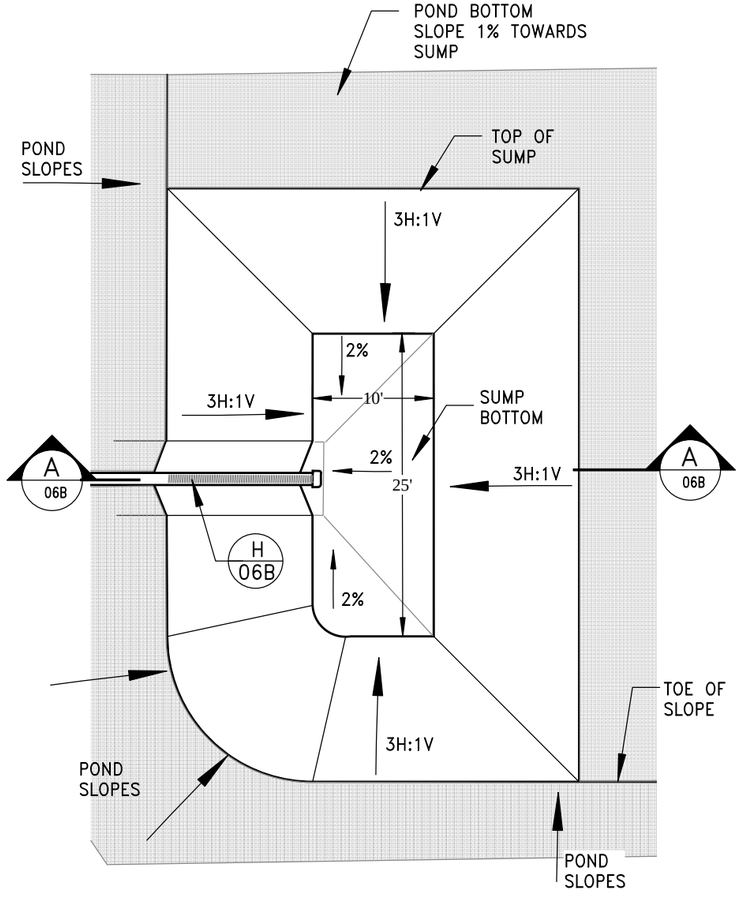
G LDCS PIPE TRENCH

NOT TO SCALE



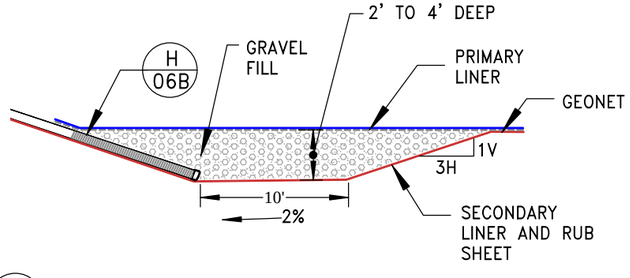
H LDCS SLOTTED PIPE DETAIL

NOT TO SCALE



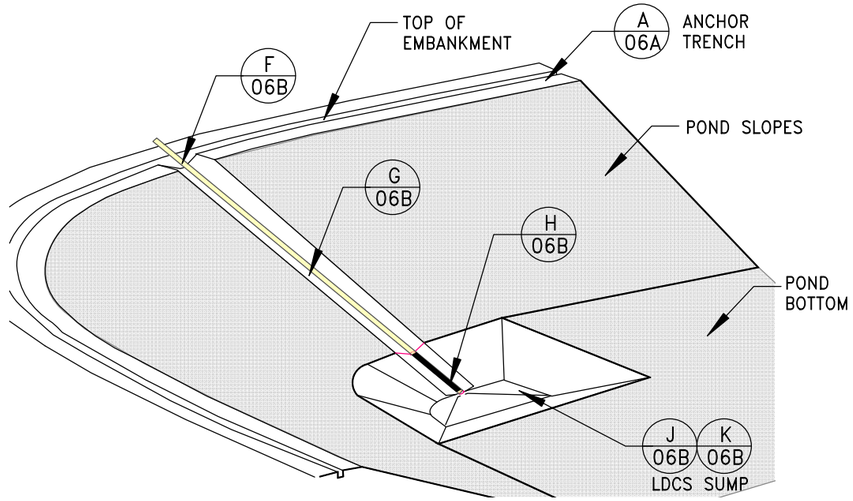
J LDCS SUMP – PLAN VIEW

NOT TO SCALE



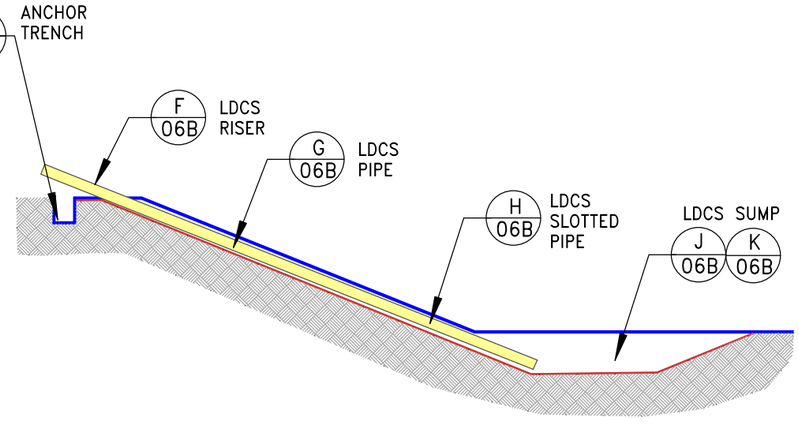
K LDCS SUMP – SECTION A–A

NOT TO SCALE



KEY DRAWING – ISOMETRIC VIEW OF LDCS SYSTEM

NOT TO SCALE



LDCS SYSTEM SECTION VIEW

NOT TO SCALE

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	3-15-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC

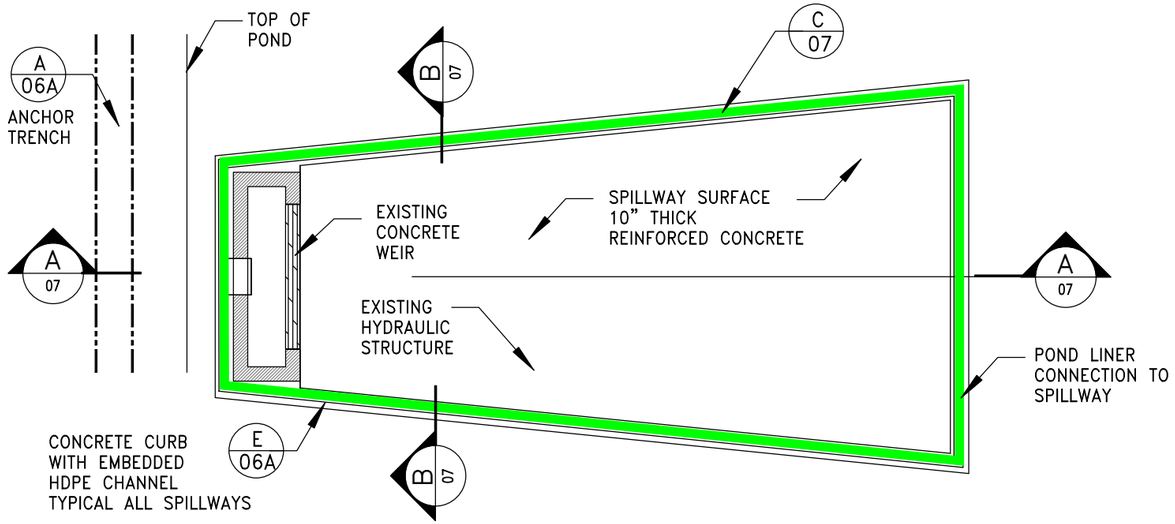
SIZE B | SCALE: Not To Scale

DWG NO. MT13-AC-06B

PROJECT TITLE: MT. TAYLOR MINE
MINE REACTIVATION PLAN

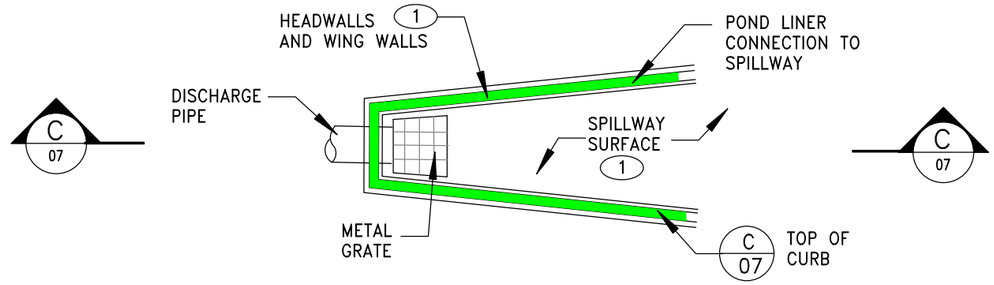
SHEET TITLE: POND LINER DETAILS - B

REV 0



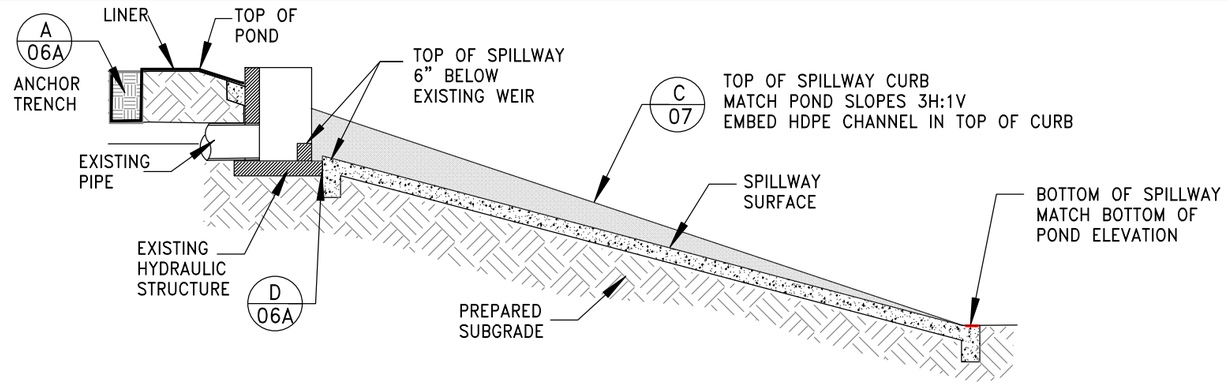
A TYPICAL SPILLWAY AT EXISTING HYDRAULIC STRUCTURE

NOT TO SCALE



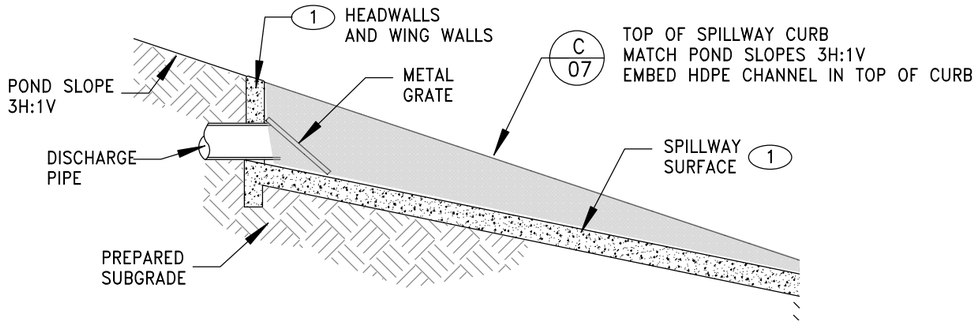
B TYPICAL SPILLWAY AT SINGLE PIPE ENTRANCE

NOT TO SCALE



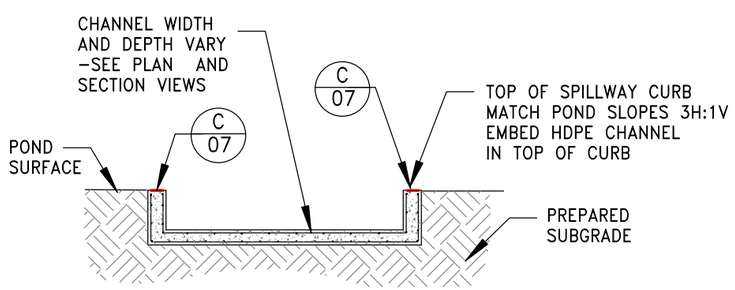
SECTION AA TYPICAL SPILLWAY

NOT TO SCALE

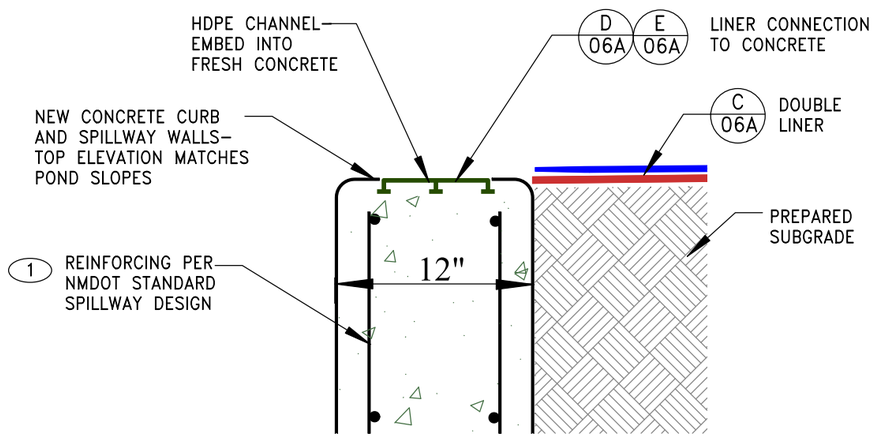


SECTION CC TYPICAL SPILLWAY AT SINGLE PIPE ENTRANCE

NOT TO SCALE



SECTION BB – TYPICAL SPILLWAY CROSS SECTION



C TYPICAL CONCRETE CURB AND SPILLWAY WALL

NOT TO SCALE

1 FOR CONSTRUCTION DETAILS ON ALL SPILLWAYS, HEADWALLS AND WINGWALLS FOLLOW NMDOT STANDARD DETAILS

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	3-15-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION

MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC

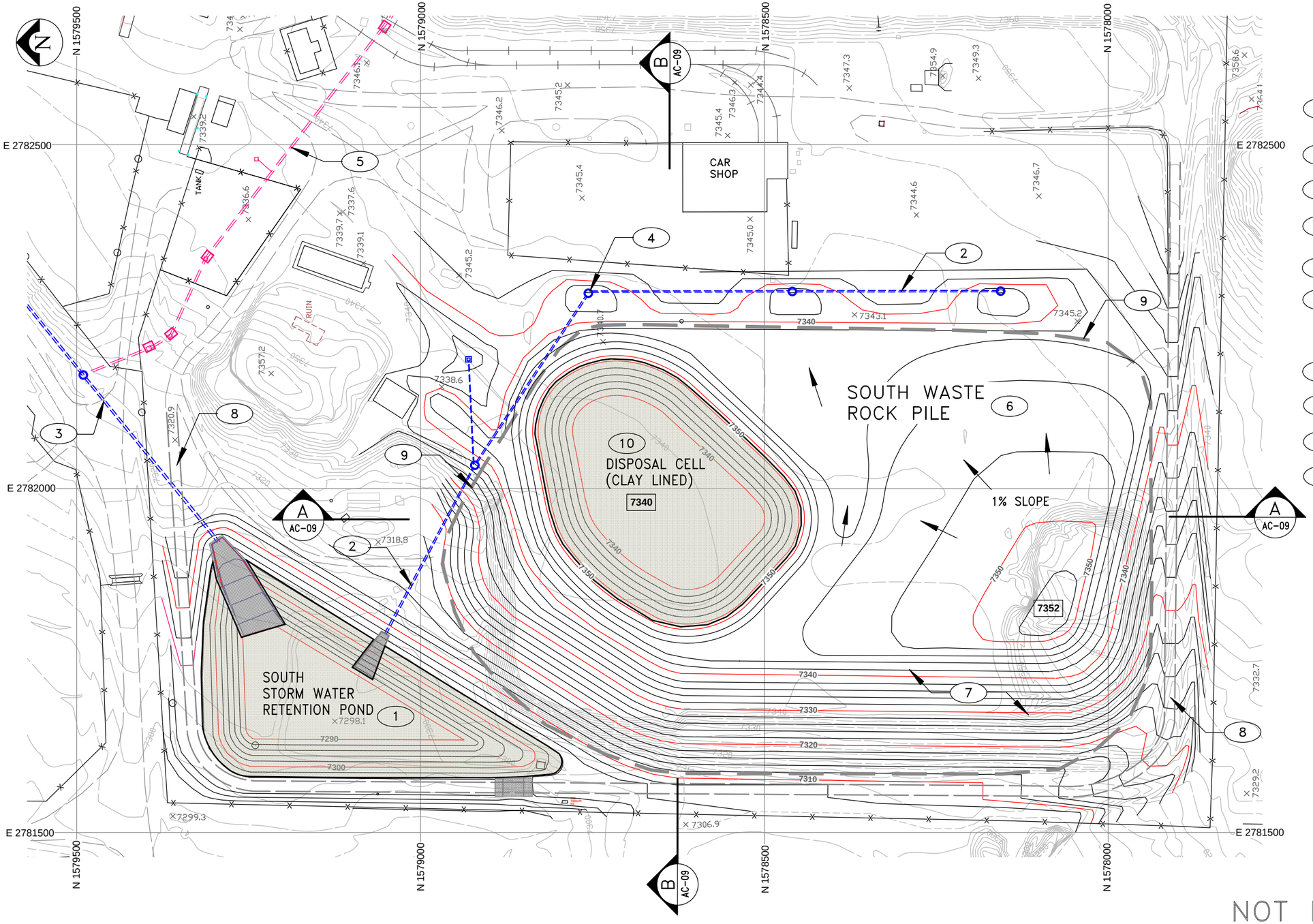
SIZE B | SCALE: As Shown

DWG NO. MT13-AC-07

PROJECT TITLE: MT. TAYLOR MINE
MINE REACTIVATION PLAN

SHEET TITLE: HYDRAULIC CONTROL STRUCTURES MODIFICATION DETAILS

REV 0



NOTES:

1. SOUTH STORM WATER RETENTION POND (SEE MT13 AC-16)
2. NEW DRAINAGE PIPE 24" DIA CMP
3. NEW DRAINAGE PIPE 36" DIA CMP
4. CONCRETE MANHOLES 48" DIA W/ INLET COVERS
5. EXISTING DRAINAGE PIPE 36" DIA CMP
6. WASTE ROCK PILE AT REACTIVATION STAGE SHOWING POND SEDIMENT DISPOSAL CELL. CONTOURS SHOWN AT 2' INTERVALS.
7. WASTE ROCK PILE SLOPES = 5H TO 1V
8. SERVICE ROAD
9. PERIMETER OF WASTE ROCK PILE
10. CLAY LINED DISPOSAL CELL FOR POND SEDIMENT. TOP OF BERM = 7350'

LEGEND

- 7290 — DESIGN SPOT ELEVATIONS
- DESIGN CONTOURS (2 FOOT INTERVALS)
- EXISTING CONTOURS (2 FOOT INTERVALS)
- NEW DRAINAGE PIPES
- CONCRETE SPILLWAYS
- CLAY LINER AREA

NOT FOR CONSTRUCTION

0 150 300 FT
GRAPHIC SCALE

500' GRID = NAD 83 NEW MEXICO WEST

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	AK
1	2013 Review Comments	12-17-13	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC

SIZE: B | SCALE: As Shown | DWG NO.: MT13-AC-08

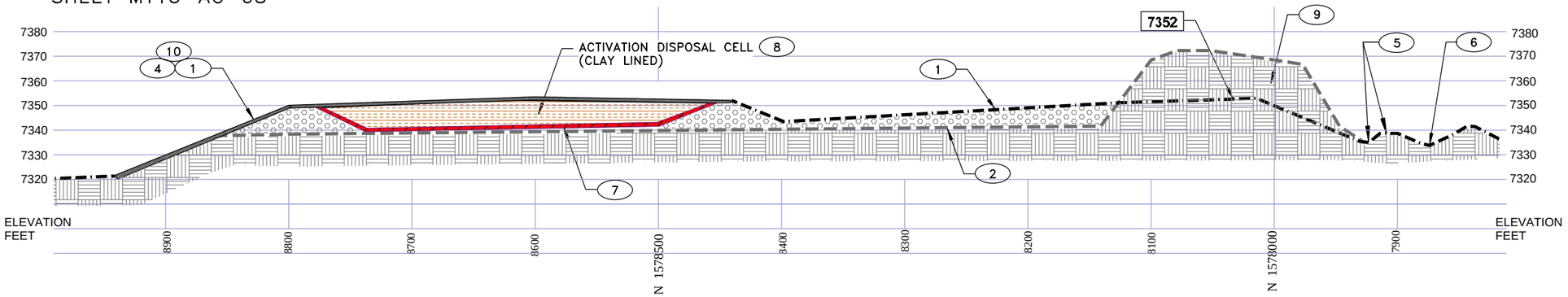
PROJECT TITLE: **MT. TAYLOR MINE**
MINE REACTIVATION PLAN

SHEET TITLE: SOUTH WASTE ROCK PILE AT MINE REACTIVATION - PLAN VIEW

REV: 1

SECTION A–A' (12)

SHEET MT13–AC–08

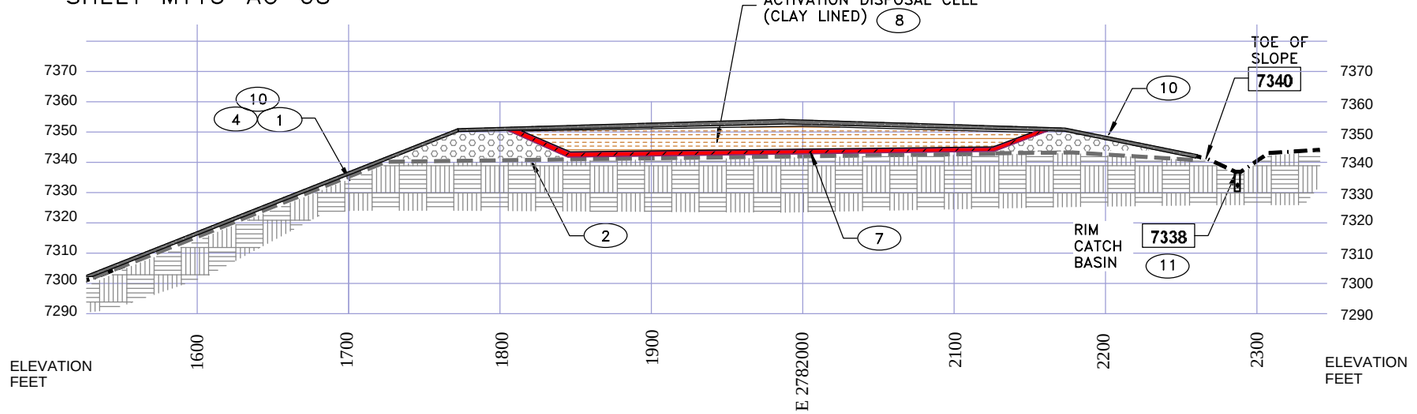


SCALE: AS SHOWN BY GRID
(VERTICAL SCALE = 2X HORIZONTAL SCALE)

GRID = NAD 83 NEW MEXICO WEST

SECTION B–B' (12)

SHEET MT13–AC–08



SCALE: AS SHOWN BY GRID
(VERTICAL SCALE = 2X HORIZONTAL SCALE)

GRID = NAD 83 NEW MEXICO WEST

NOTES:

(1) FINAL GRADES AT REACTIVATION.

(2) EXISTING GRADES

(3) WASTE ROCK FROM MINE, CONTAMINATED SOIL AND DEMOLITION DEBRIS

(4) FINISH SLOPES OF WASTE ROCK PILE – 5H TO 1V MAXIMUM WITH 2 FEET OF CLEAN SOIL COVER PLACED CONTEMPORANEOUSLY ON PILE SLOPES.

(5) CONTAINMENT BERM AND DRAINAGE SWALE AT TOE OF SLOPE

(6) EXISTING DIVERSION CHANNEL

(7) CLAY LINER – 1FT THICK MINIMUM

(8) CLAY LINED DISPOSAL CELL FOR POND SEDIMENTS. SEE MT13–CL–08

(9) SHAFT MUCK PILE– TO BE USED FOR THE COVER SOILS PLACED ON THE WASTE ROCK PILE.

(10) REVEGETATE ALL DISTURBED AREAS EXCEPT THE SOUTH STORM WATER RETENTION POND

(11) NEW STORM WATER DRAINAGE SYSTEM MANHOLES AND DRAINAGE PIPES

(12) FOR CONSTRUCTION, PLACEMENT, AND MATERIAL REQUIREMENTS SEE PROJECT EARTHWORK SPECIFICATION NUMBER C.4

LEGEND

LEGEND

- 2' THICK COVER SOIL OVER CONTAMINATED FILL
- WASTE ROCK – CONTAMINATED SOIL OR BUILDING DEBRIS
- EXISTING GRADES
- CLAY LINER
- MINE REACTIVATION GRADE

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	3-15-13	EL	AK	AK
1	2013 Review Comments	12-17-13	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

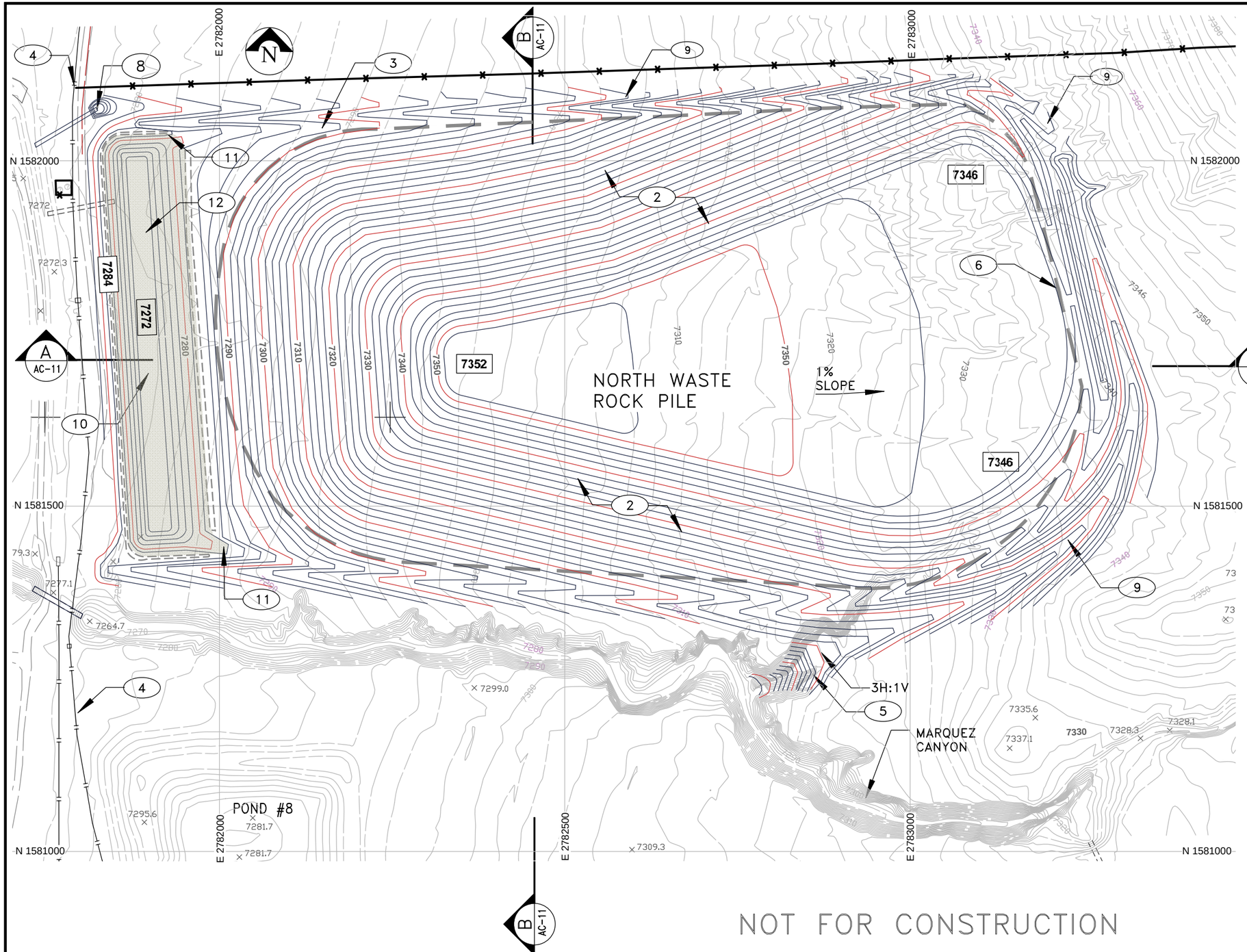
Prepared By: Alan Kuhn Associates LLC

SIZE B | SCALE: AS NOTED | DWG NO. MT13-AC-09

PROJECT TITLE: MT. TAYLOR MINE
MINE REACTIVATION PLAN

SHEET TITLE: SOUTH WASTE ROCK PILE AT MINE REACTIVATION - SECTIONS

REV 1



NOTES:

1. WASTE ROCK PILE AT FINAL BUILDOUT CONTOURS SHOWN AT 2' INTERVALS
2. WASTE ROCK PILE SLOPES = 5H TO 1V
3. DRAINAGE SWALE AT TOE OF SLOPE
4. TREATED WATER PIPELINE
5. RIP RAP WHERE DRAINAGE SWALES FLOW INTO MARQUEZ CANYON
6. PERIMETER OF WASTE ROCK PILE
7. WASTE ROCK PILE TO RECEIVE 2' MIN. CLEAN SOIL COVER CONTEMPORANEOUSLY
8. NEW 2' DIA CMP CULVERT INVERT = 7273
9. OUTER DRAINAGE SWALES TO DIVERT RUNOFF FROM MESA
10. STORM WATER RETENTION BASIN FOR RUNOFF FROM WASTE ROCK PILE –
    TOP OF EMBANKMENT ELEVATION = 7284'
    HIGH WATER ELEVATION = 7282'
    BOTTOM OF POND ELEVATION = 7272'
11. RIP RAP AT CHANNEL ENTRANCE TO STORM WATER RETENTION BASIN
12. CLAY LINER – 1 FT THICK MINIMUM

LEGEND

- 0000 — DESIGN SPOT ELEVATIONS
- DESIGN CONTOURS (2 FOOT INTERVALS)
- EXISTING CONTOURS (2 FOOT INTERVALS)
- FENCELINE
- TREATED WATER PIPELINE
- TOP OF STORM WATER RETENTION BASIN
- CLAY LINER

0 150 300 FT
GRAPHIC SCALE

500' GRID = NAD 83 NEW MEXICO WEST

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

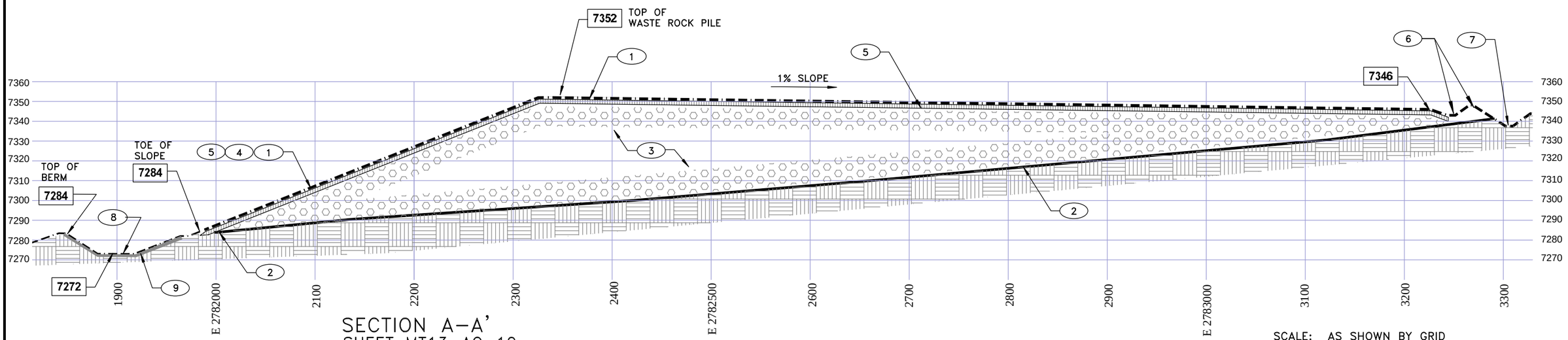
Prepared By: Alan Kuhn Associates LLC

SIZE: B | SCALE: As Shown
DWG NO.: MT13-AC-10

PROJECT TITLE: **MT. TAYLOR MINE**
MINE REACTIVATION PLAN

SHEET TITLE: NORTH WASTE ROCK PILE BUILDOUT PLAN VIEW

REV: 0



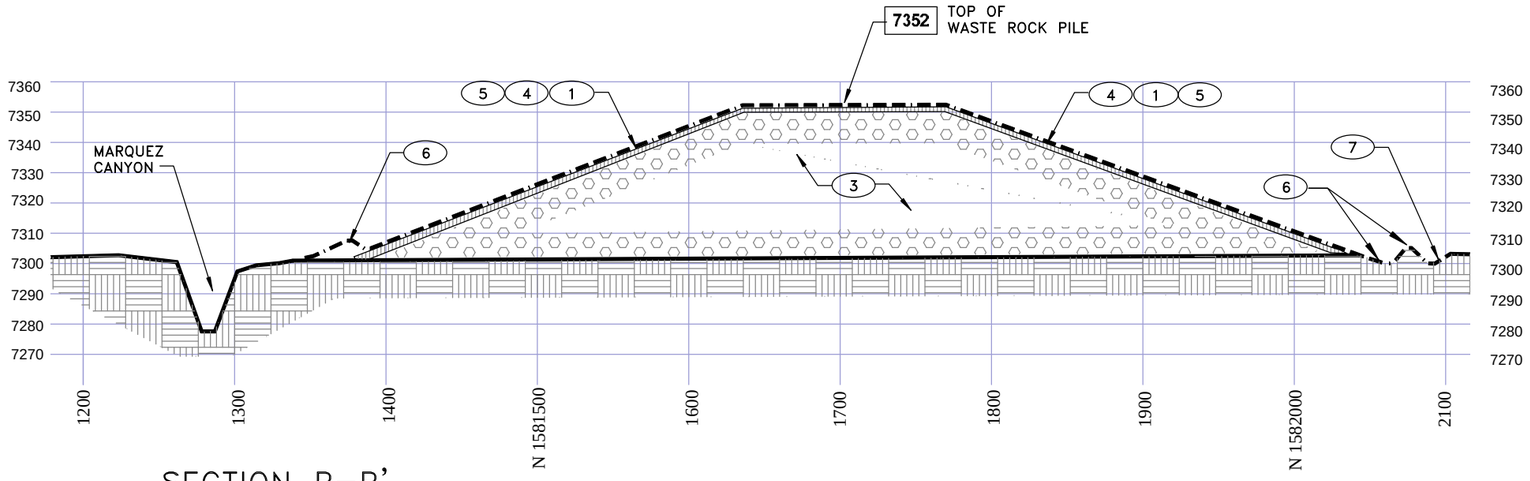
SECTION A–A'
SHEET MT13–AC–10

SCALE: AS SHOWN BY GRID
(VERTICAL SCALE = 2X HORIZONTAL SCALE)

GRID = NAD 83 NEW MEXICO WEST

NOTES:

1. FINAL GRADES AT FULL BUILDOUT
2. EXISTING GRADES
3. WASTE ROCK FROM MINE
4. FINISH SLOPES OF WASTE ROCK PILE – 5H TO 1V MAXIMUM.
5. TWO FEET OF CLEAN SOIL COVER PLACED CONTEMPORANEOUSLY ON PILE SLOPES
6. CONTAINMENT BERM AND DRAINAGE SWALE
7. DIVERSION CHANNEL TO DIVERT MESA RUNOFF AWAY FROM PILE
8. STORM WATER RETENTION BASIN FOR RUNOFF FROM WASTE ROCK PILE –
   TOP OF BERM ELEVATION = 7284'
   BOTTOM OF BASIN ELEVATION = 7272'
9. CLAY LINER – 1FT THICK MINIMUM



SECTION B–B'
SHEET MT13–AC–10

SCALE: AS SHOWN BY GRID
(VERTICAL SCALE = 2X HORIZONTAL SCALE)

GRID = NAD 83 NEW MEXICO WEST

LEGEND

- 0000 DESIGN SPOT ELEVATION
- EXISTING GRADE
- FINAL GRADE
- WASTE ROCK

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	3-15-13	EL	AK	AK
1	Correct Elevation	12-17-13	EL	AK	

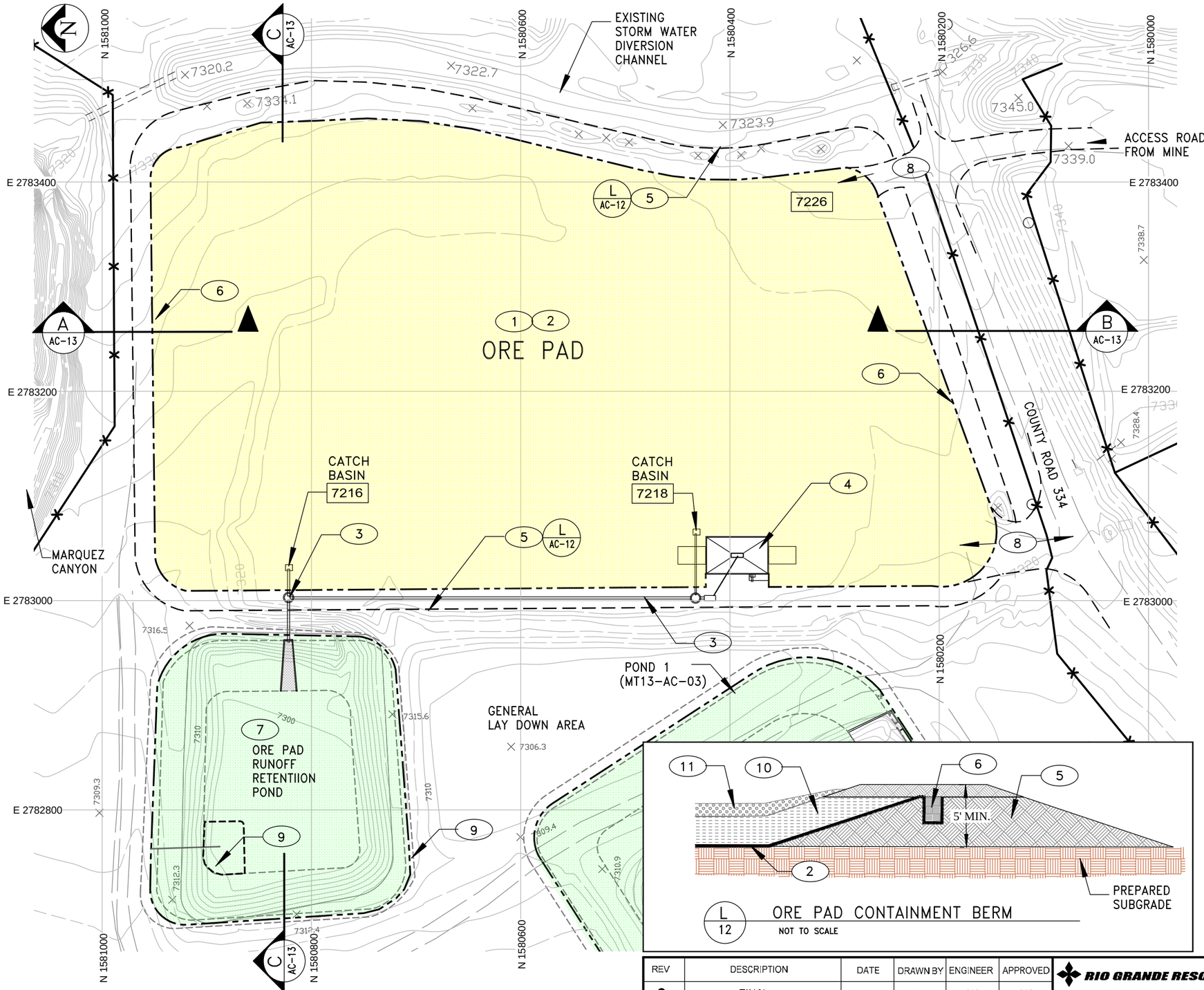
RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC
SIZE: B
SCALE: AS NOTED
DWG NO.: MT13-AC-11

PROJECT TITLE: **MT. TAYLOR MINE**
MINE REACTIVATION PLAN

SHEET TITLE: NORTH WASTE ROCK PILE BUILDOUT SECTIONS

REV: 1



L 12 ORE PAD CONTAINMENT BERM
NOT TO SCALE

NOTES

1. ORE PAD FINAL GRADED TO SLOPE 1% TOWARDS CATCH BASINS
2. ORE PAD LINER – 60 MIL HDPE
3. STORM WATER SYSTEM– PIPING AND MANHOLES SEE DRAWING MT13–AC–15
4. TRUCK WASH AREA CONCRETE PAVED AREA TO DRAIN TO CENTER DRAIN SEE DRAWING MT13–AC–15
5. L/12 CONTAINMENT BERM AROUND PERIMETER OF ORE PAD – COMPACTED FILL
6. A/06A PERIMETER OF ORE PAD LINER / ANCHOR TRENCH
7. ORE PAD RUNOFF RETENTION POND SEE DRAWING MT13–AC–15
8. ORE TRUCK ENTRY AND EXIT LOCATIONS
9. TOP ELEVATION 7314 BOTTOM OF POND ELEVATION 7300
10. 1.5 FT. MINIMUM COMPACTED FILL (CL OR SC)
11. 1.0 FT. MINIMUM CRUSHED SANDSTONE OR GRAVEL

LEGEND

- 0000.0 — DESIGN ELEVATION
- × 0000.0 — EXISTING SPOT ELEVATION
- PERIMETER OF ORE PAD CONTAINMENT BERM
- TOP OF LINER – ANCHOR TRENCH
- TOP AND BOTTOM OF PONDS
- C/06A — DOUBLE LINER AREA
- SINGLE LINER AREA

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC

SIZE B | SCALE: As Shown | DWG NO. MT13-AC-12

PROJECT TITLE: **MT. TAYLOR MINE**
MINE REACTIVATION PLAN

SHEET TITLE: ORE PAD AND APPURTENANT FACILITIES - PLAN VIEW

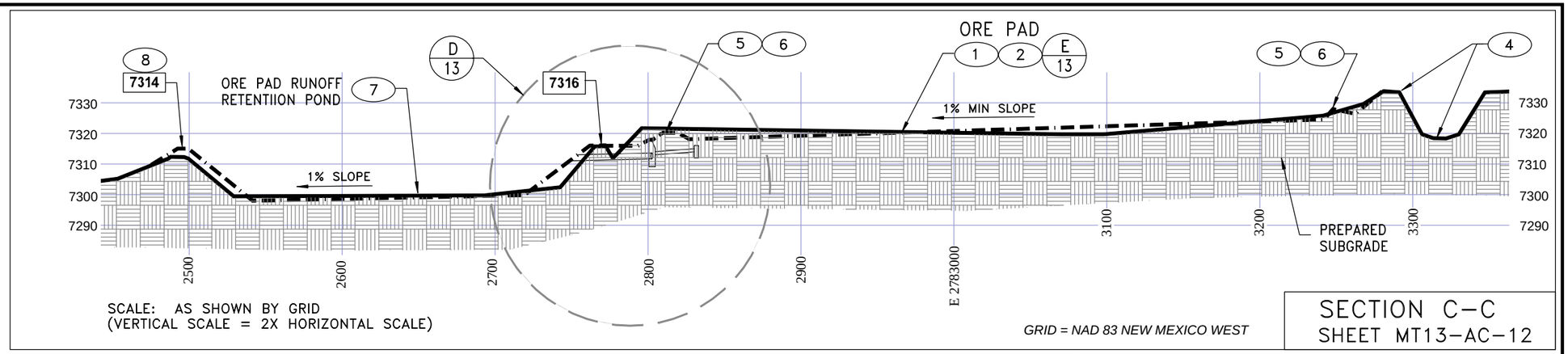
REV 0

NOTES

1. ORE PAD FINAL GRADED TO SLOPE 1% TOWARDS CATCH BASINS
2. ORE PAD LINER – 60 MIL HDPE
3. NEW STORM WATER SYSTEM– PIPING AND MANHOLES– SEE DRAWING MT13–AC–15
4. EXISTING DIVERSION CHANNEL AND BERM
5. L/12 CONTAINMENT BERM AROUND PERIMETER OF ORE PAD
6. A/06A PERIMETER OF ORE PAD LINER AND ANCHOR TRENCH
7. ORE PAD RUNOFF RETENTION POND SEE DRAWING MT13–AC–15
8. BERM ELEVATION = 7314 BOTTOM OF POND ELEVATION = 7298
9. 1.5 FT. MINIMUM COMPACTED FILL (CL OR SC)
10. 1.0 FT. MINIMUM CRUSHED SANDSTONE OR GRAVEL
11. HDPE LINER TO BE WELDED TO CATCHBASIN WALLS
12. NEW END SECTION AND SPILLWAY

LEGEND

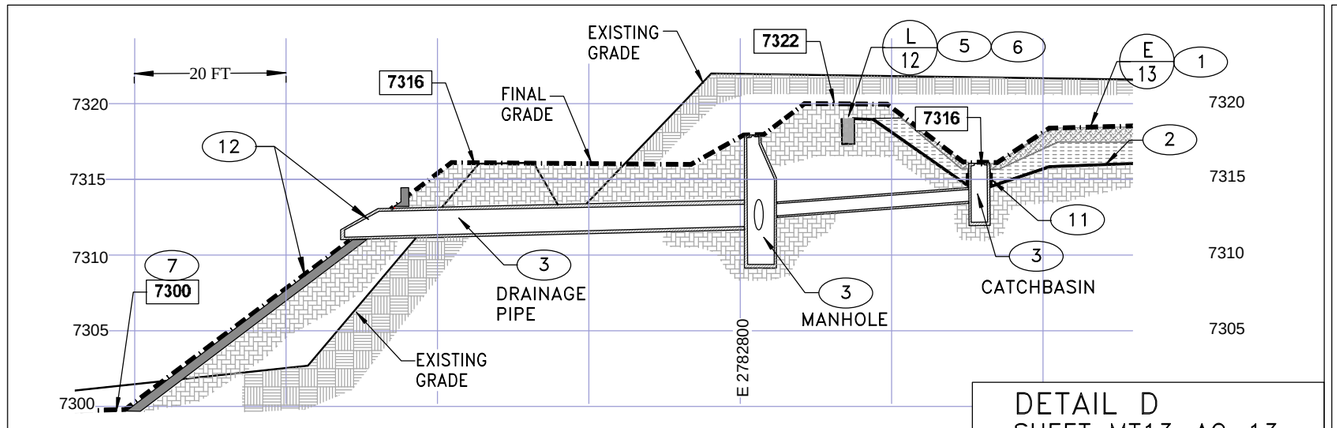
- 0000 DESIGN SPOT ELEVATION
- EXISTING GRADE
- FINAL GRADE



SCALE: AS SHOWN BY GRID
(VERTICAL SCALE = 2X HORIZONTAL SCALE)

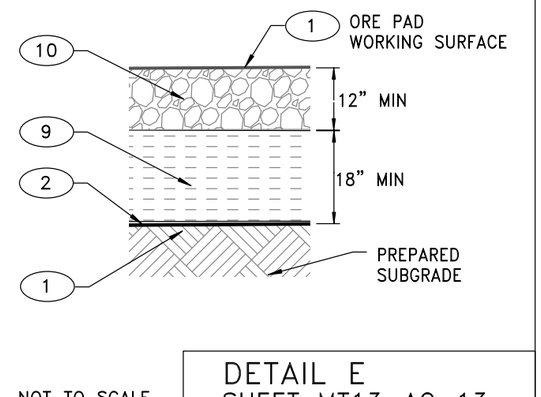
GRID = NAD 83 NEW MEXICO WEST

SECTION C–C
SHEET MT13–AC–12



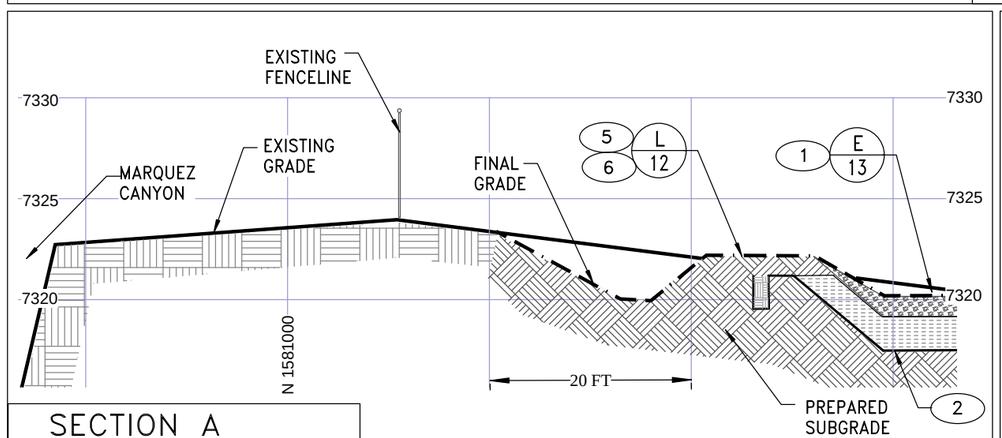
SCALE: AS SHOWN BY GRID

DETAIL D
SHEET MT13–AC–13



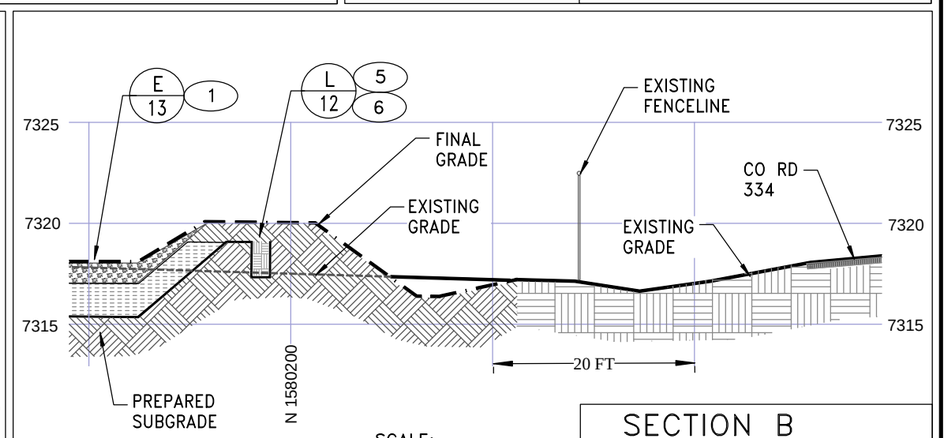
NOT TO SCALE

DETAIL E
SHEET MT13–AC–13



SECTION A
SHEET MT13–AC–12

SCALE: AS SHOWN BY GRID



SCALE: AS SHOWN BY GRID

SECTION B
SHEET MT13–AC–12

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	3-15-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC

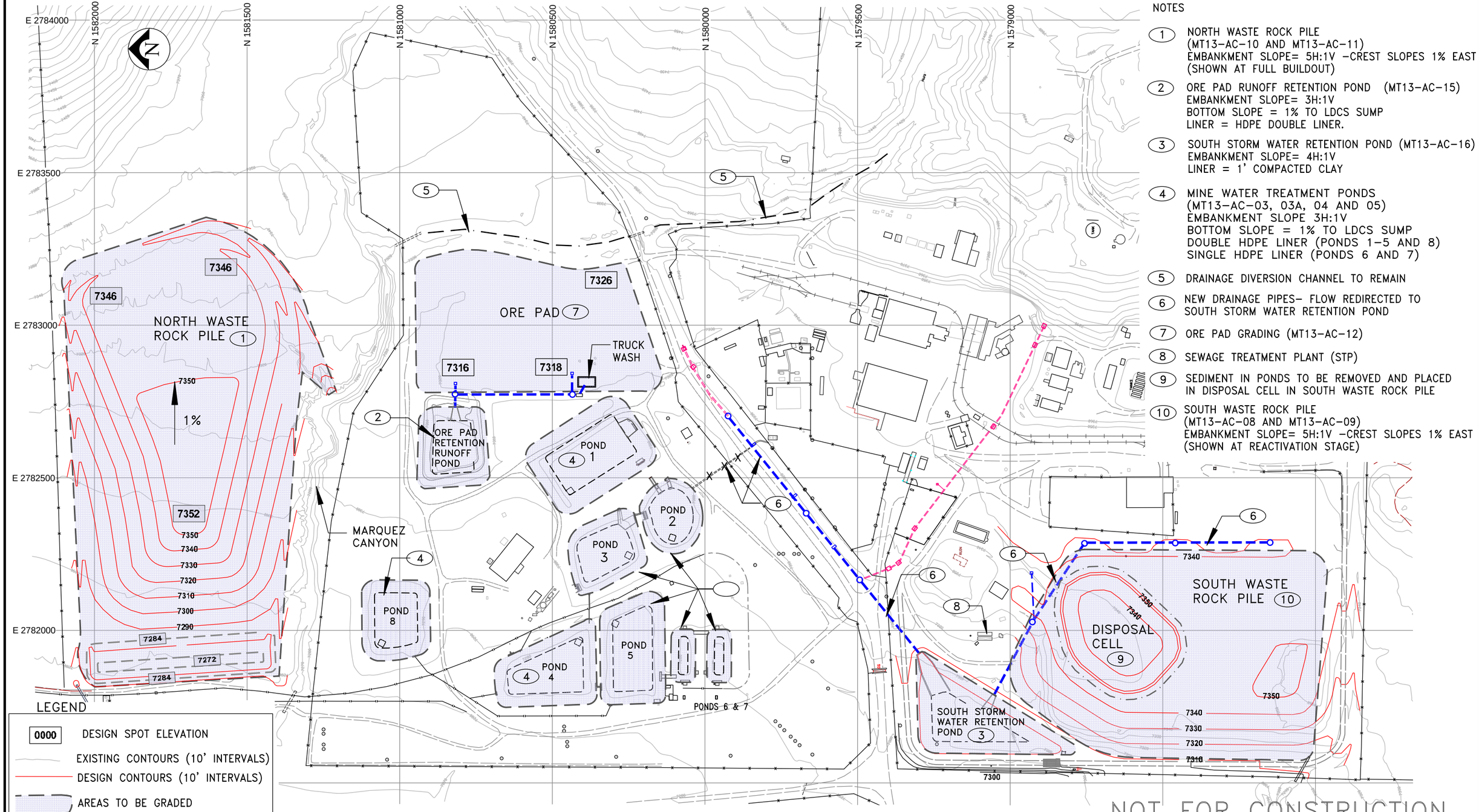
SIZE: B | SCALE: AS NOTED

DWG NO.: **MT13-AC-13**

PROJECT TITLE: **MT. TAYLOR MINE**
MINE REACTIVATION PLAN

SHEET TITLE: ORE PAD AND APPURTENANT FACILITIES - SECTIONS

REV: **0**



NOTES

1. NORTH WASTE ROCK PILE (MT13-AC-10 AND MT13-AC-11) EMBANKMENT SLOPE= 5H:1V -CREST SLOPES 1% EAST (SHOWN AT FULL BUILDOUT)
2. ORE PAD RUNOFF RETENTION POND (MT13-AC-15) EMBANKMENT SLOPE= 3H:1V BOTTOM SLOPE = 1% TO LDCS SUMP LINER = HDPE DOUBLE LINER.
3. SOUTH STORM WATER RETENTION POND (MT13-AC-16) EMBANKMENT SLOPE= 4H:1V LINER = 1' COMPACTED CLAY
4. MINE WATER TREATMENT PONDS (MT13-AC-03, 03A, 04 AND 05) EMBANKMENT SLOPE 3H:1V BOTTOM SLOPE = 1% TO LDCS SUMP DOUBLE HDPE LINER (PONDS 1-5 AND 8) SINGLE HDPE LINER (PONDS 6 AND 7)
5. DRAINAGE DIVERSION CHANNEL TO REMAIN
6. NEW DRAINAGE PIPES- FLOW REDIRECTED TO SOUTH STORM WATER RETENTION POND
7. ORE PAD GRADING (MT13-AC-12)
8. SEWAGE TREATMENT PLANT (STP)
9. SEDIMENT IN PONDS TO BE REMOVED AND PLACED IN DISPOSAL CELL IN SOUTH WASTE ROCK PILE
10. SOUTH WASTE ROCK PILE (MT13-AC-08 AND MT13-AC-09) EMBANKMENT SLOPE= 5H:1V -CREST SLOPES 1% EAST (SHOWN AT REACTIVATION STAGE)

LEGEND

- 0000 DESIGN SPOT ELEVATION
- EXISTING CONTOURS (10' INTERVALS)
- DESIGN CONTOURS (10' INTERVALS)
- AREAS TO BE GRADED
- EXISTING DRAINAGE PIPES
- NEW DRAINAGE PIPES
- TREATED MINE WATER PIPE LINE
- FENCE LINE

0 300 600 FT
GRAPHIC SCALE

500' GRID = NAD 83 NEW MEXICO WEST

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	AK
1	2013 Review Comments	03-15-13	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

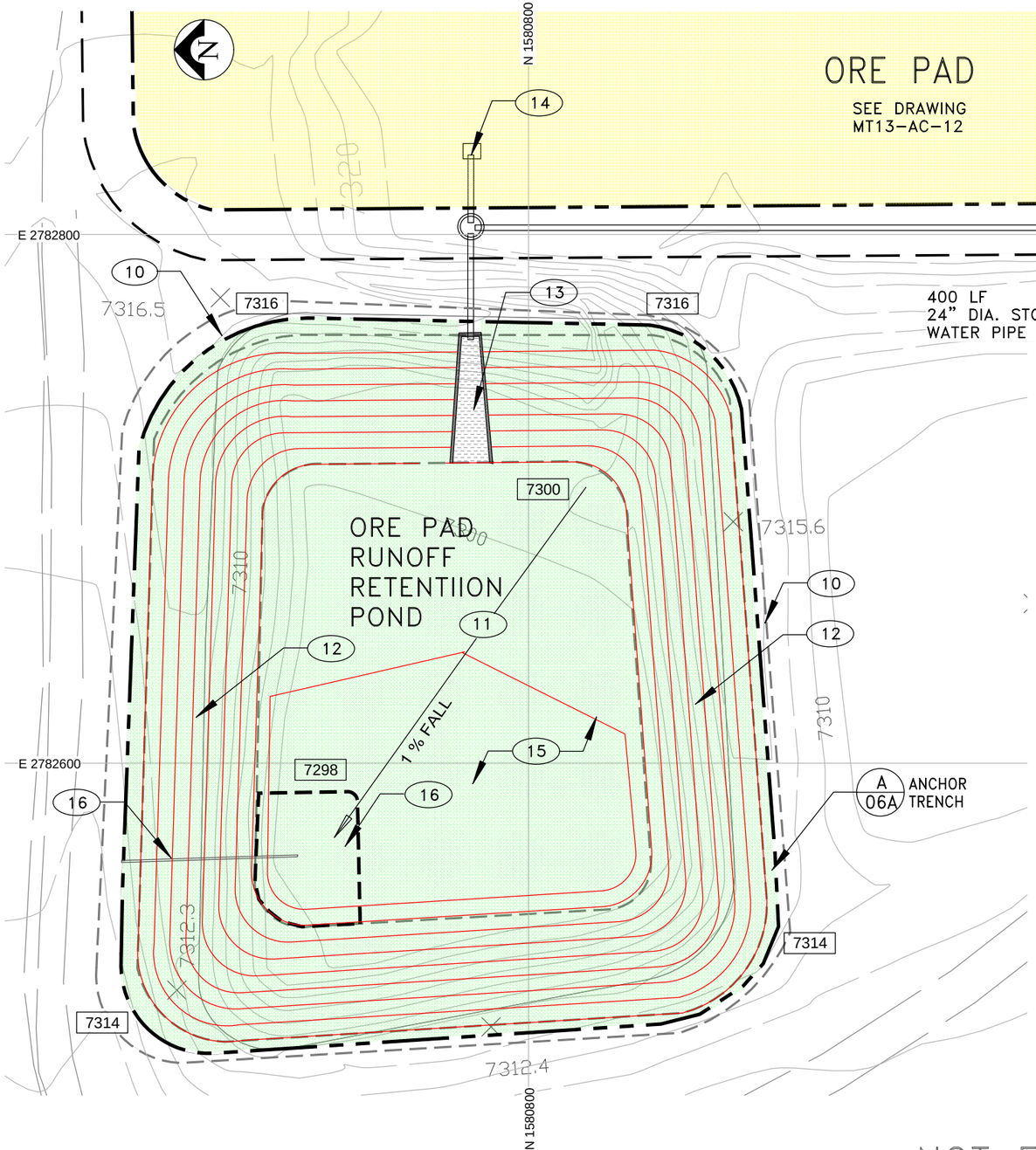
Prepared By: Alan Kuhn Associates LLC

SIZE B | SCALE: As Shown
DWG NO. MT13-AC-14

PROJECT TITLE: **MT. TAYLOR MINE MINE REACTIVATION PLAN**

SHEET TITLE: SURFACE GRADING AND DRAINAGE UPGRADES

REV 1



TRUCK WASH NOTES

1. TRUCK WASH DIMENSIONS (60' LONG X 35' WIDE)
2. MANHOLE AND OIL SEPARATOR
3. CENTER DRAIN 10' LONG X 3' WIDE
4. CONCRETE APRONS (26' LONG X 16' WIDE)
5. 16" CONCRETE WALL 1' ABOVE FINISH SLAB ELEVATION
6. UTILITIES – WATER AND ELECTRICAL
7. TRUCK WASH FLOOR
   CONCRETE SLAB SLOPING 1% TOWARDS CENTER DRAIN
8. ANCHOR TRENCH AND ORE PAD CONTAINMENT BERM
   SEE DRAWINGS MT13-AC-12 AND AC-13
9. LINER TO ATTACH DIRECTLY TO TRUCK WASH
   FOUNDATION WALLS

LEGEND

- 0000.0 — DESIGN ELEVATION
- × 0000.0 — EXISTING SPOT ELEVATION
- PERIMETER OF ORE PAD CONTAINMENT BERM
- LINER ANCHOR TRENCH
- TOP AND BOTTOM OF PONDS
- C / 06A — DOUBLE LINER AREA
- SINGLE LINER AREA
- DESIGN TOPO LINES
  TWO FOOT INTERVALS

ORE PAD RUNOFF RETENTION POND NOTES

10. POND BERM ELEVATION 7314 –MINIMUM 8 FT WIDE
    SLOPE 1% AWAY FROM ANCHOR TRENCH
11. BOTTOM OF POND – SLOPE 1% TOWARDS SUMP
12. SLOPES = 3H TO 1V
13. NEW CONCRETE HYDRAULIC STRUCTURE AND SPILLWAY
    SEE MT13-AC-07 FOR DETAILS
14. STORM MANHOLE AND CATCH BASIN
15. A / 06A and C / 06A — DOUBLE LINER SYSTEM IN POND AREA
    ANCHOR TRENCH AT TOP OF BERM
16. LEAK DETECTION AND COLLECTION SYSTEM (LDCS)
    SUMP AND PIPE – (SEE DRAWING MT13-AC-06B)

NOT FOR CONSTRUCTION

NOTE:

ORE PAD RUNOFF RETENTION POND STORAGE CAPACITY
AT HIGH WATER ELEVATION 7312 = 13.9 ACRE FEET

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC

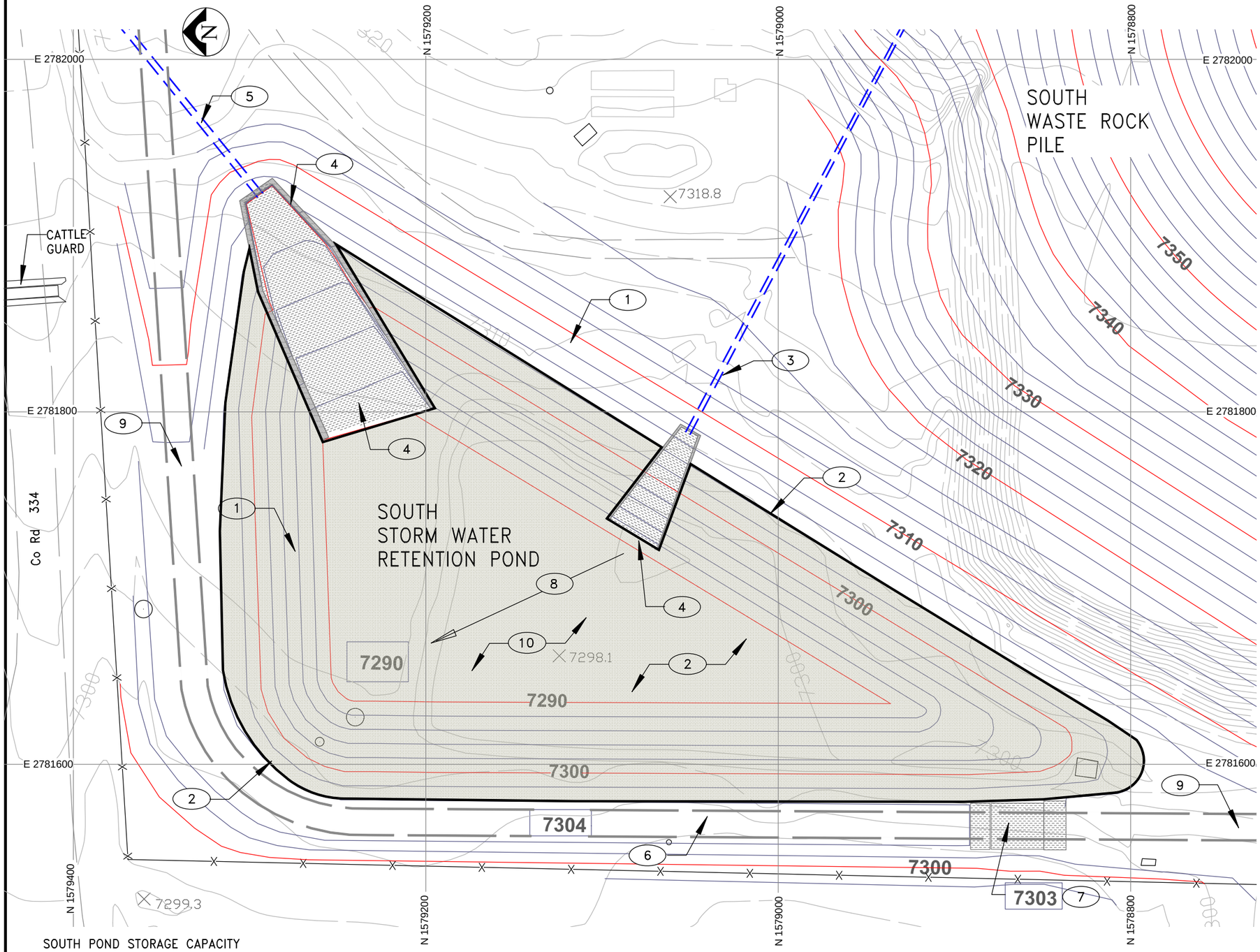
SIZE B | SCALE: As Shown

DWG NO. MT13-AC-15

PROJECT TITLE: MT. TAYLOR MINE
MINE REACTIVATION PLAN

SHEET TITLE: ORE PAD RUNOFF COLLECTION AND RETENTION

REV 0



NOTES

1. SOUTH STORM WATER RETENTION POND SLOPES (4H: 1V)
2. COMPACTED CLAY LINER – MINIMUM 1 FOOT THICK
3. NEW STORM WATER PIPE 24" DIA CMP INVERT AT SPILLWAY = 7308
4. NEW CONCRETE SPILLWAYS, HEADWALLS AND WINGWALLS (NMDOT STANDARD DRAINAGE STRUCTURES)
5. NEW STORM WATER PIPE 36" DIA CMP AT 0.7% FALL INVERT ELEVATION AT HEADWALL 7301
6. TOP OF POND BERM = 7304 POND HIGH WATER ELEVATION = 7302
7. CONCRETE SPILLWAY ELEVATION = 7303
8. BOTTOM OF POND – SLOPE 1% TOWARDS NW CORNER
9. SERVICE ROAD
10. REMOVE SEDIMENTS AND PLACE IN DISPOSAL CELL IN SOUTH WASTE ROCK PILE

LEGEND

- 7290 — DESIGN SPOT ELEVATIONS
- DESIGN CONTOURS (2 FOOT INTERVALS)
- EXISTING CONTOURS (2 FOOT INTERVALS)
- NEW STORM WATER PIPES
- CONCRETE SPILLWAYS
- CLAY LINER AREA

NOT FOR CONSTRUCTION

SOUTH POND STORAGE CAPACITY

AT MAXIMUM DESIGN POOL ELEVATION (7302)
VOLUME STORAGE = 15.5 ACRE FEET

AT SPILLWAY ELEVATION 7303
VOLUME STORAGE = 17.5 ACRE FEET

0 30 60 90 120 FT
GRAPHIC SCALE

200' GRID = NAD 83 NEW MEXICO WEST

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	AK
1	2013 Review Comments	12-17-13	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC

SIZE: B
SCALE: As Shown
DWG NO.: MT13-AC-16

PROJECT TITLE: **MT. TAYLOR MINE**
MINE REACTIVATION PLAN

SHEET TITLE: SOUTH STORM WATER RETENTION POND

REV: 1

APPENDIX B

ENGINEERING ANALYSES

MT13.01 Small Watershed Runoff South Stormwater Pond Watershed

MT13.02 Small Watershed Runoff Ore Pad

MT13.03 Ore Pad Cushion Layer Thickness

MT13.04 Capacity of the Mine Water Treatment Ponds

MT13.05 North Waste Pile Areas and Volumes

CALCULATION #	MT13.01	PROJECT # MT13-AC	Page 1 of 2	REV	DATE
PROJECT:	MT TAYLOR MINE REACTIVATION			0	2/15/2013
CALCULATION NAME:	**Small Watershed Runoff**				
	South Stormwater Pond Watershed				
Originator	Alan Kuhn	Checker	Ed Loescher		

Objective: Calculate the estimated runoff parameters needed to design the capacity of culverts and the south storm water retention pond for events up to the 100 year storm.

Given: NPDES #NMR05GB27 requirements apply. Pond capacity must be sufficient to to contain design storm runoff. Existing diversions remain.

Assumptions:

1) Discharge of runoff crossing county road south to north will be redirected to south pond. Area north of county road will be drain naturally to Marquez Arroyo.
2) New culvert will be added around east and north side of old waste pile.
3) For conservatism, pond will be sized to contain all runoff from the 100 year storm, plus up to one additional 100 year storm.

References: NMSHTD Drainage Manual, 1995
NOAA Atlas 14, Vol 1, Version 5, San Mateo
Mt Taylor Mine topographic map 2012, by TJ Mann & Associates
South Stormwater Pond Watershed Parameters RGR-MT13.AC-CALC-04

CALCULATION

Simplified Peak Flow Method (NMSHTD Drainage Manual, 1995)

Time of Concentration, Tc

(NMSHTD Drainage Manual,1995, Vol. 1, eqn 3-18)
(South Stormwater Pond Watershed Parameters figure)

Tc= 0.0078*L^0.77*S^(-0.385)

Flow Path Segment #		length	slope	elev
	1	94	0.02	7500
	2	119	0.1591	
	3	162	0.1904	
	4	113	0.1005	
	5	65	0.0603	
	6	162	0.0768	
	7	113	0.1557	
	8	67	0.41	
	9	393	0.0032	
	10	251	0.123	
	11	439	0.0262	
	12	339	0.0308	
	13	389	0.012	
	14	551	0.005	
	15	131	0.005	
	16	394	0.005	7304.26
L, ft =	Sum	3782		
S=	Ave			0.05176

Tc= 13.87 minutes

CALCULATION #	MT13.02	PROJECT # MT13-AC	Page 1 of 2	REV	DATE
PROJECT:	MT TAYLOR MINE REACTIVATION			0	2/15/2013
CALCULATION NAME:	Small Watershed Runoff	Ore Pad			
Originator	Alan Kuhn	Checker	Ed Loescher		

Objective: Calculate the estimated runoff parameters needed to design the capacity of culverts and the ore pad runoff retention pond for events up to the 100 year storm, plus antecedent runoff including truck wash.

Given: NPDES #NMR05GB27 requirements apply. Pond capacity must be sufficient to to contain design storm runoff. Zero discharge from pond required.

Assumptions:

1) All discharge of runoff from the ore pad north will be redirected to ore pad runoff retention pond, formerly the north retention pond.
2) Other runoff north of the county road will drain to Marquez Arroyo.
3) For conservatism, pond will be sized to contain all runoff from the 100 year storm, plus up to one additional 100 year storm.
4) Equal areas with equal slopes drain to each of two catch, then flows combine into pond.
5) No separate or added capacity beyond two 100 year storms needed for truck wash runoff.

References: NMSHTD Drainage Manual, 1995
NOAA Atlas 14, Vol 1, Version 5, San Mateo
Mt Taylor Mine topographic map 2012, by TJ Mann & Associates

CALCULATION

Simplified Peak Flow Method (NMSHTD Drainage Manual, 1995)

Time of Concentration, Tc (NMSHTD Drainage Manual,1995, Vol. 1, eqn 3-18)

Tc= 0.0078*L^0.77*S^(-0.385)

Flow Path		length	slope	elev
Segment #	1	440	0.01	7318.4
				7314
L, ft =	Sum	440		
S=	Ave			0.01

Tc= 4.98 minutes

Precipitation (NOAA Atlas 14, Vol 1, Version 5, San Mateo)

In Inches for:

	Recurrence Interval, years		
Duration	10	50	100
6 hr	1.36	1.84	2.06
24 hr	1.71	2.26	2.51

Area, A 10 acres

scaled from Mt Taylor Mine topographic map 2012

CALCULATION #	MT13.02	PROJECT # MT13-AC	Page 2 of 2	REV	DATE
PROJECT:	MT TAYLOR MINE REACTIVATION			0	2/15/2013
CALCULATION NAME:	Small Watershed Runoff		Ore Pad		

Runoff Curve Number, CN

(NMSHTD Drainage Manual,1995, Vol. 1, 3.3.1.3.1; Fig. 3-8, Table 3-1 and 3-4)

Soil Group		C
Vegetation type		none
Per cent cover		<30%
CN =	85 to 91, =	91

Unit Peak Discharge, qu (NMSHTD Drainage Manual,1995, Vol. 1, eqn 3-22)

qu = 0.543 Tc^-0.812= 0.147 cfs/ac-in

Direct runoff, Qd (NMSHTD Drainage Manual,1995, Vol. 1, eqn 3-23)

Qd= (P-(200/CN)+2)^2/(P+(800/CN)-8)

10 yr	Qd=	0.91 inches
50 yr	Qd=	1.39 inches
100 yr	Qd=	1.62 inches

Peak Discharge, Qp

Qp= A*qu*Qd to each catch basin

10 yr	Qp=	1.35 cfs
50 yr	Qp=	2.05 cfs
100 yr	Qp=	2.39 cfs

Runoff Volume, Qv

Qv= Qd*A/12 to each catch basin total

10 yr	Qv=	0.76 ac ft	1.52 ac ft
50 yr	Qv=	1.16 ac ft	2.32 ac ft
100 yr	Qv=	1.35 ac ft	2.70 ac ft

CALCULATION #	MT13.03		PROJECT # MT13-AC	Page: **2 of 2**	REV	DATE
PROJECT:	MT TAYLOR MINE REACTIVATION				0	2/19/2013
CALCULATION NAME:			Ore Pad Cushion Layer Thickness			

CALCULATION

Calculate the maximum load on the liner versus allowable load based on puncture resistance, using several cushion layer depths to find necessary depth

Load imposed by 988 loader

L, Load per tire =	28757	lbs.	Ref.1
A, Tire gross contact area =	652	in.^2	Ref.2
R, radius of contact area, inches =	14.4	in.	
P, Pressure applied on ground = L*A =	44.11	psi	
Tire width =	35.5	in.	Ref.2
Puncture Resistance of 60 mil HDPE, min. ave,	108	lbs	Ref.3

based on ASTM D6241 using 2.0 in. diameter probe, or 34.4 psi

Load at liner level

Ref. 4

1) For distributed load Bousinnesq eqn for load vertically below center of tire, S_z

S_z = P*(1-(1/(1+(1/(z/R)^2)))^1.5) Ref.4, eqn 40.3

z= depth below surface to liner, inches

z	S_z, psi
6	41.60
12	32.53
18	23.11
24	16.30
30	11.79

or:

2) Alternative Method per Ref. 5 with Froehlich concentration factor

S_z =P[1-(z/(R^2+z^2)^0.5)^v]

S_z =vertical stress at depth z, psi

P= vertical stress (pressure) at ground surface, psi = 44.11

z = vertical distance between point load and depth of interest, inches

R = radius of applied (assumed) circular loaded area, inches = 14.4

for equivalent circular area of contact for 988 loader

v = Froehlich concentration factor, for normal soil = 4

S_z =44.11*[1-(z/(14.4^2+z^2)^0.5)^4]

z, inches	$S_{z,\ psi}$
6	43.14
12	36.70
18	27.71
24	20.26
30	14.97

Results: Method 2 gives the more conservative results.

Load from equipment on liner <= 34.4 psi at 18 inches, so 2.5 ft (30 in.) of cushion layer+ 12 inches travel course allows for some additional load from soil weight and other unknowns.

CALCULATION #	MT13.03		PROJECT # MT13-AC	Page: **1 of 2**	REV	DATE
PROJECT:	**MT TAYLOR MINE REACTIVATION**				0	2/19/2013
CALCULATION NAME:		**Ore Pad Cushion Layer Thickness**				
Originator	Alan Kuhn		Checker	Ed Loescher		

Objective: Calculate the thickness of soil cushion layer required to protect the underlying HDPE membrane from puncture from equipment working on the pad surface.

Given: Location of the ore pad remains as previous. Cushioning material will be locally available SC, CL, SP, and SP-SM soils. A 1.0 ft travel/ drainage layer of gravel or crushed sandstone will overlie the cushion layer.

Assumptions:

1) Maximum load is from a CAT 988 loader
2) Cushion layer placed and compacted without specified density, so 85 pcf dry density assumed
3) 988 tires are 35/65-33 per CAT manual
4) Cushion soil mass is elastic, isotropic, homogeneous and semi-infinite.
5) Puncture is primary liner failure mode
6) Boussinesq pressure distribution through soil from tire load

References:

1) CAT Manual 2012
2) http://www.goodyearotr.com/cfmx/web/otr/tire-selector/detailresults.cfm?tireid=1557
3) GRI Test Method GM13* Standard Specification for "Test Methods, Test Properties and Testing Frequency forHigh Density Polyethylene (HDPE) Smooth and Textured Geomembranes"
4) Soil Mechanics in Engineering Practice, 3rd Ed. , 1996, K. Terzaghi, R.B.Pech, and G. Mesri
5) Estimating Vertical Stress on Soil subjected to Vehicular Loading, ERDC/CRREL TR-09-2 US Army Corps of Engineers, February 2009

CALCULATION #	MT13.04	PROJECT #	MT13-AC	REV	DATE
PROJECT:	MT TAYLOR MINE REACTIVATION			0	2/27/2013
CALCULATION NAME:	**Capacity of the Mine Water Treatment Ponds**				

Originator	Ed Loescher	Checker	Alan Kuhn

Objective: Calculate the volume capacity of the mine water treatment ponds. Compare these values with those shown in the 1981 mine water discharge drawings

Given: Data from the two referenced mine water flow drawings regarding the water operating levels and areas. The survey data for the levels of the weirs on the hydraulic structures that control the flow in the ponds. New topographic base map from 2012. Some differences are expected due to accumulation of sediments, change to NAD 83 coordinates, and more modern survey and imaging methods.

Assumptions:

1) The minimum water pool elevation (assumes 0 flow through) for the ponds is determined by the elevation of the outlet weirs.
2) The maximum pool elevation determined by assuming a 2' freeboard from the top of the pond berms.
3) Volumes for the *existing* (as-is) conditions (Table 1) before upgrades (slope regrade or deepening).
4) Volumes after design upgrades (Table 2) are achieved primarily by balanced cut and fill of the pond slopes.

References:

1) AutoCAD Civil 3d Volume Calculation tools
2) Autocad Drawing of Mt Taylor Mine topographic map 2012, by TJ Mann & Associates
3) Drawing # 0000-P-983 Titled -"Water Treatement System Flow Schematic Minewater Discharge (Figure lV)- Rev 5 - Dated 9/22/1981
4) Drawing # 0000-P-797 Titled -"Water Treatement System Flow Scheme - Rev 4 - Dated 3/06/1981

CALCULATION

Methods: Use Autocad Civil 3d (2013) volume analysis tools to calculate existing volumes, based on existing topography as provided by recent survey by Thomas Mann and Associates, 2012.

Table 1 ***Ponds in Existing Condition***

	Ref. 3		Ref 4
Pond Number	**Pond Water Level Elevation**	**Pond Area Sq Ft.**	**Volume Capacity (Acre Feet)**
1	7303.4	44600	8.36
2	7297.7	31550	5.88
3	7294.2	43100	8.45
4	7286.4	68750	13.77
5	7283.0	66000	13.22
6	7282.8	11100	1.72
7	7282.8	10700	1.72
8	7287.4	45250	9.1
TOTALS	AREA	321050	
	VOLUME		62.22

Table 2 Ponds With Design Upgrades

Based on 2012 Topography and AutoCAD (Ref. 2 and 1)

Pond Number	Operating Pool Elevation	OPL	Area , ft^2	Volume, cy	Volume (acre feet)
1	Min	7305	68938	32911.6	15.32
	Max	7308		24718	20.40
2	Min	7299.6	31655	5803	3.60
	Max	7301		7470	4.63
3	Min	7296.7	40373	12420	7.70
	Max	7300		18130	11.24
4	Min	7287.5	60195	12680.4	7.86
	Max	7291		14977.3	9.28
5	Min	7285	60218	11728.7	7.27
	Max	7286		14041	8.70
6	Min	7282.8	6636	698	0.43
	Max	7286		1622.8	1.01
7	Min	7282.8	6634	697.8	0.43
	Max	7286		1614.8	1.00
8	Min	7287.5	34105	4489.2	2.78
	Max	7291		9568.5	5.93
			308754		
		VOLUMES AT MIN			50.47
		VOLUMES AT MAX			57.11

CALCULATION #	MT13.05		PROJECT #	MT13-AC	REV	DATE
PROJECT:	MT TAYLOR MINE REACTIVATION				0	3/24/2013
CALCULATION NAME:	North Waste Pile Areas and Volumes					
Originator	Ed Loescher	Checker	Alan Kuhn			

Objective:

Calculate various earthwork quantities for the CCP for the future North Waste Rock Pile.

Given: The basic design of the north waste rock pile with connected runoff retention basin as shown in Drawing MT13-AC-10. Base topography from 2012 Thomas Mann survey.

Assumptions:

1) Quantities shown are for final build out
2) Retention basin and surrounding diversion channel earthwork are separate from the main pile and will be performed first.

References:

1) Drawing MT13-AC-10
2) AutoCAD Volume Calculation method

CALCULATION

AutoCAD Civil 3D 2012 used to find areas and volumes, applying base topography compared to the final topography at full buildout.

North Waste Rock Retention Runoff Basin

Basic design parameters			
Top of basin berm	7284	feet	Reference #1
Bottom of basin excavation	7272	feet	
Basin side slopes	4H: 1V		
High water elevation	7282	feet	
Surface area for clay liner	80097	Sq ft	
Volume of clay liner, 1 ft thick	2967	CY	
Capacity at high water level	22.1	Acre Feet	

Earthwork quantities

Cut for basin	18291	CY	Reference #2
Fill for basin embankment	4792	CY	
Net clean soil to be stockpiled for cover	13499	CY	

North Waste Rock Pile (at full buildout)

Dimensions (maximum)			
Top of pile	7352	feet	Reference #1
Bottom of pile	existing grades		
Pile side slopes	5H: 1V		

Calculated Areas and Volumes Reference #2

Total area of waste rock pile cover	805372	Sq Ft		
Total volume of waste rock pile cover	59,657	CY		
Total area of the top of the pile	274071	Sq Ft		
Total slope areas	531301	Sq Ft	12.20	Acres
Total disturbed area	1184398	Sq Ft	27.19	Acres

Earthwork quantities

Fill capacity for waste rock storage at full buildout	675525	CY
Cut for diversion channel around pile	8278	CY
Clean fill for containment berm around pile	13474	CY

SEGMENT NUMBER	STARTING ELEVATION	SEGMENT LENGTH FEET	SLOPE PERCENT	SURFACE DESCRIPTION
1	7500	94.14	2.00%	Rocky Mountain side
2	7498	119.13	-15.91%	steep cliff
3	7479	161.5	-19.04%	steep cliff
4	7448	112.6	-10.05%	Arroyo
5	7437	64.5	-6.03%	Arroyo
6	7433	162.4	-7.68%	gravel road way
7	7421	113.1	-15.57%	gravel road way
8	7403	67	-41.00%	steep cliff
9	7376	393.3	-0.32%	gravel road way
10	7374	251	-12.30%	gravel road way
11	7344	438.6	-2.62%	gravel road way
12	7332	339	-3.08%	drainage ditch

WATER ENTERS STORM SYSTEM

13	7314.3	66.4	-1.20%	MH 5 - 48' CMP
14	7313.49	322.3	-1.20%	MH 4 - 48' CMP
15	7309.64	550.7	0.50%	MH 3 - 48' CMP
16	7306.88	130.7	0.50%	MH 2 - 48' CMP
17	7306.23	394.4	0.50%	MH 1 - 48' CMP

TOTAL AREA = 77.5 ACRES

CALCULATION PURPOSE: PROVIDE BACKGROUND DATA FOR SOUTH STORM WATER RETENTION POND DESIGN. DATA REQUIRED IS CONTRIBUTING AREAS IN ACRES AND LENGTHS WITH SLOPES FOR THE VARIOUS SEGMENTS OF THE FLOW PATH.

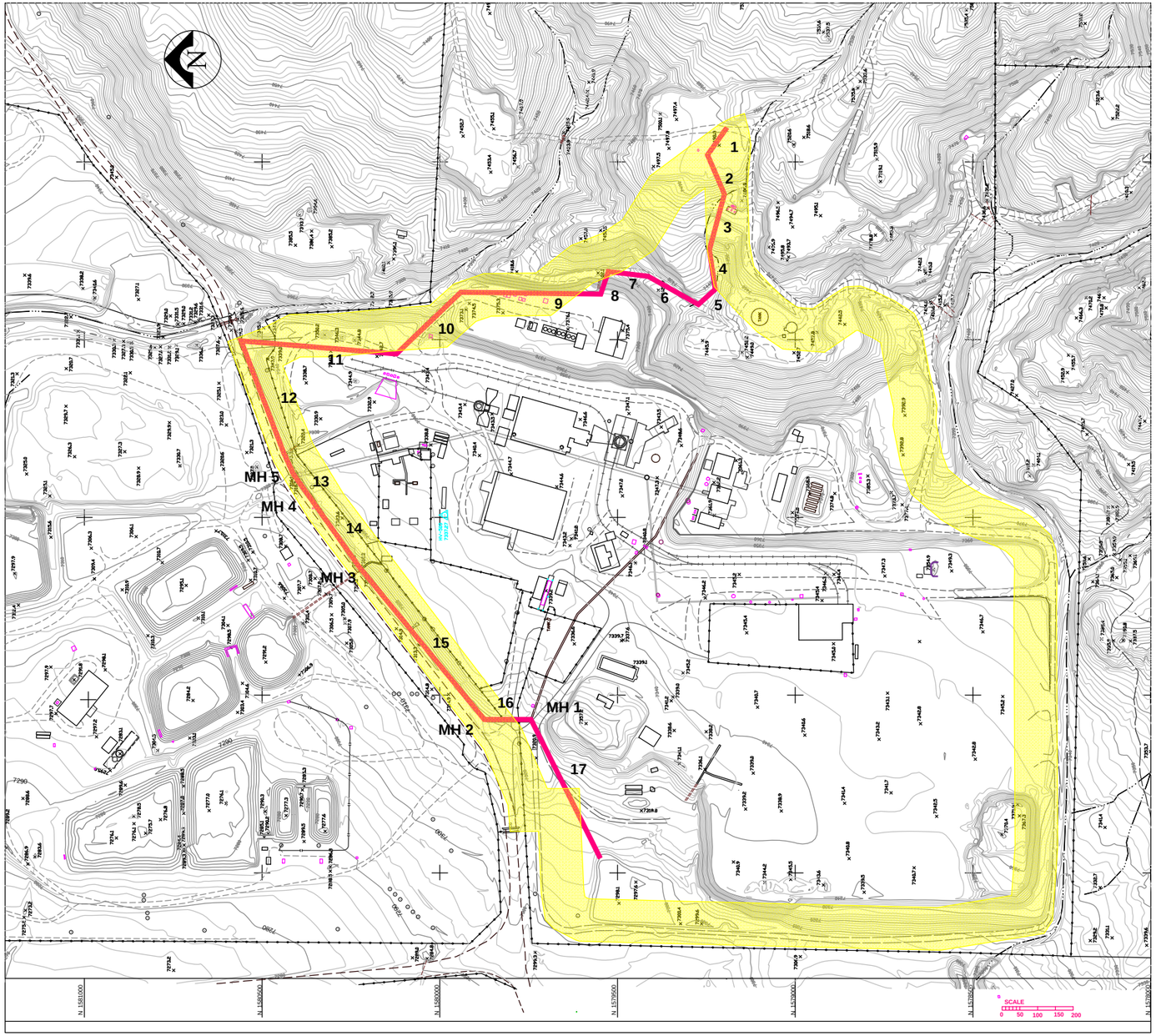
CALCULATION PROCEDURE: FROM AUTOCAD CIVIL 3D DETERMINE THE FLOW LINE FROM THE MOST UPSTREAM POINT TO THE POINT OF DISCHARGE AT THE POND. CREATE A FEATURE LINE FOLLOWING THE FLOW PATH. FIND THE LENGTHS AND SLOPES OF EACH SEGMENT BY LISTING THE SEGMENT LINE PROPERTIES IN AUTOCAD.

CALCULATION DOCUMENTS: 3D TOPOGRAPHY FROM AERIAL SURVEY DRAWING. THOMAS MANN, SURVEYOR 2012.

LEGEND

FLOW LINE

CONTRIBUTING AREA = 77.5 ACRES



REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
A	2013 CONTRIBUTING AREA	2/4/13	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC

SIZE B | SCALE: AS NOTED

CALC NO. RGR-MT- AC-CALC 01

PROJECT TITLE: MT. TAYLOR MINE
MINE REACTIVATION PLAN

SHEET TITLE: SOUTH STORM WATER POND CALCULATION FIGURE 1

REV A

APPENDIX C

OTHER PERMITS

NPDES #NM0028100

NPDES # NMR05GB27

SOURCE MATERIAL LICENSE SO043

SPECIAL USE PERMIT MOT 220

SOLID WASTE LANDFILL REGISTRATION

Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

NPDES Permit No. NM0028100

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"),

Rio Grande Resources Corporation

P.O. Box 1150

Grants, NM 87020

is authorized to discharge from Mt. Taylor Mine located in San Mateo, Cibola County, New Mexico, through an outfall located in McKinley County

to receiving water named unnamed arroyo to San Miguel Creek, thence to Arroyo Chico, thence to Rio Puerco, and thence to Rio Grande in Waterbody Segment No. 20.6.4.105 of Rio Grande Basin, from

Outfall 001: Latitude: 35° 24' 00", Longitude: 107° 38' 24"

in accordance with this cover page and effluent limitations, monitoring requirements, and other conditions set forth in Parts I [Requirements for NPDES Permits], II [Other Conditions], and III [Standard Conditions for NPDES Permits] hereof.

This permit supersedes and replaces NPDES Permit No. NM0028100 issued on March 30, 2005.

This permit shall become effective on August 1, 2010

This permit and the authorization to discharge shall expire at midnight, July 31, 2015

Issued on July 28, 2010

Miguel I. Flores
Division Director
Water Quality Protection Division (6WQ)

Prepared by

Isaac Chen
Environmental Engineer
Permits Section (6WQ-PP)

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PART I – REQUIREMENTS FOR NPDES PERMITS

SECTION A. LIMITATIONS AND MONITORING REQUIREMENTS

1. Outfalls 001

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge from Outfall 001. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS		DISCHARGE LIMITATIONS Standard Units		MONITORING REQUIREMENTS	
POLLUTANT	STORET CODE	MINIMUM	MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH	00400	6.6	9.0	1/Day	Grab

EFFLUENT CHARACTERISTICS		DISCHARGE LIMITATIONS lbs/day, unless noted		DISCHARGE LIMITATIONS mg/l, unless noted		MONITORING REQUIREMENTS	
POLLUTANT	STORET CODE	30-Day Avg	Daily Max	30-Day Avg	Daily Max	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	50050	Report MGD	Report MGD	***	***	Continuous	Totalizing Meter
Total Suspended Solids	00530	N/A	N/A	20	30	1/Day	Grab
Chemical Oxygen Demand	00340	N/A	N/A	100	125	1/Day	Grab
Ra226 (dissolved)	09503	N/A	N/A	3 pCi/l	10 pCi/l	1/Day	Grab
Total Ra226	09501	N/A	N/A	10 pCi/l	30 pCi/l	1/Day	Grab
Total Ra226+Ra228	11503	N/A	N/A	20 pCi/l	30 pCi/l	1/Day	Grab
Total Uranium	22706	N/A	N/A	2.0	4.0	1/Day	Grab
Total Zinc	01092	N/A	N/A	0.5	1.0	1/Day	Grab
Total Aluminum	01105	N/A	N/A	3.3	5.0	1/Day	Grab
Total Boron	01022	N/A	N/A	0.5	0.75	1/Day	Grab
Total Cadmium	01027	N/A	N/A	0.06	0.1	1/Day	Grab
Total Chromium	01034	N/A	N/A	0.32	0.48	1/Day	Grab
Total Cobalt	01037	N/A	N/A	0.033	0.05	1/Day	Grab
Total Copper	01042	N/A	N/A	0.35	0.53	1/Day	Grab

Total Mercury	71900	N/A	N/A	0.51 µg/l	0.77 µg/l	1/Day	Grab
Total Molybdenum	01062	N/A	N/A	0.67	1.0	1/Day	Grab
Total Selenium	01147	N/A	N/A	3.3 µg/l	5.0 µg/l	1/Day	Grab
Total Vanadium	01087	N/A	N/A	0.067	0.1	1/Day	Grab
Total Alpha	80029	N/A	N/A	10 pCi/l	15 pCi/l	1/Day	Grab
E. coli	51040	N/A	N/A	126 cfu/100 ml	410 cfu/100 ml	1/Day	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
WHOLE EFFLUENT TOXICITY TESTING (*1) (48-Hour Static Renewal)	30-DAY AVG MINIMUM	48-HR MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Daphnia pulex	Report	Report	1/3 Months (*1)	24-Hr Composite

Footnotes:

*1 Monitoring frequency 1/3-month for the 1st year of the permit. If all tests pass, reduce the frequency to 1/6-month for years 2 – 5, and resume the frequency of 1/3-month on the last day of the permit. If any test fails during the period of the permit, return the frequency to 1/3-month for the remainder of the permit.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfalls 001.

2. Inter Outfalls 01A

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge treated sanitary wastewater from Inter Outfall 01A. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS		DISCHARGE LIMITATIONS Standard Units		MONITORING REQUIREMENTS	
POLLUTANT	STORET CODE	MINIMUM	MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH	00400	6.0	9.0	1/Day	Grab

EFFLUENT CHARACTERISTICS		DISCHARGE LIMITATIONS lbs/day, unless noted		DISCHARGE LIMITATIONS mg/l, unless noted		MONITORING REQUIREMENTS	
POLLUTANT	STORET CODE	30-Day Avg	Daily Max	30-Day Avg	Daily Max	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	50050	Report MGD	Report MGD	N/A	N/A	Continuous	Totalizing Meter
Total Suspended Solids	00530	N/A	N/A	30	45	1/Day	Grab
BOD	00310	N/A	N/A	30	45	1/day	Grab

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): after the last treatment unit prior to co-mingling with other waste sources.

FLOATING SOLIDS OR VISIBLE FOAM

There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

NO DISCHARGE REPORTING

If there is no discharge event at this outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the preprinted Discharge Monitoring Report.

B. REPORTING OF MONITORING RESULTS

Monitoring information shall be on Discharge Monitoring Report Form(s) EPA 3320-1 or electronic NetDMR as specified in Part III.D.4 of this permit and shall be submitted monthly. The permittee is required to submit regular monthly reports as described above no later than the 15th day of the month following each reporting period.

C. EFFLUENT CHARACTERISTICS

The permittee is required to take representative samples of mine drainage for analyses of constitutes listed in Application Form 2-C, section V. Part A-D. The analytical results shall be sent to the following address no later than 90 days prior to any discharge to the water of the United States.

Water Quality Protection Division
NPDES Permits & TMDL Branch
U.S. Environmental Protection Agency, Region 6
Dallas, TX 75202-2733

PART II
OTHER CONDITIONS

A. 24-hour Composite Sample

The term "24-hour composite sample" means a sample consisting of a minimum of eight (8) grab samples of effluents collected at regular intervals over a normal operating day and combined proportional to flow, or a sample continuously collected proportional to flow over a normal operating day.

B. Test Procedures

a. The effluent characteristics "dissolved radium 226" and "total radium 226" shall be measured by one of the approved methods in accordance with the procedures discussed for dissolved radium 226 and total radium 226 in Standard Methods for the Examination of Water and Wastewater, latest edition, or an equivalent method.

b. The effluent characteristic "Total Uranium" shall be measured by the procedure discussed in the HASL Procedural Manual, edition by John H. Harley, HASL 300 Health and Safety Laboratory, U.S. Atomic Energy Commission, 1973, pg. EU-03, or an equivalent method.

C. Radioactivity

Sections 20.6.4.13 General Standards, Paragraph G Radioactivity of State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC): The radioactivity of surface waters of the state shall be maintained at the lowest practical level and shall in no case exceed the standards set forth in New Mexico Radiation Protection Regulations, 20.3.1 and 20.3.4 NMAC.

D. Minimum Qualification Levels (MQLS)

If any individual analytical test result is less than the MQL for that parameter listed in Appendix A to this Part, then a value of zero may be used for discharge monitoring report (DMR) calculations and reporting requirements for the parameter.

The permittee may develop an effluent specific method detection limit (MDL) in accordance with Appendix B to 40CFR136. For any pollutant for which the permittee determines an effluent specific MDL, the permittee shall send to the EPA Region 6 NPDES Permits Branch (6WQ-P) a report containing QA/QC documentation, analytical results, and calculations necessary to demonstrate that the effluent specific MDL was correctly calculated. An effluent specific minimum quantification level (MQL) shall be determined in accordance with the following calculation:

MQL = 3.3 x MDL

Upon written approval by the EPA Region 6 NPDES Permits Branch (6WQ-P), the effluent specific MQL may be utilized by the permittee for all future Discharge Monitoring Report (DMR) reporting requirements.

E. Reopener Clause

In accordance with 40 CFR Part 122.44(d), the permit may be reopened and modified during the life of the permit if relevant portions of New Mexico's Water Quality Standards for Interstate and Intrastate Streams are revised, or new State water quality standards are established and/or remanded by the New Mexico Water Quality Control Commission.

In accordance with 40 CFR Part 122.62(s)(2), the permit may be reopened and modified if new information is received that was not available at the time of permit issuance that would have justified the application of different permit conditions at the time of permit issuance.

APPENDIX A of PART II

The following Minimum Quantification Levels (MQL's) are to be used for reporting pollutant data for NPDES permit applications and/or compliance reporting.

POLLUTANTS	MQL µg/l	POLLUTANTS	MQL µg/l
METALS, RADIOACTIVITY, CYANIDE and CHLORINE			
Aluminum	2.5	Molybdenum	10
Antimony	60	Nickel	0.5
Arsenic	0.5	Selenium	5
Barium	100	Silver	0.5
Beryllium	0.5	Thalllium	0.5
Boron	100	Uranium	0.1
Cadmium	1	Vanadium	50
Chromium	10	Zinc	20
Cobalt	50	Cyanide	10
Copper	0.5	Cyanide, weak acid dissociable	10
Lead	0.5	Total Residual Chlorine	33
Mercury *1	0.0005		
	0.005		
DIOXIN			
2,3,7,8-TCDD	0.00001		
VOLATILE COMPOUNDS			
Acrolein	50	1,3-Dichloropropylene	10
Acrylonitrile	20	Ethylbenzene	10
Benzene	10	Methyl Bromide	50
Bromoform	10	Methylene Chloride	20
Carbon Tetrachloride	2	1,1,2,2-Tetrachloroethane	10
Chlorobenzene	10	Tetrachloroethylene	10
Clorodibromomethane	10	Toluene	10
Chloroform	50	1,2-trans-Dichloroethylene	10
Dichlorobromomethane	10	1,1,2-Trichloroethane	10
1,2-Dichloroethane	10	Trichloroethylene	10
1,1-Dichloroethylene	10	Vinyl Chloride	10
1,2-Dichloropropane	10		
ACID COMPOUNDS			
2-Chlorophenol	10	2,4-Dinitrophenol	50
2,4-Dichlorophenol	10	Pentachlorophenol	5
2,4-Dimethylphenol	10	Phenol	10
4,6-Dinitro-o-Cresol	50	2,4,6-Trichlorophenol	10

POLLUTANTS	MQL µg/l	POLLUTANTS	MQL µg/l
	BASE/NEUTRAL		
Acenaphthene	10	Dimethyl Phthalate	10
Anthracene	10	Di-n-Butyl Phthalate	10
Benzidine	50	2,4-Dinitrotoluene	10
Benzo(a)anthracene	5	1,2-Diphenylhydrazine	20
Benzo(a)pyrene	5	Fluoranthene	10
3,4-Benzofluoranthene	10	Fluorene	10
Benzo(k)fluoranthene	5	Hexachlorobenzene	5
Bis(2-chloroethyl)Ether	10	Hexachlorobutadiene	10
Bis(2-chloroisopropyl)Ether	10	Hexachlorocyclopentadiene	10
Bis(2-ethylhexyl)Phthalate	10	Hexachloroethane	20
Butyl Benzyl Phthalate	10	Indeno(1,2,3-cd)Pyrene	5
2-Chloronapthalene	10	Isophorone	10
Chrysene	5	Nitrobenzene	10
Dibenzo(a,h)anthracene	5	n-Nitrosodimethylamine	50
1,2-Dichlorobenzene	10	n-Nitrosodi-n-Propylamine	20
1,3-Dichlorobenzene	10	n-Nitrosodiphenylamine	20
1,4-Dichlorobenzene	10	Pyrene	10
3,3'-Dichlorobenzidine	5	1,2,4-Trichlorobenzene	10
Diethyl Phthalate	10		
	PESTICIDES AND PCBS		
Aldrin	0.01	Beta-Endosulfan	0.02
Alpha-BHC	0.05	Endosulfan sulfate	0.02
Beta-BHC	0.05	Endrin	0.02
Gamma-BHC	0.05	Endrin Aldehyde	0.1
Chlordane	0.2	Heptachlor	0.01
4,4'-DDT and derivatives	0.02	Heptachlor Epoxide	0.01
Dieldrin	0.02	PCBs	0.2
Alpha-Endosulfan	0.01	Toxaphene	0.3

(MQL's Revised November 1, 2007)

Footnotes:

*1 Default MQL for Mercury is 0.005 unless Part I of your permit requires the more sensitive Method 1631 (Oxidation / Purge and Trap / Cold vapor Atomic Fluorescence Spectrometry), then the MQL shall be 0.0005.

PART III - STANDARD CONDITIONS FOR NPDES PERMITS

A. GENERAL CONDITIONS

1. INTRODUCTION
In accordance with the provisions of 40 CFR Part 122.41, et. seq., this permit incorporates by reference ALL conditions and requirements applicable to NPDES Permits set forth in the Clean Water Act, as amended, (hereinafter known as the "Act") as well as ALL applicable regulations.

2. DUTY TO COMPLY
The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

3. TOXIC POLLUTANTS

a. Notwithstanding Part III.A.5, if any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition.

b. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Act for toxic pollutants within the time provided in the regulations that established those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

4. DUTY TO REAPPLY
If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit. The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date. Continuation of expiring permits shall be governed by regulations promulgated at 40 CFR Part 122.6 and any subsequent amendments.

5. PERMIT FLEXIBILITY
This permit may be modified, revoked and reissued, or terminated for cause in accordance with 40 CFR 122.62-64. The filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. PROPERTY RIGHTS
This permit does not convey any property rights of any sort, or any exclusive privilege.

7. DUTY TO PROVIDE INFORMATION
The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

8. CRIMINAL AND CIVIL LIABILITY
Except as provided in permit conditions on "Bypassing" and "Upsets", nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of the permit, the Act, or applicable regulations, which avoids or effectively defeats the regulatory purpose of the Permit may subject the Permittee to criminal enforcement pursuant to 18 U.S.C. Section 1001.

9. OIL AND HAZARDOUS SUBSTANCE LIABILITY
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

10. STATE LAWS
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

11. SEVERABILITY
The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

B. PROPER OPERATION AND MAINTENANCE

1. NEED TO HALT OR REDUCE NOT A DEFENSE
It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. The permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failure either by means of alternate power sources, standby generators or retention of inadequately treated effluent.

2. DUTY TO MITIGATE
The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

3. PROPER OPERATION AND MAINTENANCE

a. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by permittee as efficiently as possible and in a manner which will minimize upsets and discharges of excessive pollutants and will achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

b. The permittee shall provide an adequate operating staff which is duly qualified to carry out operation, maintenance and testing functions required to insure compliance with the conditions of this permit.

4. BYPASS OF TREATMENT FACILITIES

a. BYPASS NOT EXCEEDING LIMITATIONS
The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts III.B.4.b. and 4.c.

b. NOTICE

(1)ANTICIPATED BYPASS
If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

(2)UNANTICIPATED BYPASS
The permittee shall, within 24 hours, submit notice of an unanticipated bypass as required in Part III.D.7.

c. PROHIBITION OF BYPASS

(1) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,

(c) The permittee submitted notices as required by Part III.B.4.b.

(2) The Director may allow an anticipated bypass after considering its adverse effects, if the Director determines that it will meet the three conditions listed at Part III.B.4.c(1).

5. UPSET CONDITIONS

   a. EFFECT OF AN UPSET
   An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Part III.B.5.b. are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

   b. CONDITIONS NECESSARY FOR A DEMONSTRATION OF UPSET
   A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   (1) An upset occurred and that the permittee can identify the cause(s) of the upset;

   (2) The permitted facility was at the time being properly operated;

   (3) The permittee submitted notice of the upset as required by Part III.D.7; and,

   (4) The permittee complied with any remedial measures required by Part III.B.2.

   c. BURDEN OF PROOF
   In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

6. REMOVED SUBSTANCES
   Unless otherwise authorized, solids, sewage sludges, filter backwash, or other pollutants removed in the course of treatment or wastewater control shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

7. PERCENT REMOVAL (PUBLICLY OWNED TREATMENT WORKS)
   For publicly owned treatment works, the 30-day average (or Monthly Average) percent removal for Biochemical Oxygen Demand and Total Suspended Solids shall not be less than 85 percent unless otherwise authorized by the permitting authority in accordance with 40 CFR 133.103.

C. MONITORING AND RECORDS

1. INSPECTION AND ENTRY
   The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by the law to:

   a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

   b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

   c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

   d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

2. REPRESENTATIVE SAMPLING
   Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

3. RETENTION OF RECORDS
   The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Director at any time.

4. RECORD CONTENTS
   Records of monitoring information shall include:

   a. The date, exact place, and time of sampling or measurements;

b. The individual(s) who performed the sampling or measurements;

c. The date(s) and time(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

5. MONITORING PROCEDURES

a. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit or approved by the Regional Administrator.

b. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate records of such activities.

c. An adequate analytical quality control program, including the analyses of sufficient standards, spikes, and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory.

6. FLOW MEASUREMENTS
Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes.

D. REPORTING REQUIREMENTS

1. PLANNED CHANGES

a. INDUSTRIAL PERMITS
The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR Part 122.29(b); or,

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements listed at Part III.D.10.a.

b. MUNICIPAL PERMITS
Any change in the facility discharge (including the introduction of any new source or significant discharge or significant changes in the quantity or quality of existing discharges of pollutants) must be reported to the permitting authority. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

2. ANTICIPATED NONCOMPLIANCE
The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. TRANSFERS
This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.

4. DISCHARGE MONITORING REPORTS AND OTHER REPORTS
Monitoring results must be reported to EPA on either the electronic or paper Discharge Monitoring Report (DMR) approved formats. Monitoring results can be submitted electronically in lieu of the paper DMR Form. To submit electronically, access the NetDMR website at www.epa.gov/netdmr and contact the R6NetDMR.epa.gov in-box for further instructions. Until you

are approved for Net DMR, you must report on the Discharge Monitoring Report (DMR) Form EPA. No. 3320-1 in accordance with the "General Instructions" provided on the form. No additional copies are needed if reporting electronically, however when submitting paper form EPA No. 3320-1, the permittee shall submit the original DMR signed and certified as required by Part III.D.11 and all other reports required by Part III.D. to the EPA at the address below. Duplicate copies of paper DMR's and all other reports shall be submitted to the appropriate State agency (ies) at the following address (es):

EPA:
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN-W)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

New Mexico:
Program Manager
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
1190 Saint Francis Drive
Santa Fe, NM 87502-5469

5. ADDITIONAL MONITORING BY THE PERMITTEE
If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report (DMR). Such increased monitoring frequency shall also be indicated on the DMR.

6. AVERAGING OF MEASUREMENTS
Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

7. TWENTY-FOUR HOUR REPORTING

a. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall be provided within 5 days of the time the permittee becomes aware of the circumstances. The report shall contain the following information:

(1) A description of the noncompliance and its cause;

(2) The period of noncompliance including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and,

(3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

b. The following shall be included as information which must be reported within 24 hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit;

(2) Any upset which exceeds any effluent limitation in the permit; and,

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in Part II (industrial permits only) of the permit to be reported within 24 hours.

c. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

8. OTHER NONCOMPLIANCE
The permittee shall report all instances of noncompliance not reported under Parts III.D.4 and D.7 and Part I.B (for industrial permits only) at the time monitoring reports are submitted. The reports shall contain the information listed at Part III.D.7.

9. OTHER INFORMATION
Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

10. CHANGES IN DISCHARGES OF TOXIC SUBSTANCES
All existing manufacturing, commercial, mining, and silvacultural permittees shall notify the Director as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant listed at 40 CFR Part 122, Appendix D, Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) One hundred micrograms per liter (100 µg/L);
(2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2, 4-dinitro-phenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application; or

(4) The level established by the Director.

b. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 µg/L);

(2) One milligram per liter (1 mg/L) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application; or

(4) The level established by the Director.

11. SIGNATORY REQUIREMENTS
All applications, reports, or information submitted to the Director shall be signed and certified.

a. ALL PERMIT APPLICATIONS shall be signed as follows:

(1) FOR A CORPORATION - by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

(a)A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation; or,

(b)The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) FOR A PARTNERSHIP OR SOLE PROPRIETORSHIP - by a general partner or the proprietor, respectively.

(3) FOR A MUNICIPALITY, STATE, FEDERAL, OR OTHER PUBLIC AGENCY - by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(a)The chief executive officer of the agency, or

(b)A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

b. ALL REPORTS required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described above;

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility, or an individual or position having overall responsibility for environmental

matters for the company. A duly authorized representative may thus be either a named individual or an individual occupying a named position; and,

(3) The written authorization is submitted to the Director.

c. CERTIFICATION
Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

12. AVAILABILITY OF REPORTS
Except for applications, effluent data permits, and other data specified in 40 CFR 122.7, any information submitted pursuant to this permit may be claimed as confidential by the submitter. If no claim is made at the time of submission, information may be made available to the public without further notice.

E. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

1. CRIMINAL

a. NEGLIGENT VIOLATIONS
The Act provides that any person who negligently violates permit conditions implementing Section 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

b. KNOWING VIOLATIONS
The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. KNOWING ENDANGERMENT
The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than $250,000, or by imprisonment for not more than 15 years, or both.

d. FALSE STATEMENTS
The Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or by both. (See Section 309.c.4 of the Clean Water Act)

2. CIVIL PENALTIES
The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed $27,500 per day for each violation.

3. ADMINISTRATIVE PENALTIES
The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

a. CLASS I PENALTY
Not to exceed $11,000 per violation nor shall the maximum amount exceed $27,500.

b. CLASS II PENALTY
Not to exceed $11,000 per day for each day during which the violation continues nor shall the maximum amount exceed $137,500.

F. DEFINITIONS

All definitions contained in Section 502 of the Act shall apply to this permit and are incorporated herein by reference. Unless otherwise specified in this permit, additional definitions of words or phrases used in this permit are as follows:

1. ACT means the Clean Water Act (33 U.S.C. 1251 et. seq.), as amended.

2. ADMINISTRATOR means the Administrator of the U.S. Environmental Protection Agency.

3. APPLICABLE EFFLUENT STANDARDS AND LIMITATIONS means all state and Federal effluent standards and limitations to which a discharge is subject under the Act, including, but not limited to, effluent limitations, standards or performance, toxic effluent standards and prohibitions, and pretreatment standards.

4. APPLICABLE WATER QUALITY STANDARDS means all water quality standards to which a discharge is subject under the Act.

5. BYPASS means the intentional diversion of waste streams from any portion of a treatment facility.

6. DAILY DISCHARGE means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in terms of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the sampling day. "Daily discharge" determination of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the "daily discharge" determination of concentration shall be arithmetic average (weighted by flow value) of all samples collected during that sampling day.

7. DAILY MAXIMUM discharge limitation means the highest allowable "daily discharge" during the calendar month.

8. DIRECTOR means the U.S. Environmental Protection Agency Regional Administrator or an authorized representative.

9. ENVIRONMENTAL PROTECTION AGENCY means the U.S. Environmental Protection Agency.

10. GRAB SAMPLE means an individual sample collected in less than 15 minutes.

11. INDUSTRIAL USER means a non-domestic discharger, as identified in 40 CFR 403, introducing pollutants to a publicly owned treatment works.

12. MONTHLY AVERAGE (also known as DAILY AVERAGE) discharge limitations means the highest allowable average of "daily discharge(s)" over a calendar month, calculated as the sum of all "daily discharge(s)" measured during a calendar month divided by the number of "daily discharge(s)" measured during that month. When the permit establishes daily average concentration effluent limitations or conditions, the daily average concentration means the arithmetic average (weighted by flow) of all "daily discharge(s)" of concentration determined during the calendar month where C = daily concentration, F = daily flow, and n = number of daily samples; daily average discharge =

$$C_1F_1 + C_2F_2 + ... + C_nF_n$$

$$F_1 + F_2 + ... + F_n$$

13. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Act.

14. SEVERE PROPERTY DAMAGE means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

15. SEWAGE SLUDGE means the solids, residues, and precipitates separated from or created in sewage by the unit processes of a publicly owned treatment works. Sewage as used in this definition means any wastes, including wastes from humans, households, commercial establishments, industries, and storm water runoff that are discharged to or otherwise enter a publicly owned treatment works.

16. TREATMENT WORKS means any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage and industrial wastes of a liquid nature to implement Section 201 of the Act, or necessary to recycle or reuse water at

the most economical cost over the estimated life of the works, including intercepting sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances, extension, improvement, remodeling, additions, and alterations thereof.

17. UPSET means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

18. FOR FECAL COLIFORM BACTERIA, a sample consists of one effluent grab portion collected during a 24-hour period at peak loads.

19. The term "MGD" shall mean million gallons per day.

20. The term "mg/L" shall mean milligrams per liter or parts per million (ppm).

21. The term "µg/L" shall mean micrograms per liter or parts per billion (ppb).

22. MUNICIPAL TERMS

    a. 7-DAY AVERAGE or WEEKLY AVERAGE, other than for fecal coliform bacteria, is the arithmetic mean of the daily values for all effluent samples collected during a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The 7-day average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar week.

    b. 30-DAY AVERAGE or MONTHLY AVERAGE, other than for fecal coliform bacteria, is the arithmetic mean of the daily values for all effluent samples collected during a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. The 30-day average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar month.

    c. 24-HOUR COMPOSITE SAMPLE consists of a minimum of 12 effluent portions collected at equal time intervals over the 24-hour period and combined proportional to flow or a sample collected at frequent intervals proportional to flow over the 24-hour period.

    d. 12-HOUR COMPOSITE SAMPLE consists of 12 effluent portions collected no closer together than one hour and composited according to flow. The daily sampling intervals shall include the highest flow periods.

    e. 6-HOUR COMPOSITE SAMPLE consists of six effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.

    f. 3-HOUR COMPOSITE SAMPLE consists of three effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE
DALLAS, TEXAS 75202-2733

SEP 10 2010

CERTIFIED MAIL: RETURN RECEIPT REQUESTED (7009 2820 0001 8283 5087)

Mr. J. C. Lister
Rio Grande Resources
P.O. Box 1150
Grants, NM 87020

Re: NPDES Permit No. NM0028100
Change of Administrative Records

Dear Mr. Lister:

The permit recently issued to the Rio Grande Resources requires your facility perform toxicity testing as specified in section A, Part I of the permit. But, EPA accidentally omits the standard procedure for sampling and performance of toxicity testing. A copy of the toxicity testing procedure is enclosed for your record. EPA also changes the description of alpha from total alpha to adjusted gross alpha in accordance with State water quality standards (20.6.4.7B and 20.6.4.900J).

The corrected pages are enclosed.

If you have any questions on any aspect of this minor permit modification, please feel free to contact the permit writer, Isaac Chen, by telephone at:214-665-7364, FAX:214-665-2191, or E-mail: chen.isaac@epa.gov.

Sincerely yours,

Brent Larsen
Acting Chief
Permits & Technical Section (6WQ-PP)

Enclosure(s)

c w/ Enclosure: New Mexico Environment Department

PART I – REQUIREMENTS FOR NPDES PERMITS

SECTION A. LIMITATIONS AND MONITORING REQUIREMENTS

1. Outfalls 001

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge from Outfall 001. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS		DISCHARGE LIMITATIONS Standard Units		MONITORING REQUIREMENTS	
POLLUTANT	STORET CODE	MINIMUM	MAXIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
pH	00400	6.6	9.0	1/Day	Grab

EFFLUENT CHARACTERISTICS		DISCHARGE LIMITATIONS lbs/day, unless noted		mg/l, unless noted		MONITORING REQUIREMENTS	
POLLUTANT	STORET CODE	30-Day Avg	Daily Max	30-Day Avg	Daily Max	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	50050	Report MGD	Report MGD	***	***	Continuous	Totalizing Meter
Total Suspended Solids	00530	N/A	N/A	20	30	1/Day	Grab
Chemical Oxygen Demand	00340	N/A	N/A	100	125	1/Day	Grab
Ra226 (dissolved)	09503	N/A	N/A	3 pCi/l	10 pCi/l	1/Day	Grab
Total Ra226	09501	N/A	N/A	10 pCi/l	30 pCi/l	1/Day	Grab
Total Ra226+Ra228	11503	N/A	N/A	20 pCi/l	30 pCi/l	1/Day	Grab
Total Uranium	22706	N/A	N/A	2.0	4.0	1/Day	Grab
Total Zinc	01092	N/A	N/A	0.5	1.0	1/Day	Grab
Total Aluminum	01105	N/A	N/A	3.3	5.0	1/Day	Grab
Total Boron	01022	N/A	N/A	0.5	0.75	1/Day	Grab
Total Cadmium	01027	N/A	N/A	0.06	0.1	1/Day	Grab
Total Chromium	01034	N/A	N/A	0.32	0.48	1/Day	Grab
Total Cobalt	01037	N/A	N/A	0.033	0.05	1/Day	Grab
Total Copper	01042	N/A	N/A	0.35	0.53	1/Day	Grab

Total Mercury	71900	N/A	N/A	0.51 µg/l	0.77 µg/l	1/Day	Grab
Total Molybdenum	01062	N/A	N/A	0.67	1.0	1/Day	Grab
Total Selenium	01147	N/A	N/A	3.3 µg/l	5.0 µg/l	1/Day	Grab
Total Vanadium	01087	N/A	N/A	0.067	0.1	1/Day	Grab
Adjusted Gross Alpha (*1)	80029	N/A	N/A	10 pCi/l	15 pCi/l	1/Day	Grab
E. coli	51040	N/A	N/A	126 cfu/100 ml	410 cfu/100 ml	1/Day	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
WHOLE EFFLUENT TOXICITY TESTING (*1) (48-Hour Static Renewal)	30-DAY AVG MINIMUM	48-HR MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Daphnia pulex	Report	Report	1/3 Months (*1)	24-Hr Composite

Footnotes:

*1 Adjusted gross alpha means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample, including radium-226, but excluding radon-222 and uranium.

*2 Monitoring frequency 1/3-month for the 1st year of the permit. If all tests pass, reduce the frequency to 1/6-month for years 2 – 5, and resume the frequency of 1/3-month on the last day of the permit. If any test fails during the period of the permit, return the frequency to 1/3-month for the remainder of the permit.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfalls 001.

F. WHOLE EFFLUENT TOXICITY TESTING (48-HOUR ACUTE NOEC FRESHWATER)

It is unlawful and a violation of this permit for a permittee or his designated agent, to manipulate test samples in any manner, to delay sample shipment, or to terminate or to cause to terminate a toxicity test. Once initiated, all toxicity tests must be completed unless specific authority has been granted by EPA Region 6 or the State NPDES permitting authority.

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL(S):	001
REPORTED AS FINAL OUTFALL:	001
CRITICAL DILUTION (%):	100
EFFLUENT DILUTION SERIES (%):	32, 42, 56, 75, 100
COMPOSITE SAMPLE TYPE:	Defined at PART I
TEST SPECIES/METHODS:	40 CFR Part 136

Daphnia pulex acute static renewal 48-hour definitive toxicity test using EPA-821-R-02-012, or the latest update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

b. The NOEC (No Observed Lethal Effect Concentration) is defined as the greatest effluent dilution at and below which lethality that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Acute test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution.

c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

d. Test failure is defined as a demonstration of statistically significant lethal effects to a test species at or below the effluent critical dilution.

e. This permit does not establish requirements to automatically increase the WET testing frequency after a test failure, or to begin a toxicity reduction evaluation (TRE) in the event of multiple test failures. However, upon failure of any WET test, the permittee must report the test results to NMED, Surface Water Quality Bureau, in writing, within 5 business days of notification the test failure. NMED will review the test results and determine the appropriate action necessary, if any.

2. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

i. Each toxicity test control (0% effluent) must have a survival equal to or greater than 90%.

ii. The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent).

iii. The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal effects are exhibited.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

b. Statistical Interpretation

The statistical analyses used to determine if there is a statistically significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA-821-R-02-012 or the most recent update thereof.

If the conditions of Test Acceptability are met in Item 2.a above and the percent survival of the test organism is equal to or greater than 90% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report an NOEC of not less than the critical dilution for the reporting requirements found in Item 3 below.

c. Dilution Water

i. Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;

(A) toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and
(B) toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

ii. If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 3.a), the permittee may substitute synthetic dilution water for the receiving water in all

subsequent tests provided the unacceptable receiving water test met the following stipulations:

(A) a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;

(B) the test indicating receiving water toxicity has been carried out to completion (i.e., 48 hours);

(C) the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 4 below; and

(D) the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

i. The permittee shall collect two flow-weighted composite samples from the outfall(s) listed at Item 1.a above.

ii. The permittee shall collect a second composite sample for use during the 24-hour renewal of each dilution concentration for the tests. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 36 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 6 degrees Centigrade during collection, shipping, and/or storage.

iii. The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.

iv. If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 3 of this section.

3. REPORTING

a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this Part in accordance with the Report Preparation Section of EPA-821-R-02-012, for every valid or invalid toxicity test initiated, whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of PART III.C.3 of this permit. The permittee shall submit full reports upon the specific request of the Agency. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review.

b. A valid test for each species must be reported during each reporting period specified in PART I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only ONE set of biomonitoring data for each species is to be recorded for each reporting period. The data submitted should reflect the LOWEST Survival results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached for EPA review.

c. The permittee shall report the following results of each valid toxicity test. Submit retest information, if required, clearly marked as such. Only results of valid tests are to be reported.

i. Daphnia pulex

(A) If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D.

(B) Report the NOEC value for survival, Parameter No. TOM3D.

(C) Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQM3D.

d. If retests are required by NMED, enter the following codes:

i. For retest number 1, Parameter 22415, enter a "1" if the NOEC for survival is less than the critical dilution; otherwise, enter a "0."

ii. For retest number 2, Parameter 22416, enter a "1" if the NOEC for survival is less than the critical dilution; otherwise, enter a "0."

United States Environmental Protection Agency (EPA)
National Pollutant Discharge Elimination System (NPDES)

MULTI-SECTOR GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY (MSGP)

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act (CWA), as amended (33 U.S.C. 1251 *et seq.*), operators of stormwater discharges associated with industrial activity located in an area identified in Appendix C where EPA is the permitting authority are authorized to discharge to waters of the United States in accordance with the eligibility and Notice of Intent (NOI) requirements, effluent limitations, inspection requirements, and other conditions set forth in this permit. This permit is structured as follows:

- general requirements that apply to all facilities are found in Parts 1 through 7;
- industry sector-specific requirements are found in Part 8; and
- specific requirements that apply in individual States and Indian Country Lands are found in Part 9.

The Appendices (A through K) contain additional permit conditions that apply to all operators covered under this permit.

This permit becomes effective on September 29, 2008.

This permit and the authorization to discharge expire at midnight, September 29, 2013.

Robert W. Varney, Regional Administrator
EPA Region 1

Carl-Axel P. Soderberg, Division Director, Caribbean Environmental Protection Division
EPA Region 2

Jon M. Capacasa, Director, Water Protection Division
EPA Region 3

Timothy C. Henry, Acting Director, Water Division
EPA Region 5

Miguel I. Flores, Director, Water Quality Protection Division
EPA Region 6

Alexis Strauss, Director, Water Division
EPA Region 9

Michael Gearheard, Director, Office of Water and Watersheds
EPA Region 10

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
EPA's NOI PROCESSING CENTER

12/15/2008
Company: RIO GRANDE RESOURCES CORPORATION
ATTN: JOE LISTER
PO Box 1150
Grants, NM 87020
Permit Number: NMR05GB27

Facility: MT. TAYLOR MINE
Hwy 605 North, 1 m north San Mateo
San Mateo, NM 87020

This email/letter acknowledges that you have submitted a complete Notice of Intent form to be covered under the NPDES General Permit for Stormwater Discharges for Multi-Sector General Permit Activity (Multi-Sector General Permit). Coverage under this permit begins at the conclusion of your thirty-day waiting period, on 01/14/2009.

As stated above, this letter acknowledges receipt of a complete Notice of Intent. However, it is not an EPA determination of the validity of the information you provided. Your eligibility for coverage under the Permit is based on the validity of the certification you provided. Your signature on the Notice of Intent certifies that you have read, understood, and are implementing all of the applicable requirements. An important aspect of this certification requires that you correctly determine whether you are eligible for coverage under this permit.

As you know, the Multi-Sector General Permit requires you to have developed and begun implementing a Stormwater Pollution Prevention Plan (SWPPP) and outlines important inspection and record keeping requirements. You must also comply with any additional location-specific requirements applicable to your state or tribal area. A copy of the Multi-Sector General Permit must be kept with your SWPPP. An electronic copy of the Permit and additional guidance materials can be viewed and downloaded at www.epa.gov/npdes/stormwater.

For tracking purposes, the following number has been assigned to your Notice of Intent Form: NMR05GB27.

If you have general questions regarding the stormwater program or your responsibilities under the Multi-Sector General Permit, please call

EPA Region 6

Brent Larsen (214) 665-7523

If you have questions about your Notice of Intent form, please call the EPA NOI Processing Center at 1-866-352-7755 (toll free) or send an inquiry via the online form at http:///www.epa.gov/npdes/noicontact.

Next time, you can use the eNOI system (http://www.epa.gov/npdes) to apply for a Notice of Intent.

EPA NOI Processing Center
Operated by Avanti Corporation
1200 Pennsylvania Ave., NW
Mail Code: 4203M
Washington, DC 20460
1-866-352-7755

NPDES FORM 3510 -6

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460
NOTICE OF INTENT (NOI) FOR STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY UNDER THE NPDES MULTI-SECTOR GENERAL PERMIT

Form Approved. OMB No. 2040-0086

Submission of this completed Notice of Intent (NOI) constitutes notice that the operator identified in Section B of this form requests authorization to discharge pollutants to waters of the United States from the facility or site identified in Section C under EPA's NPDES Stormwater Multi-Sector General Permit (MSGP) for industrial stormwater. Submission of this NOI constitutes your notice to EPA that the facility identified in Section C of this form meets the eligibility conditions of Part 1.1 of the MSGP. Please read and make sure you comply with all eligibility requirements, including the requirement to prepare a stormwater pollution prevention plan. Refer to the instructions at the end of this form to complete your NOI.

A. Permit Number: NMR050001 (see Appendix C of the MSGP for the list of eligible permit numbers)

Tracking Number (EPA Use Only):

B. Facility Operator Information

1. Name: RIO GRANDE RESOURCES CORP

2. IRS Employer Identification Number (EIN): 94 - 3140665

3. Mailing Address:

a. Street: PO BOX 1150

b. City: GRANTS c. State: NM d. Zip Code: 87020 -

e. Phone: 505 - 287 - 7971 f. Fax (optional): 505 - 287 - 5051 g. E-mail: joe.lister1@gmail.com

C. Facility Information

1. Facility Name: MT. TAYLOR MINE

2. Have stormwater discharges from your site been covered previously under an NPDES permit? ☑ YES ☐ NO

a. If yes, provide the Tracking Number if you had coverage under EPA's MSGP 2000 or the NPDES permit number if you had coverage under an EPA individual permit. NMR05A809

b.1 If no, was your facility in operation and discharging stormwater prior to October 30, 2005? ☐ YES ☐ NO

b.2 If no to C.2.b.1, did your facility commence discharging after October 30, 2005 and before January 5, 2009? ☐ YES ☐ NO

3. Location Address:

a. Street 23 MILES NORTH ON HWY 605 NORTH

b. City: SAN MATEO

c. County or similar government subdivision: CIBOLA d. State: NM e. Zip Code: 87020 -

f. Latitude: (use any one of the three formats provided.)
1. 35 · 20 · 30 - N (degrees, minutes, seconds)
2. ___ ° ___ . ___ ' N (degrees, minutes, decimal)
3. ___ . ___ ___ ° N (degrees decimal)

g. Longitude: (use any of these 3 formats)
1. 107 · 38 · 00 - W (degrees, minutes, seconds)
2. ___ ° ___ . ___ ' W (degrees, minutes, decimal)
3. ___ . ___ ___ ° W (degrees decimal)

h. Lat/Long Data Source: ☑ USGS topographic map ☐ EPA web site ☐ GPS ☐ Other: _____

If you used a USGS topographic map, what was the scale? 1" = 2000'

4. Estimated area of industrial activity at your site exposed to stormwater: 120 (acres)

5. Is this a federal facility? ☐ YES ☑ NO

6. Is your facility located on Indian Country lands? ☐ YES ☑ NO

If yes, name of reservation, or if not part of a reservation, put "Not Applicable:" _____

D. Discharge Information

1. Does your facility discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ YES ☑ NO

If yes, name of MS4 operator: ______

2. Receiving Waters and Wetlands (**Note**: If additional space is needed for this question, fill out Attachment 1.)

a. What is the name(s) of your receiving water(s) that receive stormwater directly and/or through an MS4)? If your receiving water is impaired then identify the name of the impaired segment, if applicable, in parentheses following the receiving water name.	b. Are any of your discharges directly into any segment of an "impaired" water?	If you answered yes to question D.2.b, then answer the following three questions: b.1. What pollutant(s) are causing the impairment?	b.2. Are the pollutant(s) causing the impairment present in your discharge?	b.3. Has a TMDL been completed for the pollutant(s) causing the impairment?
TRIBUTARY OF SAN MATEO CREEK	☐ YES ☑ NO		☐ YES ☐ NO	☐ YES ☐ NO
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO

3. Water Quality Standards (for new dischargers only)

a. Are any of your discharges into any portion of a receiving water designated by the state or tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water)? ☐ YES ☑ NO

b. Has the receiving water(s) been designated by the state or tribal authority under its antidegradation policy as a Tier 3 water (Outstanding Natural Resource Water)? ☐ YES ☑ NO

4. Federal Effluent Limitation Guidelines and Sector-Specific Requirements

a. Are you requesting permit coverage for any stormwater discharges subject to effluent limitation guidelines? ☐ YES ☑ NO

b. If yes, which effluent limitation guidelines apply to your stormwater discharges?

40 CFR Part/Subpart	Eligible Discharges	Affected MSGP Sector	Check if Applicable
Part 411, Subpart C	Runoff from material storage piles at cement manufacturing facilities	E	☐
Part 418 Subpart A	Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished product, by-products or waste products (SIC 2874)	C	☐
Part 423	Coal pile runoff at steam electric generating facilities	O	☐
Part 429, Subpart I	Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas	A	☐
Part 436, Subpart B, C, or D	Mine dewatering discharges at crushed stone mines, construction sand and gravel mines, or industrial sand mines	J	☐
Part 443, Subpart A	Runoff from asphalt emulsion facilities	D	☐
Part 445, Subparts A & B	Runoff from hazardous waste and non-hazardous waste landfills	K, L	☐

c. If you are a Sector S (Air Transportation) facility, do you anticipate using more than 100,000 gallons of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis? ☐ YES ☐ NO

5. Identify the 4-digit Standard Industrial Classification (SIC) code or 2-letter Activity Code that best represents the products produced or services rendered for which your facility is primarily engaged, as defined in MSGP:

Primary SIC Code: 1094 OR Primary Activity Code ☐☐

6. Identify the applicable sector(s) and subsector(s) of industrial activity, including co-located industrial activity, for which you are requesting permit coverage:

a. Sector G Subsector 2 b. Sector ☐☐ Subsector ☐ c. Sector ☐☐ Subsector ☐

d. Sector ☐☐ Subsector ☐ e. Sector ☐☐ Subsector ☐ f. Sector ☐☐ Subsector ☐

7.a. Is your site presently inactive and unstaffed? ☐ YES ☑ NO

b1. If yes, is your site expected to be inactive and unstaffed for the entire permit term? ☐ YES ☐ NO

b2. If you select "no" in 7.b1 above, then indicate the length of time that you expect your facility to be inactive and unstaffed ______

E. Stormwater Pollution Prevention Plan (SWPPP) Contact Information

1a. SWPPP Contact Name: JOE LISTER

b. Phone: 505-287-7971 Ext. ___ c. E-mail: _____

2. URL of SWPPP (if applicable): _____

F. Endangered Species Protection

1. Using the instructions in Appendix E of the MSGP, under which criterion listed in Part 1.1.4.5 are you eligible for coverage under this permit?

☑ A ☐ B ☐ C ☐ D ☐ E ☐ F

2. If you select criterion E from Part 1.1.4.5:

a. What federally-listed species or federally-designated critical habitat are in your "action area?" _____

b. List the pollutants expected to be present in your discharge _____

c. If you are an existing discharger, do you have effluent monitoring data from EPA's MSGP 2000, or another previous NPDES permit? ☐ YES ☐ NO

c.1 If no, why not? ☐ No monitoring required for my sector ☐ Inactive/unstaffed site ☐ Other _____

c.2 Do you have any other data characterizing pollutants in your stormwater (describe)? _____

c.3 If you have benchmark monitoring data, did you exceed any of the applicable benchmarks? ☐ YES ☐ NO

c.4 Did you exceed any applicable effluent limitation guideline or cause or contribute to an exceedance of a State or Tribal water quality standard? ☐ YES ☐ NO

c.5 If you answered "yes" to either question F.2.c.3 or F.2.c.4 above, for what pollutant(s)? _____

d. Attach documentation supporting criterion E eligibility. Documentation should address species and habitat listed in F.2.a and the potential effects of pollutants listed in F.2.b (including any monitoring data for these pollutants) on the listed species and habitat.

3. If you select criterion F from Part 1.1.4.5, provide the operator's NPDES Tracking Number under which you are certifying eligibility: _____

G. Historic Preservation

Using the instructions in Appendix F of the MSGP, under which criterion listed in Part 1.1.4.6 are you eligible for coverage under this permit?

☑ A ☐ B ☐ C ☐ D

H. Certifier Name and Title

I certify under penalty of law that I meet the eligibility conditions of this permit and that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Print Name: J C LISTER

Title: MINE MANAGER

Signature: _____ Date: 12/10/08

E-mail: joe.lister1@gmail.com

NOI Preparer (Complete if NOI was prepared by someone other than the certifier)

Prepared by: _____

Organization: _____

Phone: ___-___-____ Ext. ___ E-mail: _____

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

State of New Mexico
ENVIRONMENT DEPARTMENT
Environmental Protection Division
Radiation Control Bureau
Marquez Building
525Camino de los Marquez, Suite 1
Post Office Box 5469
Santa Fe, New Mexico 87502-5469
Telephone (505) 476-8600
Fax (505) 476-8654
www.nmenv.state.nm.us/nmrcb/home.html

DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

MARY ROSE
Acting Director

November 20, 2012

Joel C. Lister, Manger
Rio Grande Resources Corporation
P.O. Box 1150
Grant, NM 87020

License No. SO 043
Amendment No. 09

Re: License Renewal

Dear Mr. Lister:

Please find the enclosed Amendment Number 09 to the New Mexico Radioactive Materials License Number SO 043. This license has been renewed for an additional five years. The new expiration date is December 31, 2017. Carefully review the contents and assure a complete understanding of all conditions in the License and immediately report any errors or omissions to the Radiation Control Bureau.

The New Mexico radioactive material licensee is required to be familiar with applicable parts of 20.3 NMAC. Copies of these regulations are available through the internet at:

www.nmenv.state.nm.us./nmrcb/home.html.

A move to a different location requires you to notify and receive authorization from this Department at least thirty days in advance. Any sale or transfer of licensed material must be in accordance with 20.3.3.317.B. NMAC.

You are required to possess a copy of this license at all work locations within New Mexico. Should you have any questions, please call me at (505) 476-8600.

Sincerely,

Santiago M. Rodriguez, Program Manager
Radiation Control Bureau

SUSANA MARTINEZ
Governor
JOHN SANCHEZ
Lieutenant Governor

State of New Mexico
ENVIRONMENT DEPARTMENT
Environmental Protection Division
Radiation Control Bureau
Marquez Building
525 Camino de los Marquez, Suite 1
P. O. Box 5469
Santa Fe, New Mexico 87502-5469
Telephone number: (505) 476-8600
Fax number:(505) 476-8654
www.nmenv.state.nm.us/nmrcb/home.html

DAVE MARTIN
Secretary
BUTCH TONGATE
Deputy Secretary
MARY ROSE
Acting Director

RADIOACTIVE MATERIAL LICENSE

Pursuant to Sections 74-3-1 through 74-3-16 NMSA 1978, and 20.3.3 NMAC, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated in this license; and to use said radioactive material(s) for the purpose(s) and at the place(s) designated herein. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect, of the New Mexico Environment Department and to any conditions specified herein.

1. License Name Rio Grande Resources Corporation	**2. License Number** SO043-09
3a. Address P.O. Box 1150 Grants NM 87020	**3b. Actual Location of Operation** From Milan, North on State Hwy. 605 to San Mateo, then 1/2 mile NE to Mt. Taylor Mine.
4. Telephone (505) 287-7971	**5. Expiration Date** December 31, 2017

Date: November 20, 2012

For the New Mexico Environment Department

Santiago M. Rodriguez, Program Manager (vrb)
Radiation Protection Program

Attachments:
1) Radioactive Material Specifications
2) Authorized Use(s) and License Conditions

ATTACHMENT 1 - RADIOACTIVE MATERIAL SPECIFICATIONS

LICENSE NUMBER SO043-09

6. RADIOACTIVE MATERIALS (element and mass number)	7. FORM (chemical or physical)	8. MAXIMUM QUANTITY (Licensee may possess at any one time)
A. Cesium 137.	A. Sealed source (New England Nuclear, Model NER-580A).	A. One source not to exceed 110 millicuries, total.
C. Radium 226.	C. Chloride in a pure silicon matrix (Geoco, Inc. custom calibration standards).	C. One source not to exceed 0.25 microcurie, total.

END OF THIS SECTION

LICENSE NUMBER SO043-09

9. Authorized Use:

A. and B. For storage only.

10. The licensee shall comply with the provisions of 20.3.3, 20.3.4, 20.3.10, and 20.3.16 NMAC.

11. The Secretary of the Department or the Secretary's authorized representatives shall be allowed to enter the premises and inspect the radiation related activities at all reasonable times. Failure of the licensee to admit the Secretary or the Secretary's authorized representatives shall constitute grounds for issuance of an immediate cease and desist order.

12. Thirty (30) days before vacating or relinquishing possession or control of the premises specified in Item 3.b of this license, the licensee shall notify the Department in writing of the intent to vacate and the address of relocation.

13. The Radiation Safety Officer for this license is Stanley A. Fitch, CHP.

14. Licensed material shall only be used by, or under the supervision and in the physical presence of, Stanley A. Fitch and Joel Lister.

15. The licensee shall conduct a physical inventory every 6 months to account for all sealed sources and devices received and possessed under the license. Records of the inventories shall be maintained for 5 years from the date of each inventory for inspection by the Department. The inventory record shall include the identity of the radionuclide for each source and its activity, the make and model number of each source and device, the serial number of each source and device, the location of each source and device, the date of the inventory, and the name of the individual making the inventory.

16. The licensee shall maintain utilization records of each use of licensed material showing:

A. The make, model number, and a serial number or a description of each sealed source or device used;

B. The date and location of use of licensed material;

C. The identity of the user responsible for the licensed material; and

D. The date and time when the licensed material or device was returned to the storage location. Utilization records shall be retained for 3 years from the date of the recorded event and made available for inspection by the Department.

17. Leak Tests:
A. Each sealed source containing licensed material, other than hydrogen 3, with a half-life greater than thirty days and in any form other than gas, shall be tested for contamination and leakage at intervals not to exceed the intervals specified in the Certificate of Registration issued by the NRC or an Agreement State. In the absence of a certificate from a transferor indicating that a test has been

made within the interval specified in the Certificate of Registration prior to the transfer, a sealed source received from another person shall not be put into use until tested.

A1. Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries of beta and gamma emitting material or 10 microcuries or less of alpha emitting material.

A2. The periodic test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within the interval specified in the Certificate of Registration issued by the NRC or an Agreement State prior to the date of use or transfer.

B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak tests shall be kept in units of microcuries and maintained for 5 years for inspection by the Department.

C. If the leak test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Department regulations. A report shall be filed within 5 days of the test result with the New Mexico Environment Department, Radiation Protection Program, P.O. Box 5469, Santa Fe, New Mexico 87502, describing the equipment involved, the test result and the corrective action taken.

D. Tests for leakage and/or contamination shall be performed by persons specifically licensed by the Department, NRC or an Agreement State to perform such services.

18. In addition to the notification requirements in 20.3.3 and 20.3.4 NMAC, each licensee shall report immediately any compromise to the integrity of any sealed sources or devices containing radioactive materials.

19. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

20. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6., 7., and 8., of the license in accordance with statements, representations and procedures contained in, referenced in, or enclosed with the documents listed below. The most recent statements, representations, and procedures shall govern if they conflict with previously submitted documents:

Amendment #
08 Application with attachments (only those referencing storage of the sealed sources) dated November 12, 2010.
09 Renewal application with attachments dated November 5, 2012.

END OF THIS SECTION.

J. G. di Zerega
K. S. Barnhill ← HIS COPY FOR
J. L. Mackin

JERRY APODACA
GOVERNOR

STATE OF NEW MEXICO

GEORGE S. GOLDSTEIN, Ph.D.
SECRETARY FOR HEALTH & ENVIRON

ENVIRONMENT department

ENVIRONMENTAL IMPROVEMENT DIVISON
SOLID WASTE MANAGEMENT UNIT
P.O. Box 968
Santa Fe, New Mexico 87503
Telephone: (505) 827-5271

RECEIVED
K.S. BARNHILL
FEB 28 1980
GULF MINERAL RESOURCES CO.
MT. TAYLOR PROJECT

RECEIVED
FEB 22 1980
W. L. ROGERS

CERTIFICATE OF REGISTRATION

This is to certify that GULF OIL CORPORATION has filed an application with the Environmental Improvement Division in compliance with Section 103 of the New Mexico Environmental Improvement Division, Solid Waste Regulations.

RECEIVED
FEB 29 1980
L. E. LEWIS

DATE: FEBRUARY 18, 1980

CERTIFICATION OFFICER

COMMENTS:

None.

JDT/lr

Gulf Mineral Resources Co.

F. S. Mooney
SENIOR VICE PRESIDENT

1720 So. Bellaire St.
Denver, Colo. 80222

RECEIVED
FEB 21 1980
L. E. LEWIS

February 11, 1980

Mr. Thomas E. Baca
New Mexico Environmental Improvement Division
P. O. Box 968
Santa Fe, New Mexico 87503

Dear Mr. Baca:

Attached are registrations for solid waste disposal sites in accordance with the New Mexico Solid Waste Regulations, for the Mt. Taylor Mine and Mill.

Should any questions arise, please contact Mr. Philip W. Morton, (303) 758-1700, or the undersigned.

Very truly yours,

GULF OIL CORPORATION

F. S. Mooney
Sr. Vice President,
Uranium Operations and Marketing

FSM:PWM:rw
Attachments

cc: J. L. Mackin - NMEID
R. Krehoff - NMEID

Application for registration of solid waste collection, transportation, and disposal systems.

Section 103. of the New Mexico Environmental Improvement Agency Solid Waste Regulation states:

103. REGISTRATION. --

A. At least thirty days prior to the creation or modification of a system for the collection, transportation, or disposal of solid waste, the person who is operating or will operate the system shall obtain a registration certificate from the agency.

B. Any person who is operating a system for the collection, transportation, or disposal of solid waste on October 19, 1974, shall obtain a registration certificate by December 19, 1974.

C. Any person who seeks a registration certificate shall file a written application with the Solid Waste Management Section of this agency. Application forms may be obtained from the agency. Application shall:

(Please complete all of the following where applicable.)

1. Date of Application: February 11, 1980

2. Name and address of applicant Gulf Oil Corporation, Acting by and through its division, Gulf Mineral Resources Co., 1720 South Bellaire Street, Denver, Colorado 80222 Telephone 303/758-1700

3. Type of storage containers required for: Not Applicable

   a. Residences _____

   b. Commercial establishments _____

   c. Institutions _____

   d. Industries _____

   e. Recreational facilities _____

4. Number of accounts to be served, or being served: Not Applicable

   a. Residential _____

   b. Commercial _____

   c. Institutional _____

   d. Industrial _____

5. Refuse Collection vehicles: Not Applicable

a. Number _____

b. Type _____

_____

c. Capacity _____

_____

d. Condition _____

_____

_____

6. Number of crew members provided for each collection vehicle. Not applicable

7. Collection Frequency: Not Applicable

a. Residential _____

b. Commercial _____

c. Institutional _____

d. Industrial _____

e. Recreational _____

8. Collection Days: Not Applicable

a. Residential (circle) M T W Th F Sat. Sun.

b. Commercial (circle) M T W Th F Sat. Sun.

c. Institutional (circle) M T W Th F Sat. Sun.

d. Industrial (circle) M T W Th F Sat. Sun.

e. Recreational (circle) M T W Th F Sat. Sun.

9. The transport distance from the nearest and farthest points to the dispos site. On-site disposal

_____

10. The type of disposal:

a. Sanitary Landfill _____

b. Modified Landfill X

d. Incineration _____

e. Open dump _____

11. Disposal site:

a. Location Section 24, T13N, R8W, McKinley County, New Mexico

b. Ownership Gulf Oil Corporation

c. Life expectancy 20 years

d. Acreage 25 acres (approx);

e. General topography please refer to attached map

f. Location of any water courses or water wells on or within 200 feet of th the disposal site. Marquez Creek, an intermittant stream flows thru section

12. A brief statement describing the plan of operation of the existing system and the proposed system. Gulf proposes to open, on Gulf owned property, for its exclu use, in accordance with Section 108D, Solid Waste Management Regulations a waste disposal area, on the north east portion of the Mt. Taylor Mine site as indicated on th attached map. The site will be generally maintained as a modified sanitary landfill, with any waste, which is subject to wind movement, contained in plastic bags. Concurrently, Gulf proposes to discontinue use of its existing waste disposal site located in the Southwest corner of the mine site property.

F. S. Mooney, Attorney-in-Fact

Application for registration of solid waste collection, transportation, and disposal systems.

Section 103. of the New Mexico Environmental Improvement Agency Solid Waste Regulation states:

103. REGISTRATION. --

A. At least thirty days prior to the creation or modification of a system for the collection, transportation, or disposal of solid waste, the person who is operating or will operate the system shall obtain a registration certificate from the agency.

B. Any person who is operating a system for the collection, transportation, or disposal of solid waste on October 19, 1974, shall obtain a registration certificate by December 19, 1974.

C. Any person who seeks a registration certificate shall file a written application with the Solid Waste Management Section of this agency. Application forms may be obtained from the agency. Application shall:

(Please complete all of the following where applicable.)

1. Date of Application: February 11, 1980

2. Name and address of applicant GULF OIL CORPORATION, acting by and through its division, GULF MINERAL RESOURCES CO., 1720 South Bellaire Street, Denver, Colorado 80222, Telephone (303) 758-1700

3. Type of storage containers required for: NOT APPLICABLE

   a. Residences _____

   b. Commercial establishments _____

   c. Institutions _____

   d. Industries _____

   e. Recreational facilities _____

4. Number of accounts to be served, or being served: NOT APPLICABLE

   a. Residential _____

   b. Commercial _____

   c. Institutional

5. Refuse Collection Vehicles: NOT APPLICABLE

a. Number _____

b. Type _____

_____

c. Capacity _____

_____

d. Condition _____

_____

_____

6. Number of crew members provided for each collection vehicle. NOT APPLICABLE

7. Collection Frequency: NOT APPLICABLE

a. Residential _____

b. Commercial _____

c. Institutional _____

d. Industrial _____

e. Recreational _____

8. Collection Days: NOT APPLICABLE

a. Residential (circle) M T W Th F Sat. Sun.

b. Commercial (circle) M T W Th F Sat. Sun.

c. Institutional (circle) M T W Th F Sat. Sun.

d. Industrial (circle) M T W Th F Sat. Sun.

e. Recreational (circle) M T W Th F Sat. Sun.

9. The transport distance from the nearest and farthest points to the disposa site. On-site disposal.

_____

10. The type of disposal:

a. Sanitary Landfill _____

b. Modified Landfill X

d. Incineration _____

e. Open dump _____

11. Disposal site:

a. Location Section 1, T13N, R8W, McKinley County, New Mexico

b. Ownership Fernandez

c. Life expectancy 20 years

d. Acreage 5 acres (approx.)

e. General topography Please refer to Section 2.4 of Gulf's Mt. Taylor Uranium Mill License Application for a complete description of the project area and environs.

f. Location of any water courses or water wells on or within 200 feet of the the disposal site. Please see Section 2.6 of the Mt. Taylor Uranium Mill License Application and the Mt. Taylor Uranium Mill Discharge Plan, Section IV, both on file with the NMEID Radiation Protection Section.

12. A brief statement describing the plan of operation of the existing system and/or the proposed system. Gulf proposes to operate a modified landfill, for Gulf's exclusive use, within the fenced boundary of its proposed uranium mill as shown on the attached map. The definitive location, design and operation parameters have not at this time been determined. Gulf intends to comply with the requirements of Section 108F, New Mexico Solid Waste Management regulations.

As further information becomes available it will be forwarded to your office.

Anticipated operation date of the modified landfill is September 1, 1980.

Attorney

F. S. Mooney
Attorney-in-Fact

Authorization ID: MOT220
Contact ID: RIOGRAND,WATER
Expiration Date: 12/31/2028
Use Code: 914

FS-2700-4 (03/06)
OMB 0596-0082

U.S. DEPARTMENT OF AGRICULTURE
Forest Service
SPECIAL USE PERMIT
AUTHORITY:
FEDERAL LAND POLICY AND MGMT ACT, AS AMENDED October 21, 1976

RIO GRANDE RESOURCES CORPORATION of ATTN: LAND DEPARTMENT, P.O. BOX 1000, HOBSON, TX 78117 (hereinafter called the Holder) is hereby authorized to use or occupy National Forest System lands, to use subject to the conditions set out below, on the Cibola National Forest or Mt. Taylor Ranger District of the National Forest System.

This permit covers 3.35 acres, and/or .01 miles and is described as: Sec. 12, T. 13 N., R. 8 W., NEW MEXICO PRINCIPAL MERIDIAN as shown on the location map attached to and made a part of this permit, and is issued for the purpose of:

Transport mine discharge water.

The above described or defined area shall be referred to herein as the "permit area".

TERMS AND CONDITIONS

I. AUTHORITY AND GENERAL TERMS OF THE PERMIT

A. Authority. This permit is issued pursuant to the authorities enumerated at Title 36, Code of Federal Regulations, Section 251 Subpart B, as amended. This permit, and the activities or use authorized, shall be subject to the terms and conditions of the Secretary's regulations and any subsequent amendment to them.

B. Authorized Officer. The authorized officer is the Forest Supervisor or a delegated subordinate officer.

C. License. This permit is a license for the use of federally owned land and does not grant any permanent, possessory interest in real property, nor shall this permit constitute a contract for purposes of the Contract Disputes Act of 1978 (41 U.S.C. 611). Loss of the privileges granted by this permit by revocation, termination, or suspension is not compensable to the holder.

D. Amendment. This permit may be amended in whole or in part by the Forest Service when, at the discretion of the authorized officer, such action is deemed necessary or desirable to incorporate new terms, conditions, and stipulations as may be required by law, regulation, land management plans, or other management decisions.

E. Existing Rights. This permit is subject to all valid rights and claims of third parties. The United States is not liable to the holder for the exercise of any such right or claim.

F. Nonexclusive Use and Public Access. Unless expressly provided for in additional terms, use of the permit area is not exclusive. The Forest Service reserves the right to use or allow others to use any part of the permit area, including roads, for any purpose, provided, such use does not materially interfere with the holder's authorized use. A final determination of conflicting uses is reserved to the Forest Service.

G. Forest Service Right of Entry and Inspection. The Forest Service has the right of unrestricted access of the permitted area or facility to ensure compliance with laws, regulations, and ordinances and the terms and conditions of this permit.

H. Assignability. This permit is not assignable or transferable. If the holder through death, voluntary sale or transfer, enforcement of contract, foreclosure, or other valid legal proceeding ceases to be the owner of the improvements, this permit shall terminate.

I. Permit Limitations. Nothing in this permit allows or implies permission to build or maintain any structure or facility, or to conduct any activity unless specifically provided for in this permit. Any use not specifically identified in this permit must be approved by the authorized officer in the form of a new permit or permit amendment.

II. TENURE AND ISSUANCE OF A NEW PERMIT

A. Expiration at the End of the Authorized Period. This permit will expire at midnight on 12/31/2028. Expiration shall occur by operation of law and shall not require notice, any decision document, or any environmental analysis or other documentation.

B. Minimum Use or Occupancy of the Permit Area. Use or occupancy of the permit area shall be exercised at least 365 days each year, unless otherwise authorized in writing under additional terms of this permit.

C. Notification to Authorized Officer. If the holder desires issuance of a new permit after expiration, the holder shall notify the authorized officer in writing not less than six (6) months prior to the expiration date of this permit.

D. Conditions for Issuance of a New Permit. At the expiration or termination of an existing permit, a new permit may be issued to the holder of the previous permit or to a new holder subject to the following conditions:

1. The authorized use is compatible with the land use allocation in the Forest Land and Resource Management Plan.
2. The permit area is being used for the purposes previously authorized.
3. The permit area is being operated and maintained in accordance with the provisions of the permit.
4. The holder has shown previous good faith compliance with the terms and conditions of all prior or other existing permits, and has not engaged in any activity or transaction contrary to Federal contracts, permits laws, or regulations.

E. Discretion of Forest Service. Notwithstanding any provisions of any prior or other permit, the authorized officer may prescribe new terms, conditions, and stipulations when a new permit is issued. The decision whether to issue a new permit to a holder or successor in interest is at the absolute discretion of the Forest Service.

F. Construction. Any construction authorized by this permit may commence by n/a and shall be completed by n/a. If construction is not completed within the prescribed time, this permit may be revoked or suspended.

III. RESPONSIBILITIES OF THE HOLDER

A. Compliance with Laws, Regulations, and other Legal Requirements. The holder shall comply with all applicable Federal, State, and local laws, regulations, and standards, including but not limited to, the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., the Resource Conservation and Recovery Act, 42 U.S.C. 6901 et seq., the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S. C. 9601 et seq., and other relevant environmental laws, as well as public health and safety laws and other laws relating to the siting, construction, operation, and maintenance of any facility, improvement, or equipment on the property.

B. Plans. Plans for development, layout, construction, reconstruction, or alteration of improvements on the permit area, as well as revisions of such plans, must be prepared by a qualified individual acceptable to the authorized officer and shall be approved in writing prior to commencement of work. The holder may be required to furnish as-built plans, maps, or surveys, or other similar information, upon completion of construction.

C. Maintenance. The holder shall maintain the improvements and permit area to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the authorized officer and consistent with other provisions of this authorization. If requested, the holder shall comply with inspection requirements deemed appropriate by the authorized officer.

D. Hazard Analysis. The holder has a continuing responsibility to identify all hazardous conditions on the permit area which would affect the improvements, resources, or pose a risk of injury to individuals. Any non-emergency actions to abate such hazards shall be performed after consultation with the authorized officer. In emergency situations, the holder shall notify the authorized officer of its actions as soon as possible, but not more than 48 hours, after such actions have been taken.

E. Change of Address. The holder shall immediately notify the authorized officer of a change in address.

F. Change in Ownership. This permit is not assignable and terminates upon change of ownership of the improvements or control of the business entity. The holder shall immediately notify the authorized officer when a change in ownership or control of business entity is pending. Notification by the present holder and potential owner shall be executed using Form SF-299 Application for Transportation and Utility Systems and Facilities of Federal Lands, or Form FS-2700-3a, Holder Initiated Revocation of Existing Authorization, Request for a Special Use Permit. Upon receipt of the proper documentation, the authorized officer may issue a permit to the party who acquires ownership of, or a controlling interest in, the improvements or business entity.

IV. LIABILITY

For purposes of this section, "holder" includes the holder's heirs, assigns, agents, employees, and contractors.

A. The holder assumes all risk of loss to the authorized improvements.

B. The holder shall indemnify, defend, and hold the United States harmless for any violations incurred under any such laws and regulations or for judgments, claims, or demands assessed against the United States in connection with the holder's use or occupancy of the property. The holder's indemnification of the United States shall include any loss by personal injury, loss of life or damage to property in connection with the occupancy or use of the property during the term of this permit. Indemnification shall include, but is not limited to, the value of resources damaged or destroyed; the costs of restoration, cleanup, or other mitigation; fire suppression or other types of abatement costs; third party claims and judgments; and all administrative, interest, and other legal costs. This paragraph shall survive the termination or revocation of this authorization, regardless of cause.

C. The holder has an affirmative duty to protect from damage the land, property, and interests of the United States.

D. In the event of any breach of the conditions of this authorization by the holder, the authorized officer may, on reasonable notice, cure the breach for the account at the expense of the holder. If the Forest Service at any time pays any sum of money or does any act which will require payment of money, or incurs any expense, including reasonable attorney's fees, in instituting, prosecuting, and/or defending any action or proceeding to enforce the United States rights hereunder, the sum or sums so paid by the United States, with all interests, costs and damages shall, at the election of the Forest Service, be deemed to be additional fees hereunder and shall be due from the holder to the Forest Service on the first day of the month following such election.

E. With respect to roads, the holder shall be proportionally liable for damages to all roads and trails of the United States open to public use caused by the holder's use to the same extent as provided above, except that liability shall not include reasonable and ordinary wear and tear.

F. The Forest Service has no duty to inspect the permit area or to warn of hazards and, if the Forest Service does inspect the permit area, it shall incur no additional duty or liability for identified or non-identified hazards. This covenant may be enforced by the United States in a court of competent jurisdiction.

V. TERMINATION, REVOCATION, AND SUSPENSION

A. General. For purposes of this permit, "termination", "revocation", and "suspension" refer to the cessation of uses and privileges under the permit.

"Termination" refers to the cessation of the permit under its own terms without the necessity for any decision or action by the authorized officer. Termination occurs automatically when, by the terms of the permit, a fixed or agreed upon condition, event, or time occurs. For example, the permit terminates at expiration. Terminations are not appealable.

"Revocation" refers to an action by the authorized officer to end the permit because of noncompliance with any of the prescribed terms, or for reasons in the public interest. Revocations are appealable.

"Suspension" refers to a revocation which is temporary and the privileges may be restored upon the occurrence of prescribed actions or conditions. Suspensions are appealable.

B. Revocation or Suspension. The Forest Service may suspend or revoke this permit in whole or part for:

1. Noncompliance with Federal, State, or local laws and regulations.
2. Noncompliance with the terms and conditions of this permit.
3. Reasons in the public interest.
4. Abandonment or other failure of the holder to otherwise exercise the privileges granted.

C. Opportunity to Take Corrective Action. Prior to revocation or suspension for cause pursuant to Section V (B), the authorized officer shall give the holder written notice of the grounds for each action and a reasonable time, not to exceed 90 days, to complete the corrective action prescribed by the authorized officer.

D. Removal of Improvements. Prior to abandonment of the improvements or within a reasonable time following revocation or termination of this authorization, the holder shall prepare, for approval by the authorized officer, an abandonment plan for the permit area. The abandonment plan shall address removal of improvements and restoration of the permit area and prescribed time frames for these actions. If the holder fails to remove the improvements or restore the site within the prescribed time period, they become the property of the United States and may be sold, destroyed or otherwise disposed of without any liability to the United States. However, the holder shall remain liable for all cost associated with their removal, including costs of sale and impoundment, cleanup, and restoration of the site.

VI. FEES

A. Termination for Nonpayment. This permit shall automatically terminate without the necessity of prior notice when land use rental fees are 90 calendar days from the due date in arrears.

B. The holder shall pay in advance a sum determined by the Forest Service to be the fair market value of the use granted by this authorization for a 5 year period. The payment is set at $352.50 for the initial 5 year period. Payments for each subsequent 5 year period shall be the amount of the payment for the initial period, adjusted using an appropriate indexing factor to reflect more nearly the current fair market value of the use at the beginning of the new period. At certain intervals the Forest Service shall review the fee and adjust the fee as necessary to assure that it is commensurate with the fair market value of the authorized rights and privileges, as determined by appraisal or other sound business management principles.

C. Payment Due Date. The payment due date shall be the close of business on January 1 of each calendar year payment is due. Payments in the form of a check, draft, or money order are payable to USDA, Forest Service. Payments shall be credited on the date received by the designated Forest Service collection officer or deposit location. If the due date for the fee or fee calculation statement falls on a non-workday, the charges shall not apply until the close of business on the next workday.

D. Late Payment Interest, Administrative Costs and Penalties Pursuant to 31 U.S.C. 3717, et seq., interest shall be charged on any fee amount not paid within 30 days from the date the fee or fee calculation financial statement specified in this authorization becomes due. The rate of interest assessed shall be the higher of the rate of the current value of funds to the U.S. Treasury (i.e., Treasury tax and loan account rate), as prescribed and published by the Secretary of the Treasury in the Federal Register and the Treasury Fiscal Requirements Manual Bulletins annually or quarterly or at the Prompt Payment Act rate. Interest on the principal shall accrue from the date the fee or fee calculation financial statement is due.

In the event the account becomes delinquent, administrative costs to cover processing and handling of the delinquency will be assessed.

A penalty of 6 percent per annum shall be assessed on the total amount delinquent in excess of 90 days and shall accrue from the same date on which interest charges begin to accrue.

Payments will be credited on the date received by the designated collection officer or deposit location. If the due date for the fee or fee calculation statement falls on a non-workday, the charges shall not apply until the close of business on the next workday.

Disputed fees are due and payable by the due date. No appeal of fees will be considered by the Forest Service without full payment of the disputed amount. Adjustments, if necessary, will be made in accordance with settlement terms or the appeal decision.

If the fees become delinquent, the Forest Service will:

Liquidate any security or collateral provided by the authorization.

If no security or collateral is provided, the authorization will terminate and the holder will be responsible for delinquent fees as well as any other costs of restoring the site to its original condition including hazardous waste cleanup.

Upon termination or revocation of the authorization, delinquent fees and other charges associated with the authorization will be subject to all rights and remedies afforded the United States pursuant to 31 U.S.C. 3711 *et seq.* Delinquencies may be subject to any or all of the following conditions:

Administrative offset of payments due the holder from the Forest Service.

Delinquencies in excess of 60 days shall be referred to United States Department of Treasury for appropriate collection action as provided by 31 U.S.C. 3711 (g), (1).

The Secretary of the Treasury may offset an amount due the debtor for any delinquency as provided by 31 U.S.C. 3720, *et seq.*)

VII. OTHER PROVISIONS

A. Members of Congress. No Member of or Delegate to Congress or Resident Commissioner shall benefit from this permit either directly or indirectly, except when the authorized use provides a general benefit to a corporation.

B. Appeals and Remedies. Any discretionary decisions or determinations by the authorized officer are subject to the appeal regulations at 36 CFR 251, Subpart C, or revisions thereto.

C. Superior Clauses. In the event of any conflict between any of the preceding printed clauses or any provision thereof and any of the following clauses or any provision thereof, the preceding printed clauses shall control.

D. Cultural Resources Protection (D001RO). The holder, contractor, or lessee shall be responsible for the protection from damage of all identified cultural resources within the area which may be affected by their actions. In addition, the holder, contractor, or lessee shall be liable for all damage or injury to the identified cultural resources caused by their actions. The holder, contractor, or lessee shall immediately notify the agency Project Administrator if any damage occurs to any cultural resource and immediately halt work in the area in which damage has occurred until approval to proceed has been granted by the Project Administrator after consultation with the Forest Archeologist. All provisions of the Region 3 Cultural Resources Damage Assessment Handbook are incorporated by reference herein.

E. Native American Grave Protection and Repatriation Act (X003RO). Pursuant to the Native American Grave Protection and Repatriation Act (NAGPRA) 25 USC 3002(d); 43 CFR Part 10.4, if any human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during the course of ground disturbing activity, the holder will immediately cease activity in the area of the discovery and will make a reasonable effort to protect the remains and objects. The holder will provide immediate telephone notification of the discovery to the Forest Service, and will follow up with written confirmation to the authorized officer. The holder will not resume the activity that resulted in the discovery until the authorized officer gives written approval. Approval to resume the activity, if otherwise lawful, will be given thirty (30) days after certification by the authorized officer of the holder's written confirmation of the discovery, or at any time that a written binding agreement is executed between the Forest Service and the affiliated tribes adopting a recovery plan for the remains and objects.

F. Superseded Authorization (X18). This authorization supersedes a special-use authorization designated: MOT95.

G. Signs (X29). Signs or advertising devices erected on National Forest System lands shall have prior approval by the Forest Service as to location, design, size, color, and message. Erected signs shall be maintained or renewed as necessary to neat and presentable standards, as determined by the Forest Service.

H. Improvement Relocation (X33). This authorization is granted with the express understanding that should future location of United States Government-owned improvements or road rights-of-way require the relocation of the holder's improvements, such relocation will be done by, and at the expense of, the holder within a reasonable time as specified by the authorized officer.

I. Water Rights (X74). This authorization does not convey any legal interest in water rights as defined by applicable State law.

This permit is accepted subject to the conditions set out above.

Date _____ *CORPORATE NAME

(CORPORATE SEAL)

By:_____
(Vice) President

ATTEST:_____

_____

_____
(Assistant) Secretary

The following certificate shall be executed by the Secretary or Assistant Secretary of the Corporation:

I_____certify that I am the _____ Secretary of the Corporation that executed the above permit; that _____who signed said permit on behalf of said Corporation was then _____ of said Corporation; that I know his/her signature on said permit is genuine; and that said permit was duly signed, sealed, and attested to for and on behalf of said Corporation by authority of its governing body

(CORPORATE SEAL)

_____.
(Assistant Secretary)

U. S. DEPARTMENT OF AGRICULTURE
Forest Service

By:_____
(Authorized Officer Signature)

Nancy Rose, Forest Supervisor
(Name and Title

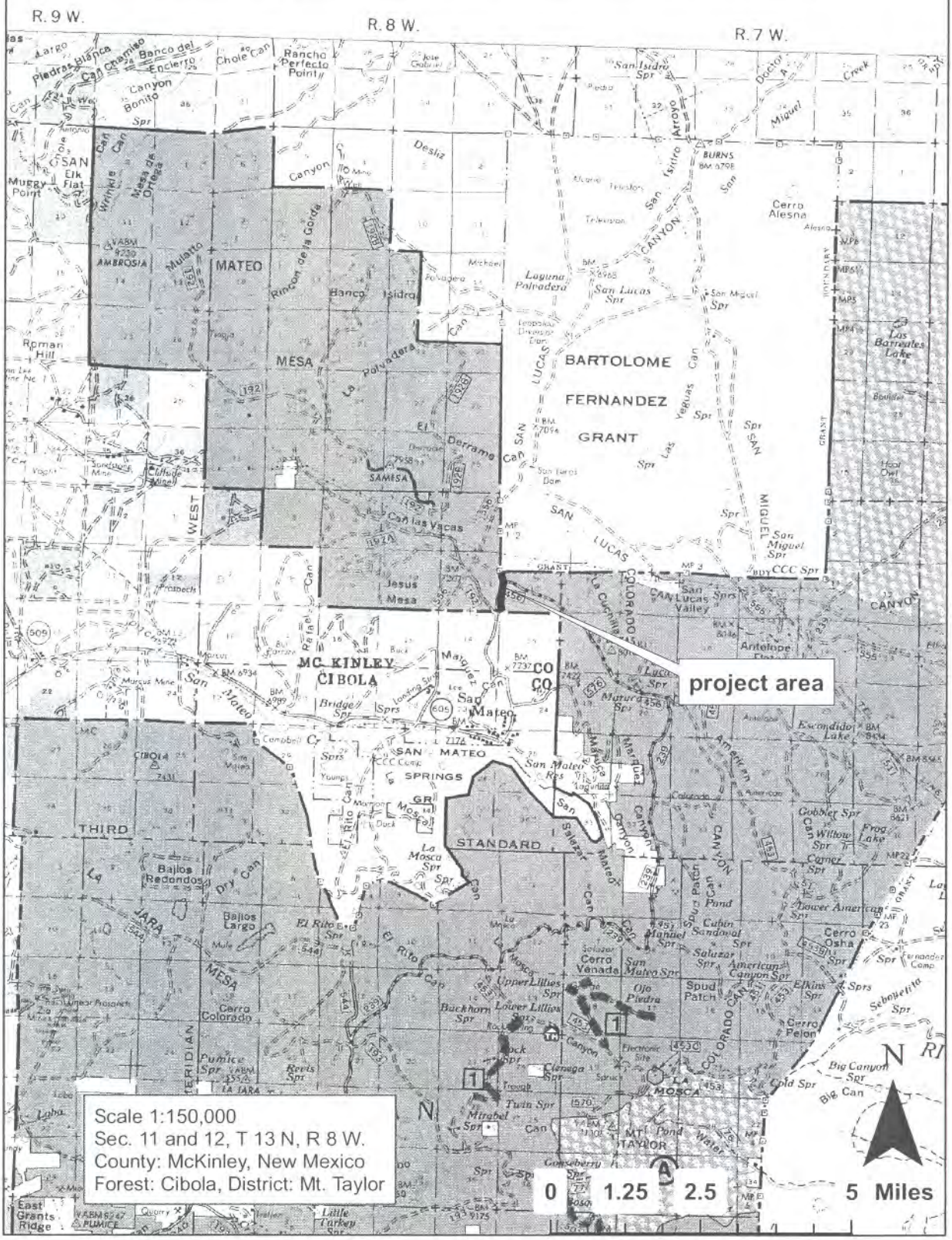
_____
(Date)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.

Figure 1.
Rio Grande Resources Pipeline



APPENDIX D

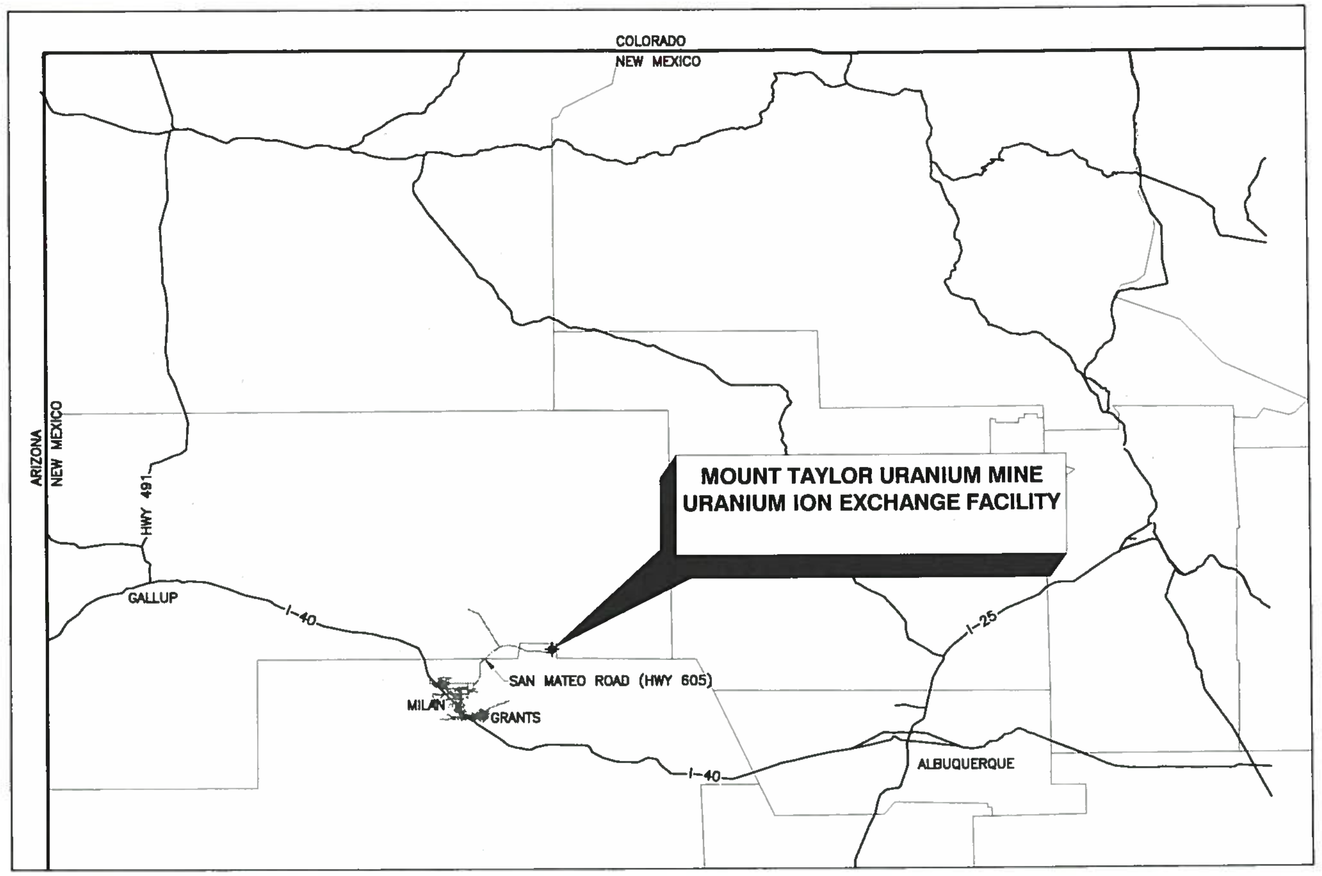
ION EXCHANGE PLANT DESIGN

- **Operation and Maintenance Manual**
- **Plans**

CIBOLA COUNTY, NEW MEXICO

MOUNT TAYLOR URANIUM MINE/RIO GRANDE RESOURCES CORP.

URANIUM ION EXCHANGE FACILITY

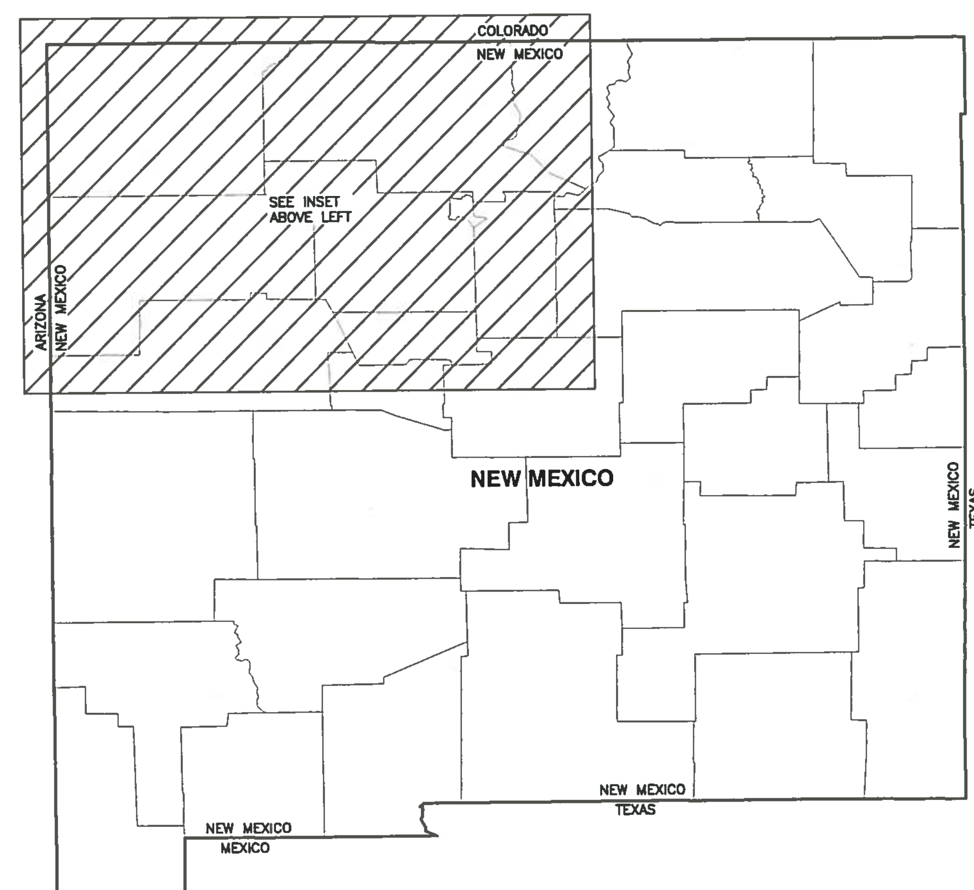


LOCATION MAP
NOT TO SCALE

N

SHEET INDEX

Sheet Number	Sheet Title
1	COVER SHEET
2	SYMBOLS & LEGEND (SHEET 1 OF 2)
3	SYMBOLS & LEGEND (SHEET 2 OF 2)
4	EQUIPMENT LAYOUT PLAN
5	FOUNDATION CONTAINMENT PLAN
6	MISCELLANEOUS DETAILS
7	PROCESS FLOW DIAGRAM
8	P&ID-MINE WATER WET WELL
9	P&ID-ION EXCHANGE COLUMNS (TRAINS 1 & 2)
10	P&ID-RESIN STORAGE AND TRANSFER



LNV
engineers | architects | contractors
801 NAVIGATION, SUITE 300
CORPUS CHRISTI, TEXAS 78408
TBPE FIRM NO. F-366
PH. (361) 883-1984
FAX (361) 883-1986
WWW.LNVINC.COM

DAN S. LEYENDECKER, NEW MEXICO, 18550, PROFESSIONAL ENGINEER
3/28/13

REVISION BLOCK — DATE | NO. | DESCRIPTION | BY

DRAWN BY: DWH
CHECKED BY: WLB
APPROVED BY: DSL
SCALE: SHOWN
MARCH 2013

MT. TAYLOR URANIUM MINE/RIO GRANDE RESOURCES CORP., NEW MEXICO
URANIUM ION EXCHANGE FACILITY

COVER SHEET

1 / 10
JOB NO. 130040
FILE NO. COVER SHEET
SHEET NO. 1 OF 10

FUNCTION SYMBOLS:

	CONTROL ROOM CONSOLES	FIELD MOUNTED	AUXILLIARY CONTROL PANEL NORMALLY ACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS	○	○	○
DCS	▭	▭	▭
COMPUTER FUNCTION	⬡	⬡	⬡
PLC	⊠	⊠	⊠

LINE SYMBOLS:

- FLOW LINE
- CONTROL LINE (ELECTRICAL)
- HARDWIRE
- DATA COMMUNICATIONS RS485, RS422 BETWEEN PLC AND DCS
- PID CONTROL LOOP
- AIR SUPPLY
- INTERLOCK
- SVH — SET VALUE HIGH (DCS) FOR VFD.
- SVL — SET VALUE LOW (DCS) FOR VFD.
- MV — MANIPULATED VARIABLE FOR VFD.
- PV — PROCESS VARIABLE FOR VFD.

LINE CONTINUATION ARROWS:

- TO/FROM ADJACENT DRAWING
- DWG. NUMBER — TO/FROM NON-ADJACENT DRAWING

ABBREVIATIONS

FRP	FIBERGLASS REINFORCED STEEL
RLS	RUBBER LINED STEEL
SS	STAINLESS STEEL
STEEL	CARBON STEEL
LPB	(PVC) POLYVINYL CHLORIDE
RO	RESIN IN
RI	RESIN OUT
MW	MINE WATER
RTW	RESIN TRANSFER WATER

MECHANICAL SYMBOLS:

- PUMP
- REDUCER
- FLANGE JOINT
- CAMLOCK FITTING
- FILTER
- FLEXIBLE JOINT
- VENTS
- AGITATOR (AG)
- MANHOLE
- PULSE DAMPENER
- RECEIVER (R)
- RADIOACTIVE SOURCE (S)
- EDUCTOR
- FLEXIBLE HOSE
- SONIC LEVEL SENSOR
- VERTICAL TURBINE PUMP

MISCELLANEOUS SYMBOLS:

- MAG METER (M)
- MOTOR ACTUATED VALVE WITH MANUAL HANDWHEEL (M)
- BAG FILTER

VALVE SYMBOLS:

- VXXX — VALVE – GENERAL
- VXXX — VALVE – NORMALLY CLOSED
- VXXX — BALL VALVE
- VXXX — BUTTERFLY VALVE
- VXXX — DIAPHRAGM VALVE MANUALLY OPERATED
- VXXX — PRESSURE RELIEF VALVE SPRING OPERATED
- VXXX — PRESSURE REDUCING VALVE OPERATED BY DOWNSTREAM PRESSURE — FLOW DIRECTION
- VXXX — BACK PRESSURE VALVE OPERATED BY UPSTREAM PRESSURE — FLOW DIRECTION
- VXXX — CHECK VALVE
- KNIFE GATE VALVE
- VXXX — HAND VALVE MANUALLY OPERATED
- VXXX — CONTROL VALVE – FLOW MODULATING 4-20mA /PNEUMATIC OPERATED MANUAL OVER-RIDE VXXX
- STRAINER

VALVE NOMENCLATURE

VXXX
- VALVE ID
- TRAIN (IF APPLICABLE)
- PROCESS
- VALVE

PROCESS
- 0 MINE WATER
- 1 ION EXCHANGE
- 2 RESIN OUT
- 3 RESIN IN
- 4 RESIN TRANSFER WATER

3/28/13

STATE OF NEW MEXICO — LEYENDECKER — 18550 — PROFESSIONAL ENGINEER

BY	DESCRIPTION	NO	DATE
	*** REVISION BLOCK ***		

DAN LEYENDECKER P.E. NO. 18550

DRAWN BY: DWH
CHECKED BY: WLB
APPROVED BY: DSL
SCALE: SHOWN
MARCH 2013

MT. TAYLOR URANIUM MINE/RIO GRANDE RESOURCES CORP., NEW MEXICO
URANIUM ION EXCHANGE FACILITY
SYMBOLS & LEGEND
(SHEET 1 OF 2)

LNV engineers | architects | contractors
831 NAVIGATION, SUITE 300
CORPUS CHRISTI, TEXAS 78408
TBPE FIRM NO. F-545
PH: (361) 883-1984
FAX: (361) 883-1988
WWW.LNVINC.COM

JOB NO.	130040
DWG NO.	SYMBOLS
SHEET NO.	2 OF 10

2 / 10

P&ID SYMBOLS; FIELD INSTRUMENTS

XX = EQUIPMENT ID

MW	MINE WATER
IX-(1-14)	ION EXCHANGE COLUMN (1-14)
RI	RESIN IN
RO	RESIN OUT
T-1	OVERFLOW TANK
T-2A	RESIN TRANSFER WATER STORAGE TANK
T-2B	RESIN TRANSFER WATER STORAGE TANK
T-3A	LOADED RESIN STORAGE TANK
T-3B	LOADED RESIN STORAGE TANK
SP-1	SUMP PUMP

LI XX	LEVEL INDICATOR
FI XX	FLOW INDICATOR
LT XX	LEVEL TRANSMITTER
FT XX	FLOW TRANSMITTER
LV XX	LEVEL VALVE
FCV XX	FLOW CONTROL VALVE
LIT XX	LEVEL INDICATOR TRANSMITTER
FIT XX	FLOW INDICATOR TRANSMITTER
LS XX	LEVEL SWITCH
LSH XX	LEVEL SWITCH HIGH
LSL XX	LEVEL SWITCH LOW
LSHL XX	LEVEL SWITCH HIGH LOW
LCV XX	LEVEL CONTROL VALVE
FE XX	FLOW SENSOR ELEMENT
LE XX	LEVEL SENSOR ELEMENT
VFD XX	VARIABLE FREQUENCY DRIVE

LAHH XX	LEVEL ALARM HIGH HIGH by DCS
LAH XX	LEVEL ALARM HIGH by DCS
LAL XX	LEVEL ALARM LOW by DCS
LALL XX	LEVEL ALARM LOW LOW by DCS
FAL XX	FLOW ALARM LOW by DCS
FAH XX	FLOW ALARM HIGH by DCS
LIC XX	LEVEL INDICATOR CONTROL by DCS
FIC XX	FLOW INDICATOR CONTROL by DCS
FR XX	FLOW RECORDER by DCS

3/28/13

DAN S. LEYENDECKER, P.E. NO. 18550
NEW MEXICO 18550 PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY
1		REVISION BLOCK ...	
2			
3			
4			

DRAWN BY: DWH
CHECKED BY: MLB
APPROVED BY: DSL
SCALE: SHOWN
MARCH 2013

MT. TAYLOR URANIUM MINE/RIO GRANDE RESOURCES CORP., NEW MEXICO
URANIUM ION EXCHANGE FACILITY

SYMBOLS & LEGEND
(SHEET 2 OF 2)

LNV engineers | architects | contractors
801 NAVIGATION, SUITE 300
CORPUS CHRISTI, TEXAS 78408
TBPE FIRM NO. F-349
PH. (361) 883-1984
FAX (361) 883-1988
WWW.LNVINC.COM

JOB NO.	3 / 10
	1300-10
TAB NO.	LEGEND
SHEET NO.	3 OF 10

EQUIPMENT SUMMARY				
TAG	DESCRIPTION	SIZE	CAPACITY	
IX-(1-8)	EXISTING IX COLUMNS WITH MODIFICATIONS	12'ø x 12'H	10,000 GAL	
IX-(9-14)	PROPOSED IX COLUMNS	12'ø x 12'H	10,000 GAL	
T-1	OVERFLOW TANK	26'ø x 24'H	95,000 GAL	
T-2A	RESIN TRANSFER WATER STORAGE TANK	12'ø x 20'H	16,000 GAL	
T-2B	RESIN TRANSFER WATER STORAGE TANK	12'ø x 20'H	16,000 GAL	
T-3A	LOADED RESIN STORAGE TANK	8'ø x 20'H	7,500 GAL	1,000 CF
T-3B	LOADED RESIN STORAGE TANK	8'ø x 20'H	7,500 GAL	1,000 CF
SP-1	SUMP AND GRATE	6'ø x 5' DEEP	1,000 GAL	
P-2	RESIN TRANSFER WATER PUMP	TBD		
F-(1-3)	FILTER	TBD		
RT	RESIN TANKER			1,500 CF

LEGEND

- EXIST ELEVATED PLATFORM
- EXIST 24" MANIFOLD (UPPER LEVEL)
- EXIST 24" MANIFOLD (LOWER LEVEL)
- PIPE — EXIST PIPE
- EXIST REDUCER
- EXIST VALVE

PLANT NORTH

N

SCALE
1"=5' (FULL SIZE)
1"=10' (HALF SIZE)

M.C.C. ROOM
(MOTOR CONTROL CENTER)
(19'x16')

SHOWER
(5'x7')

RESTROOM
(10'x7')

CONTROL ROOM
(15'x8')

T-1
OVERFLOW TANK

T-2A
RESIN
TRANSFER
WATER TANK

T-2B
RESIN
TRANSFER
WATER TANK

T-3A
LOADED RESIN
TANK

T-3B
LOADED RESIN
TANK

F-3
F-2
F-1

P-2

RT

SP-1

EXISTING TANK SUPPORT FOOTING (TYP)

EXISTING STAIRS

IX-1 IX-2 IX-3 IX-4 IX-5 IX-6 IX-7 IX-8 IX-9 IX-10 IX-11 IX-12 IX-13 IX-14

PIPE

PROPOSED TANK SUPPORT FOOTING (TYP)

EXISTING STAIRS

MINE WATER SUMP

25.00' 18.00' 11.00' 11.00' 6.00'

14.17'

8.75'

70.00' OVERALL

18.00' TYPICAL

12.59'

12.00'

20.00' TYPICAL FOR TRAINS 1-4

144.00' OVERALL

19.75' TYPICAL FOR TRAINS 5-7

8.33'

1 PROPOSED EQUIPMENT LAYOUT PLAN
SCALE: 1"=10' (HALF SIZE SHEETS)
SCALE: 1"=5' (FULL SIZE SHEETS)

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URANIUM ION EXCHANGE FACILITY

EQUIPMENT LAYOUT PLAN

LNV engineers | architects | contractors
801 NAVIGATION, SUITE 390
CORPUS CHRISTI, TEXAS 78408
TBPE FIRM NO: F-566
PH: (361) 883-1984
FAX: (361) 883-1985
WWW.LNVINC.COM

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TAB NO	PROP. EQUIP.
SHEET NO	4 OF 10

LEGEND

EXISTING TRENCH DRAIN

FF	INDICATES FINISH FLOOR ELEVATION
FL	INDICATES FLOWLINE ELEVATION
EL	INDICATES ELEVATION
TW	INDICATES TOP OF WALL ELEVATION
TOC	INDICATES TOP OF CONCRETE ELEVATION
TG	INDICATES TOP OF GRATE ELEVATION

PLANT NORTH

N

SCALE
1"=5' (FULL SIZE)
1"=10' (HALF SIZE)

3/28/13

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NEW MEXICO
13550
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M.C.C. ROOM
(MOTOR CONTROL CENTER)
(19'x16')
FF=7293.60

SHOWER (5'x7')
RESTROOM (10'x7')
CONTROL ROOM
(15'x8')
FF=7293.60

CONTAINMENT CURB
CONTAINMENT CURB RAMP
EXISTING STAIRS
GRADE BREAK
SLOPE
RAISED CURBING @ EXTERIOR WALLS & COLUMNS
6" DRAIN PIPE
EL=7293.35 TYP @ TRENCH EDGES

TW=7294.47 FF=7293.60
FF=7293.60
14.17'
TOC=7291.35
T-1
OVERFLOW TANK
P-1
FF=7289.85
FF=7289.52
TW=7294.10 FF=7293.47

25.00' 18.00' 11.00' 11.00' 6.00'
TW=7294.47 FF=7289.85
F-3
F-2
F-1
P-2
T-2A
T-2B
T-3A
T-3B
8.75'
TG=7289.35
SP-1
TW=7293.60 FF=7289.85
70.00' OVERALL
18.00' TYPICAL
12.59'

IX-1 IX-2 IX-3 IX-4 IX-5 IX-6 IX-7 IX-8
IX-9 IX-10 IX-11 IX-12 IX-13 IX-14

TG=7293.35 FL=7292.78
30.67 LF TRENCH @ 0.50%
TG=7293.35 FL=7292.63
12.99 LF TRENCH @ 0.50%
TG=7293.35 FL=7292.69
55.75 LF TRENCH @ 0.50%
TG=7293.35 FL=7292.35

TW=7294.47 FF=7293.60
TW=7294.10 FF=7293.47
TW=7294.47 FF=7289.85
TW=7293.60 FF=7289.85

12.00'
20.00' TYPICAL FOR TRAINS 1-4
144.00' OVERALL
19.75' TYPICAL FOR TRAINS 5-7
8.33'

1 FOUNDATION CONTAINMENT PLAN
SCALE: 1"=10' (HALF SIZE SHEETS)
SCALE: 1"=5' (FULL SIZE SHEETS)

MT. TAYLOR URANIUM MINE/RIO GRANDE RESOURCES CORP., NEW MEXICO
URANIUM ION EXCHANGE FACILITY

FOUNDATION CONTAINMENT PLAN

LNV engineers | architects | contractors
801 NAVIGATION, SUITE 300
CORPUS CHRISTI, TEXAS 78408
TBPE FIRM NO. F-349
PH. (361) 883-1984
FAX (361) 883-1988
WWW.LNVINC.COM

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TAB NO.	PROP. EQUIP.
SHEET NO.	5 OF 10

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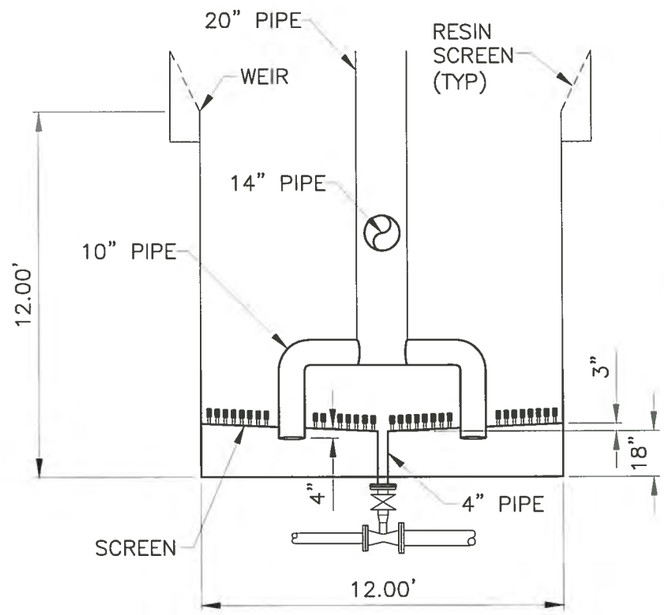

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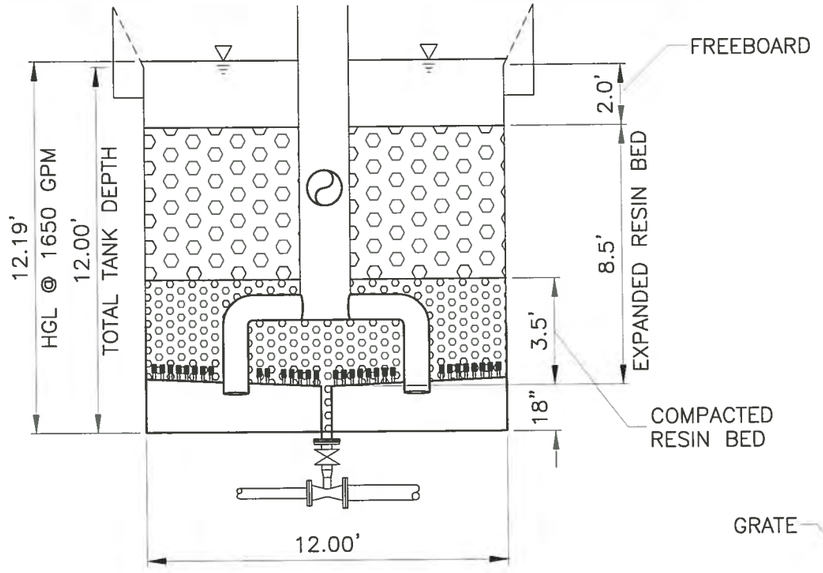
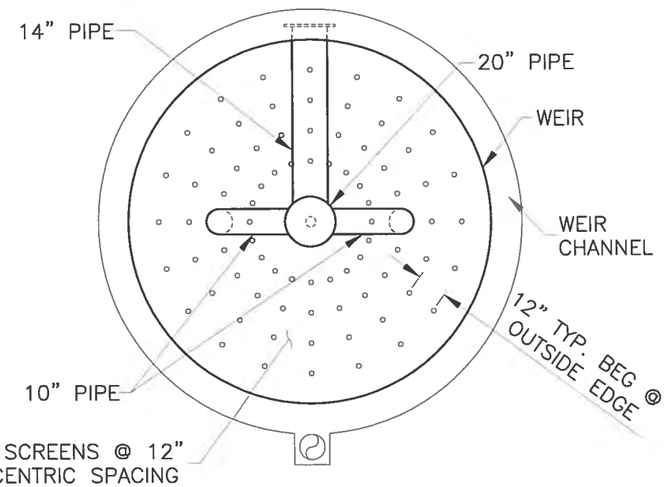
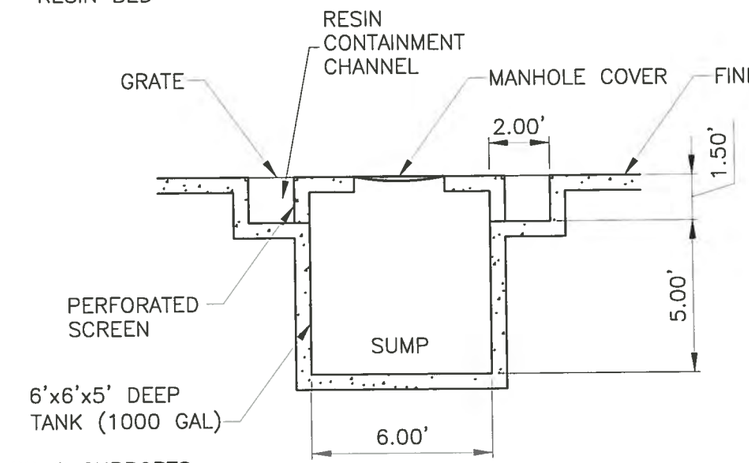


2 RESIN & HYDRAULIC PROFILE
SCALE: 1"=5' (HALF SIZE)



PLAN

1 IX COLUMN
SCALE: 1"=5' (HALF SIZE)



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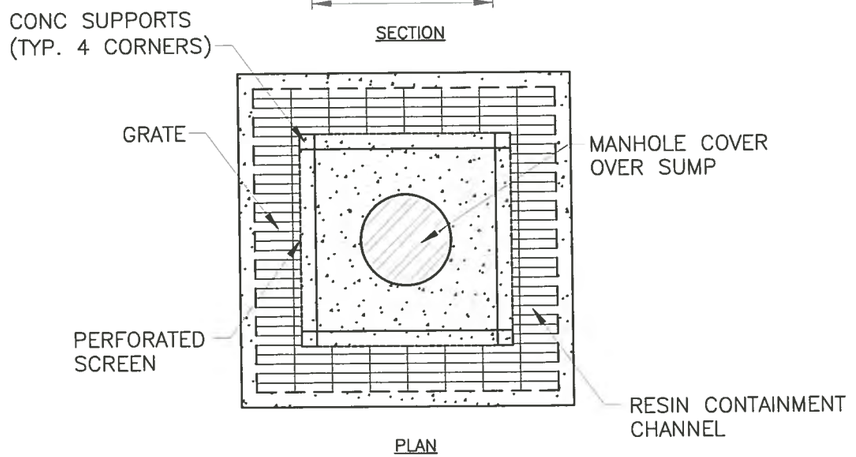

PLAN

3 SUMP DETAIL
SCALE: 1"=5' (HALF SIZE)

DAN S. LEYENDECKER NEW MEXICO 13550 PROFESSIONAL ENGINEER

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MISCELLANEOUS DETAILS

LNV engineers | architects | contractors
831 NAVIGATION, SUITE 390
CORPUS CHRISTI, TEXAS 78408
TBPE FIRM NO: F-266
PH: (361) 883-1984
FAX: (361) 883-1988
WWW.LNVINC.COM

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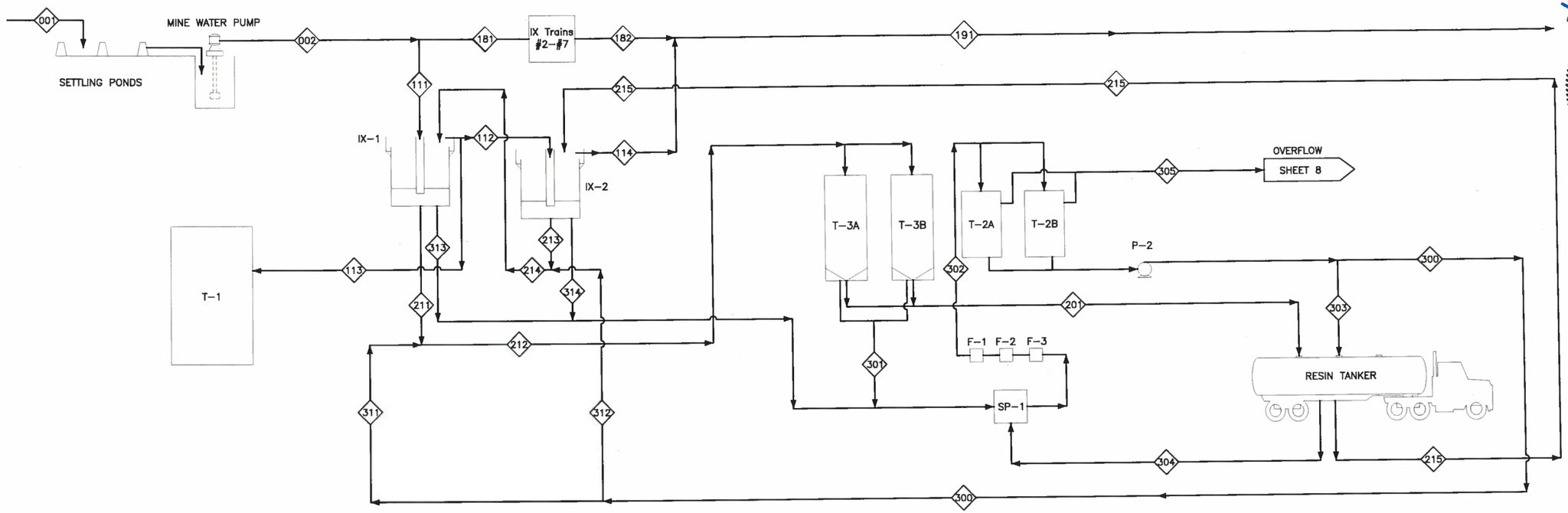
SHEET NO. 6 OF 10



XXX
- STREAM ID / TRAIN # / PROCESS
- 8=TRAINS 2–7 COMBINED
- 0=ALL TRAINS COMBINED

PROCESS
- 0 MINE WATER
- 1 ION EXCHANGE
- 2 RESIN TRANSFER
- 3 RESIN TRANSFER WATER

NOTES:
1. LEAD AND TAIL IX COLUMNS OF TRAIN NUMBER (1) OF SEVEN (7) SHOWN
2. NEW RESIN TRANSFER LINE 4" @ 5 FPS THEREFORE WATER FLOW @ 200 GPM.

1 PROCESS FLOW DIAGRAM
NOT TO SCALE

FLOW AND MASS BALANCE

PROCESS			ION EXCHANGE									RESIN TRANSFER						RESIN TRANSFER WATER									
STREAM NO.			001	002	111	112	113	114	181	182	191	201	211	212	213	214	215	300	301	302	303	304	305	311	312	313	314
DESCRIPTION			RAW MINE WATER	SETTLED MINE WATER	TRAIN #1 LEAD COLUMN FEED	TRAIN #1 LEAD COLUMN DISCHARGE / TAIL COLUMN FEED	OVERFLOW	TRAIN #1 TAIL COLUMN TREATED WATER	IX TRAINS #2 - #7 FEED	IX TRAINS #2 - #7 TREATED WATER	TRAINS #1-#7 TREATED WATER	LOADED RESIN TO RESIN TANKER	TRAIN #1 LEAD COLUMN LOADED RESIN	LOADED RESIN AND RTW	TRAIN #1 TAIL COLUMN PARTIALLY LOADED RESIN	PARTIALLY LOADED RESIN AND RTW	STRIPPED RESIN	RTW TO EDUCTOR OF LEAD OR TAIL IX COLUMN	LOADED RESIN STORAGE TANK RTW RETURN	FILTERED WATER BACK TO RTW STORAGE TANK	RESIN TRANSFER WATER TO RESIN TANKER	RESIN TANKER WATER TO SUMP	RESIN TRANSFER WATER STORAGE TANK OVERFLOW	RTW TO EDUCTOR OF LEAD COLUMN	RTW TO EDUCTOR OF TAIL COLUMN	TRAIN #1 LEAD COLUMN RTW RETURN	TRAIN #1 TAIL COLUMN RTW RETURN
ION EXCHANGE	Q_{IX}	(gpm)	10,000	10,000	1,429	1,429	-	1,429	8,571	8,571	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Q_{IX}	(ft^3/min)	1,337	1,337	191	191	-	191	1,146	1,146	1,337	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SOLIDS	(mg/L)	1,000	100	100	100	-	100	100	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SOLIDS	(Tons/h)	2.5	0.25	0.04	0.04	-	0.04	0.21	0.21	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTALS	TRANSFER TIME	(min)	-	-	-	-	-	-	-	-	-	120	120	120	120	120	120	120	120	120	120	120	-	120	120	120	120
	SP.GR.	LIQUOR	1	1	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	1	1
	U_3O_8	(mg/l)	0.1	0.1	0.1	0.020	-	0.017	0.1	0.017	0.017	0.3	961	0.3	35	0	-	-	-	-	-	-	-	-	-	-	-	-
	U_3O_8	(lbs/day)	12	12	1.7	0.34	-	0.29	10.3	1.8	2.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	U_3O_8	(lbs/ft^3)	0	0	0	0	-	0	0	0	0	0	0.06	0	0.002	0	-	-	-	-	-	-	-	-	-	-	-	-
	Q_{TOTAL}	(gpm)	10,000	10,000	1,429	1,429	-	1,429	8,571	8,571	10,000	225	25	225	25	225	225	225	200	200	200	200	200	-	200	200	200	200
	Water	(Tons/h)	2,502	2,502	357	357	-	357	2,145	2,145	2,502	56	6	56	6	56	56	50	50	50	50	50	-	50	50	50	50
	TOTAL	(Tons/h)	2,505	2,503	358	358	-	358	2,145	2,145	2,503	56	6	56	6	56	56	50	50	50	50	50	-	50	50	50	50
RESIN TRANSFER	Q_{RESIN}	(gpm)	-	-	-	-	-	-	-	-	-	25	25	25	25	25	25	-	-	-	-	-	-	-	-	-	-
	Q_{RESIN}	(ft^3/min)	-	-	-	-	-	-	-	-	-	3.3	3.3	3.3	3.3	3.3	3.3	-	-	-	-	-	-	-	-	-	-
	V_{RESIN}	(ft^3)	-	-	-	-	-	-	-	-	-	400	400	400	400	400	400	-	-	-	-	-	-	-	-	-	-
RESIN TRANSFER WATER	Q_{RTW}	(gpm)	-	-	-	-	-	-	-	-	-	200	-	200	-	200	200	200.0	200.0	200.0	200	200	-	200.0	200.0	200.0	200.0
	Q_{RTW}	(ft^3/min)	-	-	-	-	-	-	-	-	-	27	-	27	-	27	27	27	27	27	27	27	-	27	27	27	27

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URANIUM ION EXCHANGE FACILITY

PROCESS FLOW DIAGRAM

LNV engineers | architects | contractors
PH: (361) 883-1984
FAX: (361) 883-1988
WWW.LNVINC.COM
841 NAVIGATION, SUITE 300
CORPUS CHRISTI, TEXAS 78408
TBPE FIRM NO. F-266

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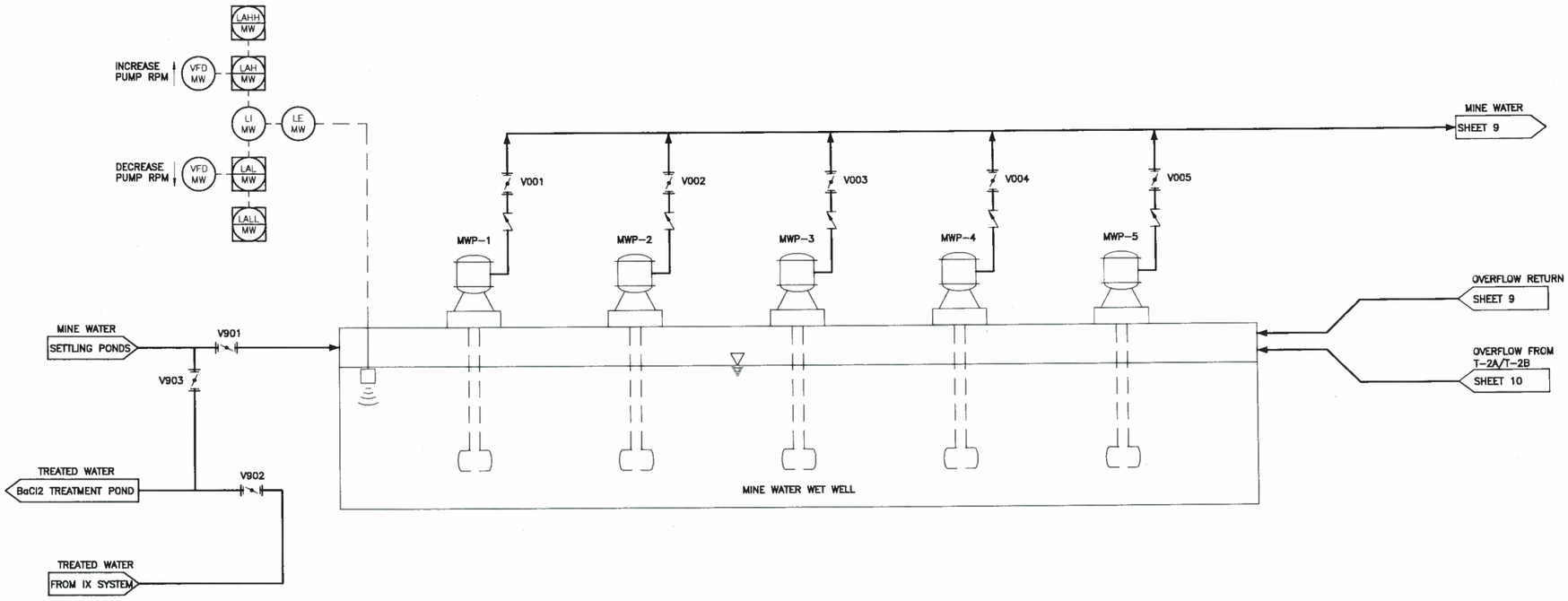
SHEET NO. 7 OF 10



MWP-1 MWP-2 MWP-3 MWP-4 MWP-5

MINE WATER TRANSFER PUMPS

GPM 2500 @ 40 HEAD
MOTOR HP: 40
MATERIAL: CAST STEEL, BRONZE TRIM

MINE WATER WET WELL

SIZE: 30'x6'x8'
CAPACITY: 10,800 GALLONS

DAN S. LEYENDECKER, P.E. NO. 18550
NEW MEXICO 18550 PROFESSIONAL ENGINEER
3/29/13

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URANIUM ION EXCHANGE FACILITY

P&ID-MINE WATER WET WELL

LNV engineers | architects | contractors
811 NAVIGATION, SUITE 300
CORPUS CHRISTI, TEXAS 78408
PH: (361) 883-1984
FAX: (361) 883-1988
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JOB NO:	130040
TAB NO.	MW PID
SHEET NO.	8 OF 10

** LEAD AND TAIL IX COLUMNS OF TRAINS ONE (1) AND TWO (2) OF SEVEN (7) SHOWN

IX–1
LEAD COLUMN
TRAIN #1

IX–2
TAIL COLUMN
TRAIN #1

IX–3
LEAD COLUMN
TRAIN #2

IX–4
TAIL COLUMN
TRAIN #2

MINE WATER
SHEET 8

MINE WATER
TRAINS 3–7 **

FAL MW
FR MW
FIT MW
M–MW
V110
FAH 1
FIC 1
FIT 1
M–1
FR 1
FCV 1
V113
V112
FCV 1
V111
LAHH 1
LAH 1
LIC 1
FCV 1
LIT 1
LCV 2
LAHH 2
LAH 2
LIC 2
LIT 2
TO OVERFLOW TANK (T–1)
FAH 3
FIC 3
FIT 3
FR 3
FCV 3
V120
M–3
V123
V122
V121
LAHH 3
LAH 3
LIC 3
LIT 3
FISH TAIL BFV SET TO OPEN 10%
LCV 4
LAHH 4
LAH 4
LIC 4
LIT 4
LIC T–1
LIT T–1
T–1 OVERFLOW TANK
V211
V212
V221
V222
V311
V312
V321
V322
RESIN TRANSFER WATER
SHEET 10
TREATED WATER
FROM IX SYSTEM
RESIN TRANSFER WATER
TRAINS 3–7 **
LOADED RESIN
SHEET 10
STRIPPED RESIN
SHEET 9
OVERFLOW RETURN
SHEET 8

DANS. LEYENDECKER
NEW MEXICO
18350
PROFESSIONAL ENGINEER
3/28/13

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		2	
		3	

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URANIUM ION EXCHANGE FACILITY

P&ID–ION EXCHANGE COLUMNS (TRAINS 1 & 2)

LNV engineers | architects | contractors
681 NAVIGATION, SUITE 300
CORPUS CHRISTI, TEXAS 78408
TBPE FIRM NO. F-388
PH. (361) 883-1984
FAX (361) 883-1988
WWW.LNVINC.COM

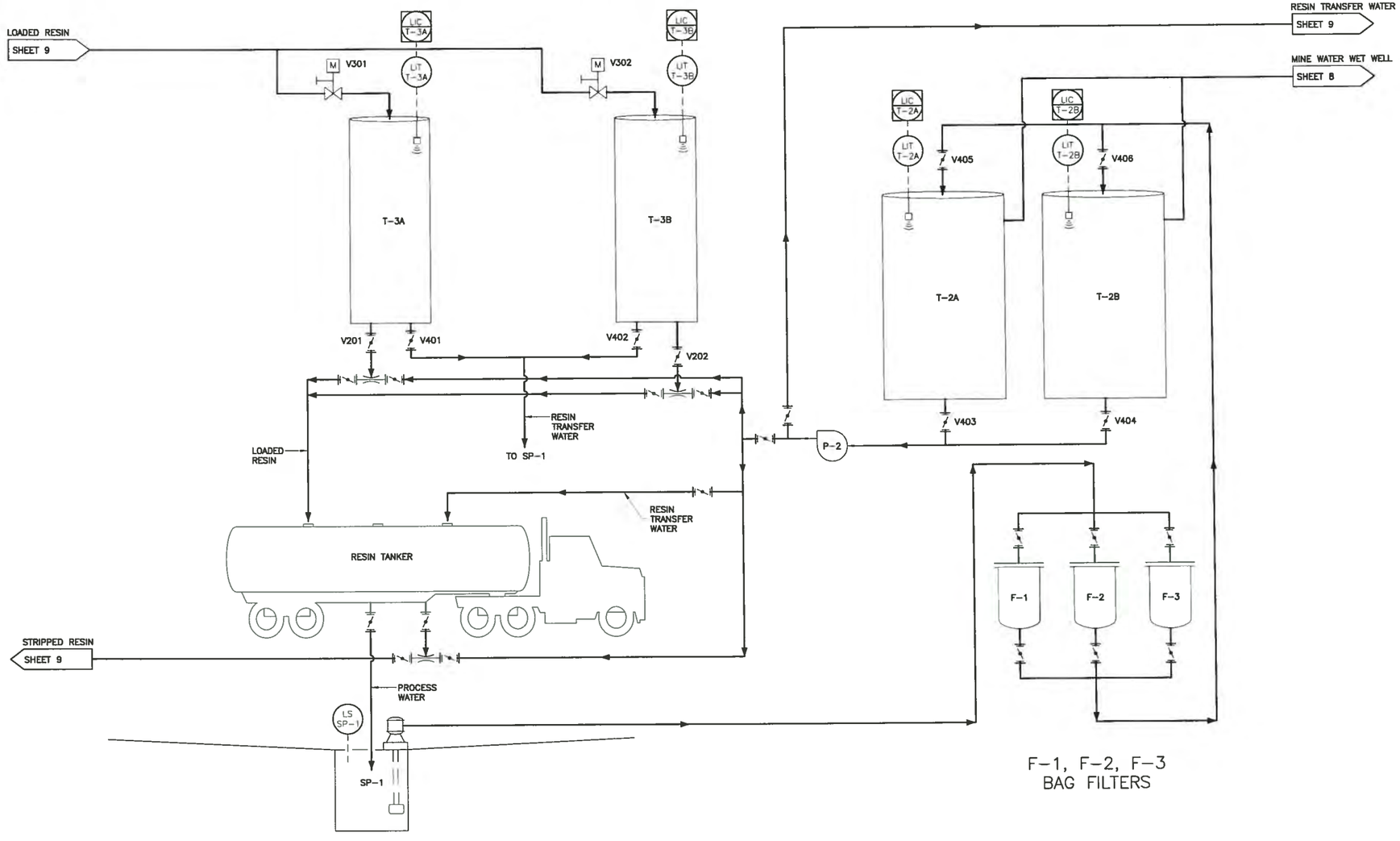
SHEET NO.	9
TOTAL SHEETS	10
JOB NO.	130010
FILE NO.	IX PID
DRAWING NO.	9 OF 10

T–3A
LOADED RESIN
STORAGE TANK
(8'ø x 20'H)

T–3B
LOADED RESIN
STORAGE TANK
(8'ø x 20'H)

T–2A
RESIN TRANSFER
WATER STORAGE
TANK
(12'ø x 20'H)

T–2B
RESIN TRANSFER
WATER STORAGE
TANK
(12'ø x 20'H)



F–1, F–2, F–3
BAG FILTERS

3/28/13
DAN S. LEYENDECKER
NEW MEXICO
13350
PROFESSIONAL ENGINEER

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Δ			
Δ			

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URANIUM ION EXCHANGE FACILITY

P&ID–RESIN STORAGE AND TRANSFER

LNV engineers | architects | contractors
801 NAVIGATION, SUITE 360
CORPUS CHRISTI, TEXAS 78408
TBPE FIRM NO. F-388
PH. (361) 883-1984
FAX (361) 883-1988
WWW.LNVINC.COM

	10 / 10
JOB NO.	130040
DWG NO.	RS PID
SHEET NO.	100F 10

Operations & Maintenance Manual

Mt. Taylor Mine
Mine Water Treatment Unit (MWTU) - IX Facility

LNV Project No. 130040

RIO GRANDE RESOURCES CORPORATION

P.O. Box 1000
Hobson, TX 78117

Prepared by:

LNV
engineers | architects | contractors

Phone: (361) 883-1984
Fax: (361) 883-1986
801 Navigation, Suite 300
Corpus Christi, Texas 78408

3/28/13
DAN S. LEYENDECKER
NEW MEXICO
18550
PROFESSIONAL ENGINEER

March 28, 2013

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B. Ion Exchange 3

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IV. Plant Operation 4

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D. Instrumentation 7

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Appendix A – Resin Spec Sheet

MT. TAYLOR URANIUM IX PLANT OPERATING MANUAL

I. Background Information

Rio Grande Resources (RGR) plans to re-open the Mt. Taylor uranium mine located outside of Grants, New Mexico. The existing mine has to be dewatered to enable access to the ore. To dewater the existing mine works and operate the mine in the future, an extensive water management system must be run in combination with a Mine Water Treatment Unit (MWTU) to remove uranium (U) from the mine water to enable discharge to an NPDES-permitted outfall north of the mine.

The water treatment will be operated in two main phases:

Phase 1 - Mine de-watering phase:

- Flow 8,000 -10,000 gallons per minute (gpm)
- U 0.07 parts per million (ppm) trend increasing
- TDS ~ 400 (ppm)

Phase 2 - Mine operation:

- Flow 4,000 -5,000 gpm
- U about 1 ppm (previous mining conditions, late phase)
- TDS 800 ppm

Discharge requirements:

- 30 parts per billion (ppb) U (human health standard in 20.6.2.3103.A(12)NMAC)

RGR considers U removal by ion exchange (IX) using the existing IX plant at the site as the primary option. IX loaded resin will be transferred to an off-site facility, duly licensed by the Nuclear Regulatory Commission (NRC) or an Agreement State, to be regenerated. The stripped resin will then be returned for reuse at the IX Plant.

RGR has put together a uranium removal system utilizing a proven IX process to meet the drinking water standard discharge requirements. The system will incorporate IX trains each consisting of two IX columns in series. Each IX column will have a load capacity of 400 cubic feet (ft^3) of IX resin with a maximum loading capacity of 0.09 pounds of U per cubic foot of resin. Each train has been designed to handle a maximum flow rate of 1,650 gpm and will be operated at a nominal flow rate of 1,429 gpm. The individual trains will be sampled and assayed to insure that the discharge water will not exceed the discharge limits for uranium of 30 ppb. The IX columns are designed to transfer the resin in the lead IX column when it reaches a loading of about 0.06 pounds of U per cubic foot, to prevent discharge exceeding 30 ppb U. The loaded resin from the lead IX column will be transferred to one of two loaded resin storage tanks and then will be off loaded to a resin tanker. The resin tanker will transport the loaded resin to an off-site facility for regeneration.

Each of the IX columns will be operated in an up flow mode with safeguards to prevent resin leakage between IX columns or resin spills. Each of the IX columns will have safety devices to prevent resin spills as follows: 1) resin screens in the overflow of each column, 2) a level control system that will reduce the input flow rate to the lead IX column; and 3) a bypass on the tail column to reroute bypass fluid to an overflow storage tank. The fluid sent to the overflow storage tank will be recycled back to the main supply wet well where it will be fed to the lead IX column.

II. Plant Function

The Mt. Taylor IX Plant is designed to treat 10,000 gpm of mine water for removal of uranium. The ion exchange process for recovering uranium from mine water utilizes a quaternary amine incorporated onto a porous styrene divinylbenzene bead. The amine has the ability to give up anions in exchange for anions in solution, in this case, uranium. When loaded with uranium to 0.06 pounds U per cubic foot the resin will be transported to an offsite facility to be regenerated with a concentrated brine solution in a split elution cycle. The regenerated resin will be returned to Mt. Taylor to be reused.

The following drawings should be referred to in conjunction with this Operation and Maintenance Manual (O&MM):

Drawing No.	Description
2	Symbols & Legend (Sheet 1 of 2)
3	Symbols & Legend (Sheet 2 of 2)
4	Equipment Layout Plan
5	Foundation Containment Plan
6	Miscellaneous Details
7	Process Flow Diagram
8	P&ID - Mine Water Wet Well
9	P&ID - IX Columns (Trains 1 & 2)
10	P&ID - Resin Storage and Transfer

III. Facility Description

Refer to Drawing Number 4 - Equipment Layout Plan for the location of the various items described below. The Mt. Taylor IX Plant consists of five mine water pumps, four operating and a spare, seven IX trains with two IX columns each (14 columns total), two loaded resin storage columns, one overflow storage tank and two resin transfer water storage tanks. All of the above equipment except the mine water pumps are enclosed within the building. Also housed inside of the building are the motor control center (MCC), office, control room and restroom.

A. Mine Water Pumping

Mine Water gravity flows from the treatment lagoons to a wet well located adjacent to the IX building on the south side. The wet well has dimensions of 30

ft. x 6 ft. x 8 ft. 4 in. deep. The mine water wet well is covered by a platform which supports the five mine water transfer pumps (MWP-1, 2, 3, 4, and 5). Each mine water pump has a capacity of 2,500 gpm. For the plants' capacity of 10,000 gpm, four pumps are operating with one full spare.

B. Ion Exchange

The IX portion of the facility is located within the building and consists of seven trains of two IX columns each (14 columns total). Each train has a capacity of 1,650 gpm or one-sixth the total plants flow. The IX trains are arranged so that water will gravity flow from the first (lead) column (IX-1, 3, 5, 7, 9, 11, and 13) in each train to the second (tail) column (IX-2, 4, 6, 8, 10, 12, and 14). Water from the tail column in each train will then gravity flow to the plant discharge. Each column is provided with overflow screens to prevent resin loss. Each column has a diameter of 12 ft with a 12 ft straight sidewall, and is loaded with approximately 400 ft^3 of resin.

C. Resin Transfer

The resin transfer system consists of two resin transfer water storage tanks (T-2A/2B), a single process water pump (P-2), and two loaded resin storage tanks (T-3A/3B). The resin is transferred as a slurry with water and will incorporate the use of eductors at each vessel. Eductors are a type of device that uses liquid pressure as a motive force to effectively convey granular solids or slurries over relatively short distances. The eductors are supplied with process water from a 200 gpm centrifugal pump which is sufficiently sized for transferring resin from one vessel at a time.

Once the resin has been loaded with uranium in the IX columns, the resin from a given column will first be transferred to one of two loaded resin storage tanks, each capable of holding 1,000 ft^3 of resin. The purpose of the loaded resin storage tank is to temporarily hold loaded resin while it awaits transport to the offsite facility for regeneration. The loaded resin will then be transferred to a resin tanker that can hold up to 1,500 ft^3 of resin. This resin tanker will transport the loaded resin to the regeneration facility and then return regenerated resin back to Mt. Taylor to be put back into service.

Facilities are provided for hydraulic transport of the resin between the IX columns, loaded resin storage tanks, and resin tanker. To reduce water consumption, water used to transport resin throughout the facility will be recycled and stored in the resin transfer water storage tanks.

D. Instrumentation

The control system that RGR proposes to install in the IX Plant will be a computer-based system. It will incorporate an active screen for each process and will display real time activities of tank levels and process flow rates. This system will have input from flow transmitters and level transmitters. The IX system will

be monitored by operators and a Programmable Logic Controller (PLC) located in the control room.

E. Plant Utility

The following utility services are provided at the IX Facility: electricity, potable water, process water and instrument air. A 13.8 KV line delivers primary power from the Mt. Taylor Mine to a transformer for conversion to 440/220 volts. Distribution to plant users is through the MCC. Potable water is delivered to the IX Facility through an underground line originating at the Barium Chloride Building. Process water is provided at appropriate locations at a pressure of 60 pounds per square inch (psi). Filtered and dried instrument air is supplied by a 23.5 actual cubic feet per minute (ACFM) compressor at 100 psi for operation of pneumatic controls.

F. Support Facilities

Forced air heating is provided for the entire IX building. The office, MCC and restroom are air conditioned.

IV. Plant Operation

A. Mine Water Pumping

Refer to Drawing 8 - P&ID - Mine Water Wet Well

1) The mine water wet well is equipped with an inlet line from the mine water ponds and a bypass line that can in emergency situations feed excess water to the radium removal system.

2) Under normal operations Valves V901 and V902 are fully open and the Isolation Valve V903 is closed.

3) The mine water pumping system is designed so that four of the five mine water transfer pumps will provide the necessary capacity. The fifth pump provides backup capacity.

4) Before starting the mine water pumps, the operator should select the desired wet well level for the level indicator controller (LIC located in the control room).

5) Two IX trains will be valved open to accept mine water flow and one mine water pump will be turned on. The operator will adjust fluid flow through both IX trains prior to placing a second pump and any additional trains in

service. This procedure will be followed until the desired water flow is obtained.

6) The mine water wet well is provided with level control which will automatically maintain a constant level within the wet well. This is accomplished through the use of Variable Frequency Drive (VFD) on each mine water pump (MWP-1, MWP-2, MWP-3, MWP-4 and MWP-5). The level controller is set at a predetermined elevation that will adjust the VFD accordingly to maintain this level set point. The level device will be installed in the wet well to cover the operating level range. In the event that the level continues to increase, the operator must manually reduce the incoming fluid to the mine water wet well. If the level drops below the low-low setting, the pumps will sequentially turn off to protect the pumps from insufficient fluid level.

7) To shut off the flow of water to the IX Plant, the following sequence should be observed:
    - Open Valve V903
    - Close Valves V901 & V902

   The IX Plant will now be bypassed and all mine water will flow from the settling ponds to the Barium Chloride Treatment Facility.

8) To initiate flow of mine water to the IX Plant, the following sequence should be observed:
    - If Closed, Open Valves V901 & V902
    - Close Valve V903

   The operator should visually observe the water levels in the mine water wet well at the IX Plant to insure that no obstructions are impeding the flow of water.

B. Ion Exchange

Refer to Drawing 9 - P&ID - IX Columns (Trains 1 & 2)

The IX Plant will utilize seven identical trains. Each train will have a capacity of 1,650 gpm and will consist of two (2) 12-foot diameter columns in each train. The operation of one train is described below as an example. The components and functions will be identical for the remaining trains.

Feed water is delivered by the mine water transfer pumps to the main plant header. This 24-inch diameter header is located above the IX columns. A mag

meter (M-MW) is located in the header with a flow recorder (FR-MW) and low flow alarm (FAL-MW) is located in the control room.

Prior to initiating flow to the IX columns, the operator should check the resin drain Valves V211 and V212, located below the IX column tank, to insure that they are both closed. Valves V112 and LCV-2 should be closed. Valve V110 should now be opened. The flow control valve (FCV-1) will regulate the flow to the IX train.

To begin flow to the Lead IX column, open Valve V110, check to make sure V112 and LCV-2 are closed and set FCV-1 to 25 percent of desired flow rate. Check the resin depth in the column and make sure flow has been established throughout train number one. Repeat this on train number 2 and then start increasing the flow rate through both trains by adjusting the VFD on the mine water pump and FCV to the desired flow rate.

The IX trains are designed with the capability of bypassing both the lead and tail IX columns. The FCV or LCV (LCV for tail column and FCV for lead column) will maintain a constant level in the IX column by opening and closing depending on observed levels and flow rates. If the LCV or FCV fails and the level increases past the first set point the operator will be notified by the level alarm high (LAH). In the event that the LCV still cannot control the flow, the level will continue to increase to the second set point. At this point, the operators will place the spare IX train in service which will receive flow diverted from the upset IX column. If the spare train is not ready to receive flow, the level alarm high high will sound and the bypass valve will open automatically. This will divert flow from the upset Tail IX column to the overflow storage tank.

C. Resin Transfer

Refer to Drawing 7 - Process Flow Diagram

Refer to Drawing 9 - P&ID - IX Columns (Trains 1 & 2)

Refer to Drawing 10 - P&ID - Resin Storage and Transfer

When the resin in the lead column of an IX train is loaded to about 0.06 pounds/ft^3 with uranium, a resin transfer cycle will begin and proceed in the following order.

1. The resin will first be transferred from the lead IX column to the loaded-resin storage tanks.
2. The partially loaded resin from the tail IX column will then be transferred to the lead IX column.
3. Stripped (regenerated) resin will be transferred from the resin tanker to refill the tail IX column.
4. Loaded resin will be transferred from a loaded resin storage tank to the resin tanker.

The loaded resin will be removed from the lead IX column(s) (IX-1, 3, 5, 7, 9, 11, 13) by an eductor, where it is fluidized by the resin transfer water and conveyed through a 4" steel pipe at 200 gpm to the loaded resin storage columns. The transfer lines between each IX column have a clear inline sight glass so that the operator can determine when all of the resin has been removed. The inline sight glass will also allow the operator to ensure that the resin is in fact moving out of the IX column. The loaded resin storage columns (T-3A and T-3B) are located in the northeast quadrant of the building and are 8 ft in diameter by 20 ft high. The resin transfer water pump (P-2) will provide water from the resin transfer water storage tanks (T-2A and T-2B) at the necessary flow rate and pressure to fluidize the resin and transport it through the resin transfer cycle.

The partially loaded resin will then be removed from the tail IX column by an eductor and hydraulically transported to the lead IX column. This process will begin immediately after the loaded resin has been removed from the lead IX column.

The regenerated ion exchange resin will be transferred hydraulically from the resin tanker to the tail IX column(s) (IX-2, 4, 6, 8, 10, 12, or 14). This process will begin immediately after the partially loaded resin has been removed from the tail IX column, and transferred to the lead IX column.

The loaded resin will then be transferred from either T-3A or T-3B to the resin tanker. The resin transfer volume from the loaded resin storage tanks to the resin tanker is determined by the level indicator controller. The operator will open the resin tanker compartment hatch and drop the resin transfer hose into the designated receiving compartment. Once this is complete, the resin transfer water pump (P-2) and the resin outlet valve for either of the resin storage tanks will open. The "resin out" valve will close when the level indicator controller reaches a predetermined level change equal to 400 ft^3. Excess water drained from the resin tanker during the resin transfer process will be picked up by a sump (SP-1), and pumped through a filter (F-1, F-2, or F-3) prior to being sent back to resin transfer water storage tanks (T-2A or T-2B). The reason for filtering and recycling is to minimize water consumption. The hose connection from the tanker to the resin eductor will have a "no-spill" check valve and a clear sight glass. The purpose of the sight glass will be to provide the operator with a view of the media being transferred, enabling the operator to determine when all of the resin has been transferred. The no-spill check valve will prevent water and/or resin from spilling during connection and disconnection.

D. Instrumentation

1. Mine Water Sump and Pumps

Mine Water Transfer Pumps will have local start-stop switches with a stop only switch located in the control room. In the event of low level in the mine water sump, the level indicator controller (LIC-MW) will adjust the

pump speed and activate the level alarm low (LAL-MW) in the control room. Further reduction in level by 12 inches will trip level alarm low low (LALL-MW) and all pumps. The mine water wet well will also be provided with an overflow line to prevent the sump from overtopping. This sump overflow will go directly to the radium removal system.

Mine Water transfer pumps should hold a discharge pressure of at least 10 psi for proper operation of flow control valves at the IX columns.

The 24" diameter mine water header flow will be monitored downstream of the process water take-off. A recorder and low flow alarm will be provided in the control room. The low flow alarm point will be set at 2500 gpm.

2. Lead IX Columns

The control system proposed for the IX facility will display real time activities of tank levels and process flow rates by receiving input from transmitters and indicators throughout the plant. The instrumentation, placement, and function of the controls system is described below.

Flow of mine water to each IX column will be controlled either at the valve or in the control room as described below. Local flow readout will be provided for manual control.

Primary Control

The first magnetic flow meter (mag meter) monitoring each train will be placed on the common header. The mag meter (M-MW) will measure the total flow being delivered to the IX process by the pumps. The mag meter output signal will be transmitted through the flow indicator transmitter (FIT-MW) to the flow recorder (FR-MW) and the flow alarm low (FAL-MW). The FR-MW will record the real time flow and store it digitally for record keeping. The flow alarm low (FAL-MW) will activate or deactivate if the flow is below the pre-determined set point. FAL-MW will be an audible and visible alarm to alert the operator and other personnel of an inadequate flow rate. Downstream of M-MW the flow will enter a common header and be divided into the seven trains.

Each of the seven lead IX columns will be equipped with a mag meter (M-1, 3, 5, 7, 9, 11, 13) located on the supply line to each of the seven trains. The mag meter will be upstream of the flow control valve (FCV-1, 3, 5, 7, 9, 11, 13) and the lead column. The mag meter will measure the flow being delivered to each IX column. The mag meter output signal will be transmitted through the flow indicator transmitter (FIT-1,3, 5, 7, 9, 11, 13) to the flow indicator controller (FIC-1, 3, 5, 7, 9, 11, 13) and flow recorder (FR-1, 3, 5, 7, 9, 11, 13), both of which will be located in the control room. The flow recorder will digitally record data for recordkeeping. The

flow indicator controller will be programmable so that the operator can set it to maintain a desired flow rate. The flow indicator controller will send a signal to a flow control valve which will open and close to maintain the desired flow rate set on the flow indicator controller. The flow indicator controller will also activate or deactivate the flow alarm high (FAH-1, 3, 5, 7, 9, 11, 13). The flow alarm high will be an audible and visible alarm whose set point can be determined and programmed by the operator.

Secondary Control

Each of the seven lead IX columns will be equipped with a sonic level sensor, located in the column tank, which will send its output signal to a level indicator transmitter (LIT-1, 3, 5, 7, 9, 11, 13). The level indicator transmitter will transmit a signal to the level indicator controller (LIC-1, 3, 5, 7, 9, 11, 13). The level indicator controller will be located in the control room and display the water level in each lead column in real time. The level indicator controller will also be programmable to maintain a certain set point level. The purpose of the level indicator controller is to monitor tank levels and to insure that the levels are not high enough to overtop the tanks and cause a spill. The level indicator controller will communicate to the lead column flow control valve (FCV-1, 3, 5, 7, 9, 11, 13), the level alarm high (LAH-1, 3, 5, 7, 9, 11, 13), and the level alarm high high (LAHH-1, 3, 5, 7, 9, 11, 13). In the event that the first level set point has been reached the level indicator controller will activate the level alarm high to notify the operator. The level indicator controller will also adjust the flow control valve appropriately to maintain the programmed set point and prevent a spill. In the event that the level indicator controller is not able to resolve the abnormally high water level by manipulating the flow control valve and the second set point is reached, the level indicator controller will activate the level alarm high high and the operator will be able to manually divert the entire flow around the high level column to the tail IX column. The tail IX columns will have the ability to divert excess flow from the lead IX columns to the overflow storage tank (T-1).

3. Tail IX Columns

Each of the seven tail IX columns will be equipped with a sonic level sensor, located in the column tank, which will send its output signal to a level indicator transmitter (LIT-2, 4, 6, 8, 10, 12, 14). The level indicator transmitter will transmit a signal to the level indicator controller (LIC-2, 4, 6, 8, 10, 12, 14). The level indicator controller will be located in the control room and display the water level in each tail column in real time. The level indicator controller will also be programmable to maintain a certain set point level. The purpose of the level indicator controller is to monitor tank levels and to insure that the levels are not high enough to overtop the tanks and cause a spill. The level indicator controller will communicate to the tail column level control valve (LCV-2, 4, 6, 8, 10,

12, 14), the level alarm high (LAH-2, 4, 6, 8, 10, 12, 14), and the level alarm high high (LAHH-2, 4, 6, 8, 10, 12, 14). In the event that the first level set point has been reached the level indicator controller will activate the level alarm high to notify the operator, the level indicator controller will also adjust the level control valve appropriately to maintain the programmed set point and prevent a spill. In the event that the level indicator controller is not able to resolve the abnormally high water level by manipulating the level control valve and the second set point is reached, the level indicator controller will activate the level alarm high high. When the level alarm high high is activated the level control valve will be closed 100% and all flow to the tail IX column will be diverted to the overflow storage tank (T-1).

E. Quality Control of Discharge Fluids

1. Sampling of Discharge Fluids

a. Composite sampling will be performed for all IX Tail columns, total discharge stream of the IX system and the total discharge stream leaving the facility.
b. This composite sampling will be on an eight (8) hour schedule and will incorporate a duplicate sample bottle for third party assay.
c. The operator will grab samples every eight (8) hours from each lead and tail IX column to determine when resin transfer must occur to keep the system discharge stream below the 30 ppb standard for uranium.

2. Test Method

a. The test method for uranium will follow the ASTM D5174 Standard. This test method for trace uranium in water uses Pulsed-Laser Phosphorimetery analyzed by a KPA (Kinetic Phosphorescence Analyzer). This analyzer achieves highly specific analysis for uranium down to 0.01 µg/L with an analytical range of over 500,000 µg/L.
b. The third party assay laboratory will be a NELAC-certified laboratory that will use a KPA system or other method(s) with detection capabilities sufficient to reliably detect down to 0.01 µg/L.

APPENDIX A

DOWEX 21K 16/20

A High Efficiency, Large Bead, Strong Base Anion Exchange Resin for Mineral Processing Applications

Product	Type	Matrix	Functional group
DOWEX* 21K 16/20	Type I strong base anion	Styrene-DVB, gel	Quaternary amine

Guaranteed Sales Specifications		Cl^- form
Total exchange capacity, min.	eq/L	1.2
Bead size distribution		
Thru 20 mesh, max.	%	10
Thru 25 mesh, max.	%	2

Typical Physical and Chemical Properties		Cl^- form
Water content	%	50 - 58
Whole uncracked beads	%	90 - 100
Total swelling ($Cl^- \Rightarrow OH^-$)	%	20
Particle density	g/mL	1.08
Shipping weight	g/L	690
	lbs/ft^3	43

Recommended Operating Conditions

- Maximum operating temperature:
  - OH^- form: 60°C (140°F)
  - Cl^- form: 100°C (212°F)
- pH range: 0 - 14
- Bed depth, min.: 800 mm (2.6 ft)
- Flow rates:
  - Service/fast rinse: 5 - 50 m/h (2 - 20 gpm/ft^2)
  - Backwash: See figure 1
  - Co-current regeneration/displacement rinse: 1 - 10 m/h (0.4 - 4 gpm/ft^2)
- Total rinse requirement: 3 - 6 Bed volumes
- Regenerant:
  - Type: NaCl/Carbonate
  - Temperature: Ambient or up to 50°C (122°F) for silica removal
- Organic loading, max.: 3g $KMnO_4$/l resin

Typical properties and applications

DOWEX 21K 16/20 type I strong base anion resin has excellent kinetics, excellent regeneration efficiency and outstanding physical stability. This enhanced-porosity gel bead product is made by a special process giving enhanced resistance to organics and fast equilibrium rates. The DOWEX 21K family of resins is specially suited for mineral processing and groundwater remediation applications. DOWEX 21K 16/20 type I strong base resin is suited for fluidized-bed and Resin-in-Pulp applications.

Packaging

5 cubic foot fiber drums

Figure 1. Pressure Drop vs. Flow Rate

For DOWEX 21K Resins, Cl, 77 deg. F

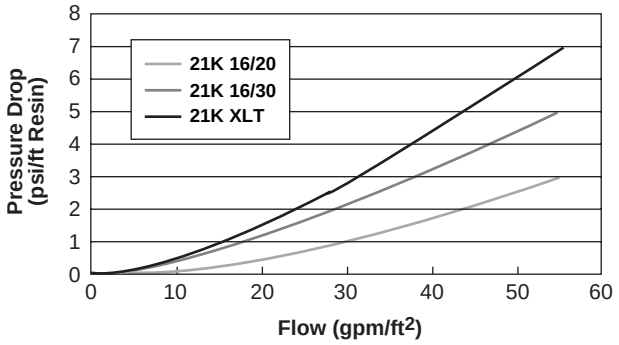
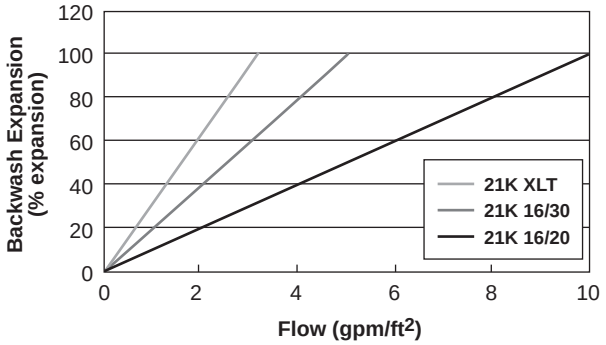


Figure 2. Backwash Expansion vs. Flow Rate

For DOWEX 21K Resins, Cl, 77 deg. F



DOWEX Ion Exchange Resins

For more information about DOWEX resins, call the Dow Liquid Separations business:

North America:	1-800-447-4369
Latin America:	(+55) 11-5188-9222
Europe:	(+32) 3-450-2240
Pacific:	+60 3 7958 3392
Japan:	+813 5460 2100
China:	+86 21 2301 9000

http://www.dowex.com

Form No. 177-01892-1005

APPENDIX E

Summary Report of Pipeline Outfall Investigations

Treated Mine Water Pipeline Outfall 001 at San Lucas Canyon

Mt Taylor Mine

Background

In its letter to RGR dated 8/2/2013, the Ground Water Quality Bureau of NMED provided comments on RGR's application of 4/5/2013 for revision of the Mt Taylor Mine permit to active status and modification of its Discharge Permit D-61. One of those comments stated that:

> "…NMED is concerned that ground water from renewed discharge to this outfall could exceed the current state ground water uranium standard, and possibly other promulgated ground water quality standards as well".

To address those concerns, NMED requested that RGR submit a plan for:

> "…the collection and analysis of sediment and ground water quality data at the San Lucas Canyon outfall location, as appropriate. Additionally please include monitoring well locations to monitor ground water quality and levels during the proposed discharge activities in RGRC's proposal".

In its response to NMED dated 8/29/2013, RGR proposed a plan for an outfall area investigation (Figure E-1). This Work Plan is described in the following section. Working within the constraints of weather and contractor availability, RGR conducted the field investigations and laboratory testing during September-November 2013.

Attached to this report are the Work Plan as well as data records for field investigations and laboratory testing. The following summarizes these activities and documents the results of the investigations.

Work Plan Summary

RGR submitted its WORK PLAN, INVESTIGATION OF SOIL AND GROUND WATER FOR POSSIBLE URANIUM CONTAMINATION AT MINE WATER PIPELINE OUTFALL 001, MT. TAYLOR MINE on 10/06/2013 following written and verbal comments from NMED on the draft plan submitted on 9/12/2013. This final Work Plan is attached to this report. The plan included:

- Samples of alluvial soil collected from six locations, two upstream and four downstream of the outfall, in the bottom of the arroyo at one-foot intervals to approximately 4.0 feet

- Samples of alluvial soil collected from four test borings in 5-ft. intervals at elevations deeper than the arroyo channel. One of the test borings was to be upstream of the outfall, and the others were to be downstream.
- These samples collected, logged by an RGR representative, packaged in durable plastic bags or jars, recorded on a Chain of Custody form, and delivered to a qualified analytical chemistry laboratory for testing for total U concentration using EPA Method 6010.
- If U concentrations in soil downstream indicate U contamination above background from the pre-1990 mine water discharge, leaching tests were to be performed using Synthetic Precipitation Leaching Procedure (SPLP), EPA Method 1312 to estimate how much U could be re-mobilized by the clean mine discharge water.
- Monitoring wells installed in the test borings after sampling down to bedrock, but if no water is encountered during drilling at the upstream test boring location (see Figure E-2)), no monitoring well is to be installed there. Otherwise, the #OFMW-01 monitoring well will be a background well.
- If ground water was not encountered above the top of rock in a test boring, the driller was to continue drilling 5 feet into rock or refusal.
- Each monitoring well was to be installed in accordance with the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) *Monitoring Well Construction and Abandonment Guidelines*.

The investigations were performed in conformance with this plan, with no variances other than 1) the addition of a seventh soil sampling location next to a sample location where a shallow boulder limited sampling depth, and 2) addition of three soil samples from the San Lucas sediment pond basin.

Field Investigations

Soil sampling near Outfall 001 was performed during the week of October 7, 2013. Samples were collected at OF locations listed on Table E.1 and shown on Figure E-2 at one-foot intervals using a manually-operated bucket auger. Samples were immediately placed in glass jars with lids and labeled, then recorded on field logs and chain-of-custody forms.

Test borings were drilled and monitoring wells installed during the week of October 28, 2013 at locations listed on Table E.1 and shown on Figure E-2. Drilling was attempted using air for the drilling fluid, but at shallow depths the borehole walls became unstable, requiring the driller to switch to water with biodegradable soap as the drilling fluid. The logs and construction details of the monitoring wells are shown on Figure E-3 and Figure E-4.

After the wells were evacuated of drilling fluid and developed according to the Work Plan, the wells were allowed to sit for 10 days so that natural water levels could return. The wells were measured at that time (11/11/2013) to record water levels, then sampled to collect water for testing. Only wells OFMW-03 and OFMW-4 had enough water in the well to yield a water sample.

At the request of the GWQB, an additional set of soil samples was collected for uranium content testing. Three soil samples were collect manually from 0.5-1.0 foot depth in the San Lucas sediment pond basin (Figure E-5) located at the north end of San Lucas Canyon (Figure E-1).

Laboratory Testing

Soil and water samples were tested for uranium content by Hall Environmental Analysis Laboratories Inc. (HEAL) in Albuquerque using EPA METHOD 6010B: SOIL METALS for uranium in soil and 200.8 ICPMS METALS for uranium in water. HEAL's reports are attached.

Because soil uranium concentrations were essentially background, no leaching tests were performed.

Results

Soil

The uranium content of soils sampled in the arroyo near the outfall (Figure E-2) were below detection limits (non-detect) for samples collected both upstream and downstream of the outfall with the exception of location OF-7, the northernmost sampling point, sample SS-3 at 30"-36", with uranium content of 7.1 mg/kg (ppm). This value compares to 9.96 mg/kg, the average natural uranium content of soil in the mine area.

The uranium content of soils sampled in the test borings at the monitor well locations (Figure E-2) were below detection limits (non-detect) for samples collected at locations both upstream and downstream of the outfall with the exception of location OFMW-04, the northernmost well location. In OFMW-04, the uranium content ranged from 3.4 to 14 mg/kg (ppm), compared to 9.96 mg/kg, the natural uranium content of soil in the mine area.

The uranium content of soils sampled in the San Lucas sediment pond (Figure E-5) were 12-30 mg/kg, which is slightly higher the mine-area natural background of 9.98 mg/kg and in the lower part of the range typical for volcanic and shale terrains (NMBGMR 2012).

These results show that the soils near and downstream of the pipeline outfall have not been contaminated with uranium from discharged mine water, and that the uranium values are within the range of natural uranium concentrations found in the mine area.

Ground Water

Of the four test borings drilled, only two encountered ground water. Test boring OFMW-01, upstream of the outfall, did not encounter ground water, and a monitoring well was not installed at that location.

Ground water was encountered in OFMW-03 and OFMW-04, and possibly in OFMW-02. Monitor wells were installed at those locations. Ten days after these wells were completed, the water levels were measured and samples were obtained for testing for uranium content.

The water levels from top of casing were:

OFMW-02 - 91.5 feet (total well depth 92.0 feet)

OFMW-03 – 87.6 feet (total well depth 88.0 feet)

OFMW-04 – 90.6 feet (total well depth 102.0 feet)

Although water was detected near the bottom of OFMW-02, no sample could be collected, probably because of moist sediment in the bottom 0.5 feet of the well.

Water samples were collected from OFMW-03 and OFMW-04. Uranium concentrations in the water samples were 0.0087 mg/L in OFMW-03 and 0.0027 mg/L in OFMW-04, both of which are well below the 20.6.2.3103A NMAC standard of 0.03 mg/L**.**

These results demonstrate that there is a saturated zone only at the alluvium/ bedrock contact 400 feet and further downstream of the outfall, providing only a very limited amount of ground water that could be available. The test results show that this water is not contaminated with uranium from the mine water discharge.

Future Studies

The foregoing results have addressed the GWQB concerns about impacts to ground water from mine water discharges. When RGR resumes mine water treatment, the treatment standard for uranium will be more stringent (0.03 mg/L) than the standard in place during previous operations (5 mg/L). Therefore, the cleaner future discharge will be protective of existing conditions, and no additional studies are necessary.

Once RGR resumes discharge from Outfall 001, quarterly water levels will be measured in the three wells. Annual samples of ground water will be tested for uranium.

REFERENCES

New Mexico Bureau of Geology and Mineral Resources (NMBGMR) , 2012; *Uranium - Where Is It Found?*, http://geoinfo.nmt.edu/resources/uranium/where.html

Table E.1 Outfall Area Soil Sample And Monitoring Well Location Coordinates

Point ID No.	Description	Northing	Easting	Elevation (feet)	Notes
OF-01	Soil Sample in Arroyo	1600801	2780257	7105	1
OF-02		1600854	2780432	7099	1
OF-03		1601101	2780833	7090	2
OF-04		1601211	2780938	7084	1
OF-05		1601210	2780942	7095	2
OF-06		1601419	2780968	7086	1
OF-07		1601660	2781047	7086	1
Outfall		1601020	2780747	7088	4
OFMW-01	Soil Boring	1600833	2780476	7108	5
OFMW-02	Monitoring Wells	1601073	2780925	7110	6
OFMW-03		1601250	2781000	7102	6
OFMW-04		1601914	2781403	7105	6
SLSP -01	Soil Sample in San Lucas Sediment Pond	1612626	2783429	6951	3
SLSP-02		1612772	2783457	6953	3
SLSP -03		1612912	2783602	6951	3

Notes:

1. Samples collected from the thalweg of the flow channel.
2. Sample collected from ledge above the flow channel about 5-6 feet up from the thalweg.
3. Sample collected 6 to 12 inches below the ground surface
4. The “Outfall” location is the thalweg of the arroyo where the pipe.
5. No water was encountered and no well installed. Elevation is the ground surface.
6. The elevations and coordinates of the monitoring wells are at the top of the steel well cap.

Coordinates in NAD 83 New Mexico West using a TOPCON GRS-1 hand-held GPS

Hand Auger test holes (OF-01 to OF-07) to 4’ depth

Hand Auger test holes (SLSP-01, SLSP-02 and SLSP-03) = 6 to12 inches depth.

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** OF-01

Location Outfall 001 GPS

Location Description UPSTREAM of OUTFALL

Field Engineer: ALAN KUHN Excavation Method: HAND AUGER

Date: 10/8/13 Operator:

Weather and Moisture Conditions: DRY - SUNNY - WARM

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	↑ SP	OF-1-S1	(SP) fine moist SAND, GREY/BROWN, TRACE CLAY
1		OF-1-S2	SAME
2		OF-1-S3	SAME
3	↓ (SP)	OF-1-S4	LENSE OF SANDY CLAY at 3.5' (SP) fine moist SAND, TAN, TRACE GRAVEL
4			
5			
6			

Total Depth: 4'

Comments:

SAMPLES TAKEN at Bottom of Thalweg

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** OF-02

Location Outfall 001 GPS

Location Description UPSTREAM of OUTFALL IN THALWEG

Field Engineer: ALAN KUHN Excavation Method: HAND AUGER

Date: 10/8/13 Operator:

Weather and Moisture Conditions: DRY, SUNNY, WARM

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	(SP)	OF-2-S1	(SP) fine, SAND, TAN, MOIST
1	CL	OF-2-S2	(CL) CLAY, GREY/BROWN - HARD
2	SC	OF-2-S3	(SC) CLAYEY SAND, fine, TAN, MOIST
3	(SP)	OF-2-S4	(SP) FINE SAND, TAN, TRACE GRAVEL, MOIST
4			
5			
6			

Total Depth: 4'

Comments:

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** OF-03

Location Outfall 001 GPS

Location Description 50' DOWNSTREAM of outfall in Thalweg

Field Engineer: ALAN KUHN Excavation Method: HAND AUGER

Date: 10/8/13 Operator:

Weather and Moisture Conditions: DRY, SUNNY, WARM

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	SP	OF-3-S1	(SP) fine SAND, BROWN, TRACE GRAVEL, moist
1		OF-3-S2	(SP-SM) fine SAND, BROWN, TRACE CLAY/SILT
2		OF-3-S3	(SP) fine SAND, TAN, TRACE TO SOME GRAVEL
3	SP	OF-3-S4	
4			
5			
6			

Total Depth: 4'

Comments:

Hit a layer of GRAVEL at 39"

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** OF-4

Location Outfall 001 | GPS

Location Description DOWNSTREAM of Outfall IN THALWEG

Field Engineer: ALAN KUHN | Excavation Method: HAND AUGER

Date: 10/8/13 | Operator:

Weather and Moisture Conditions: DRY, SUNNY, WARM

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	↑ SW	OF-4-S1	(SW) SAND, TRACE GRAVEL, TAN/ BROWN, MOIST
1	↓	OF-4-S2	↓
2			
3			
4			
5			
6			

Total Depth: 2'

Comments:

HIT ROCKS at 2' COULD NOT PENETRATE

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** OF-05

Location Outfall 001 GPS

Location Description Adjacent TO OF4 ON channel shelf

Field Engineer: ALAN KUHN Excavation Method: HAND Auger

Date: 10-8-13 Operator:

Weather and Moisture Conditions: DRY, SUNNY, WARM

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	(SP)	OF5-S1	(SP) FINE SAND, BROWN, TRACE CLAY
1		OF5-S2	
2		OF-5-S3	(SC) CLAYEY SAND, BROWN, MOIST
3	(SC)	OF-5-S4	↓ SAME
4			
5			
6			

Total Depth: 4'

Comments:

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** OF-06

Location Outfall 001 GPS

Location Description DOWNSTREAM OF OUTFALL - IN THALWEG

Field Engineer: ALAN KUHN Excavation Method: HAND Auger

Date: 10-9-13 Operator:

Weather and Moisture Conditions: DRY, WARM, SUNNY

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	SW	OF6-S1	(SW), SAND, fine to Medium, TRACE GRAVEL, BROWN, MOIST
1		OF6-S2	GRAVEL SEAM at 18"
2	SW	OF6-S3	(SM) SILTY SAND, TRACE GRAVEL, TRACE CLAY BROWN, MOIST
3	(SM) / (SP)	OF6-S4	(SP) FINE SAND, TAN, TRACE GRAVEL, MOIST
4			
5			
6			

Total Depth: 4'

Comments:

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** OF-07

Location Outfall 001 | GPS

Location Description NEAR MAIN CANYON IN THALWEG

Field Engineer: ALAN KUHN | Excavation Method: HAND AUGER

Date: 10-8-13 | Operator:

Weather and Moisture Conditions: DRY, SUNNY, WARM

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	(SP)	OF-7-S1	(SP) - fine to medium SAND, BROWN, moist
1	↑	OF7-S2	(SP) fine SAND, TAN, moist
2	(SM) ↓ ////	OF7-S3	(SM) silty fine SAND, GREY, moist TO wet
3	(CL) (SC)	OF7-S4	(CL) CLAY, some SAND, Dark grey, STIFF (SC) - CLAYEY SAND, GREY, BROWN, moist
4			
5			
6			

Total Depth: 4'

Comments:

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** SLSP-02

Location Outfall 001 GPS

Location Description SAN LUCAS Sediment POND

Field Engineer: ALAN KUHN Excavation Method: HAND AUGER

Date: 10-11-13 Operator:

Weather and Moisture Conditions: DRY COOL

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	CL	SLSP-02-S1	(CL) CLAY - DARK BROWN - MOIST
1			
2			
3			
4			
5			
6			

Total Depth: 12"

Comments:

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** SLSP-01

Location Outfall 001 | GPS

Location Description SAN LUCAS Sedimentation POND

Field Engineer: ALAN KUHN | Excavation Method: HAND Auger

Date: 11-11-13 | Operator:

Weather and Moisture Conditions: DRY, COOL

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	CL	SLSP-1-S1	(CL) CLAY - DARK BROWN - Moist
1			
2			
3			
4			
5			
6			

Total Depth: 12"

Comments:

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION

File #

Mt Taylor Mine Outfall 001 Area Soil Sampling Log **Sample Location #** SLSP-03

Location Outfall 001 | GPS

Location Description SAN LUCAS Sediment POND

Field Engineer: ALAN KUAN | Excavation Method: HAND AUGER

Date: 11-11-13 | Operator:

Weather and Moisture Conditions: DRY COOL

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0	/// CL	SLSP-03-S1	(CL) CLAY, DARK BROWN - MOIST
1			
2			
3			
4			
5			
6			

Total Depth: 12"

Comments:

Checked: Date:

Approved: Date:

RIO GRANDE RESOURCES CORPORATION MT. TAYLOR MINE

WELL # **0FMW-01**

Soil Boring Log

DATE STARTED	10/28/13	COMPLETED 10/28/13	LOGGED BY	Ed Loescher	
LOCATION	NAD 83 New Mexico West-Grid		N 1600832.793	E 2780475.944	
LAT	LONG	GROUND ELEVATION, ft AMSL	7108		
DRILLING METHOD	Rotary Wash with Tricone Bit		DRILLER: Hathorn Drilling Services		
DRILLED DEPTH, ft	70'	DRILLED DIAMETER, inches 8 "			

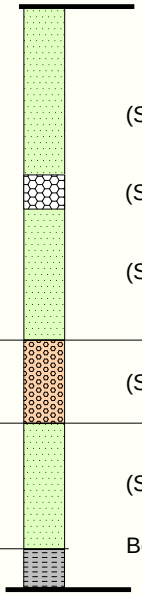
No well was installed at this location because groundwater was not encountered in the drill hole.

After completion the drill hole was backfilled with cuttings.

DEPTH TO WATER, ft.	Date	No Water Encountered				
	Ft					

WELL LOG

Depth (ft)	Sample# Cuttings	Sample# Water	Material Description
Ground Surface	GS	GS	Ground Surface
10'	OFMW02-S1		(SM) Silty Sand, Fine, Trace Gravel, Grey/Brown
20'	OFMW02-S2		
	OFMW02-S3		(SP) Gravelly Sand, Medium, Tan/Brown
30'	OFMW02-S4		
	OFMW02-S5		(SM) Silty Sand, Fine, Trace Gravel, Grey/Brown
40'	OFMW02-S6		
	OFMW02-S7		(SC) Clayey Sand, Fine, Trace Gravel, Grey/Brown
50'			
	OFMW02-S8		
60'	OFMW02-S9		(SM) Silty Sand, Fine, Trace Gravel, Brown
	OFMW02-S10		Bedrock- Driller reported hitting hard rock at 65'
70'			Bottom of drilled hole =70'
80'			
90'			



RIO GRANDE RESOURCES CORPORATION MT. TAYLOR MINE

WELL # **0FMW-02**

MONITORING WELL LOG AND INSTALLATION RECORD

DATE STARTED 10/28/13	COMPLETED 10/28/13	LOGGED BY Ed Loescher	
LOCATION NAD 83 New Mexico West-Grid		N 1601072.637	E 2780925.160
LAT	LONG	GROUND ELEVATION, ft AMSL 7106.34	
DRILLING METHOD Rotary Wash with Tricone Bit		DRILLER: Hathorn Drilling Services	
DRILLED DEPTH, ft 90'	DRILLED DIAMETER, inches 8 "		

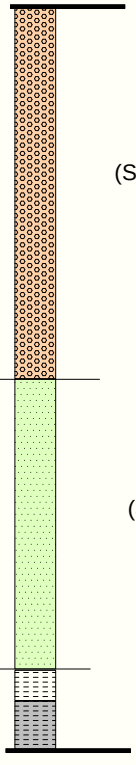
INSTALLED WELL

WELL CASING	SCH 80 PVC Flush Thread Connections				
Material		ID, inches	3.970"	Thickness, inches	.265
Length below ground surface, ft	78'	Length above ground surface, ft	3.75'		
SCREEN					
Material	SCH 80 PVC	ID, inches	3.970"	Slot size, inches	0.010"
Installed depth , ft	from 78'	to	88'		
FILTER					
Material	Silica Filter Sand	Size	Medium	Placed from 90' ft	to 73' ft
SEAL					
Material	Bentonite chips	Amount	2 Bags	Placed from 73' ft	to 70' ft
Material		Amount		Placed from ft	to ft
BACKFILL (dry hole only)	Material			Placed from ft	to ft
WELL SHROUD	6" x 6" Tublar Steel with 8" thick concrete collar - 3.75' above the ground surface				ft

DEPTH TO WATER, ft.	Date	11/11/13					
	Ft	87.5' (No Sample)					

WELL LOG

Depth (ft)	Sample# Cuttings	Sample# Water	Material Description
Ground Surface	GS	GS	Ground Surface
10'			
20'			(SC) Clayey Sand, Fine, Trace Gravel, Grey/Brown
30'	OFMW02-S1		
40'	OFMW02-S2		
	OFMW02-S3		
50'	OFMW02-S4		
	OFMW02-S5		
60'	OFMW02-S6		(SP-SM) Sand, Medium, Some Gravel and Silt, Brown
	OFMW02-S7		
70'	OFMW02-S8		
	OFMW02-S9		
80'	OFMW02-S10		Driller reported hitting soft rock at 80'
	OFMW02-S11		Bedrock- Driller reported hitting hard rock at 85'
90'			Bottom of drilled hole =90'
100'			



RIO GRANDE RESOURCES CORPORATION MT. TAYLOR MINE

WELL # **0FMW-03**

MONITORING WELL LOG AND INSTALLATION RECORD

DATE STARTED 10/29/13	COMPLETED 10/29/13	LOGGED BY Ed Loescher	
LOCATION NAD 83 New Mexico West-Grid		N 1601250.246	E 2781000.058
LAT	LONG	GROUND ELEVATION, ft AMSL 7098.82	
DRILLING METHOD Rotary Wash with Tricone Bit		DRILLER: Hathorn Drilling Services	
DRILLED DEPTH, ft 87'	DRILLED DIAMETER, inches 8 "		

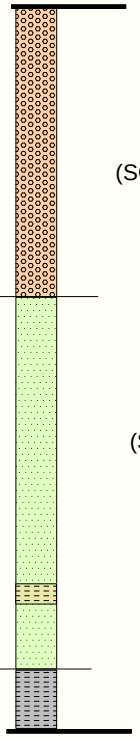
INSTALLED WELL

WELL CASING Material	SCH 80 PVC Flush Thread Connections	ID, inches	3.970"	Thickness, inches	.265
Length below ground surface, ft	75'	Length above ground surface, ft	3.45'		
SCREEN Material	SCH 80 PVC	ID, inches	3.970"	Slot size, inches	0.010"
Installed depth , ft from	75'	to	85'		
FILTER Material	Silica Filter Sand	Size	Medium	Placed from 87' ft	to 70' ft
SEAL Material	Bentonite chips	Amount	2 Bags	Placed from 70' ft	to 65' ft
Material		Amount		Placed from ft	to ft
BACKFILL (dry hole only) Material				Placed from ft	to ft
WELL SHROUD	6" x 6" Tublar Steel with 8" thick concrete collar - 3.45' above the ground surface				ft

DEPTH TO WATER, ft.	Date	11/11/13					
	Ft	84.5'					

WELL LOG

Depth (ft)	Sample# Cuttings	Sample# Water	Material Description
Ground Surface	GS	GS	Ground Surface
10'			
20'	OFMW03-S1		(SC) Clayey Sand, Fine, Trace Gravel, Grey/Brown
30'	OFMW03-S2		
	OFMW03-S3		
40'	OFMW03-S4		
	OFMW03-S5		
50'	OFMW03-S6		
	OFMW03-S7		(SM) Silty Sand, Medium, Trace Gravel, Lt. Brown
60'	OFMW03-S8		
	OFMW03-S9		
70'	OFMW03-S10		
	OFMW03-S11		Driller reported hitting a layer of soft rock at 70'
80'			Bedrock- Driller reported hitting hard rock at 82'
			Bottom of drilled hole =87'
90'			
100'			



RIO GRANDE RESOURCES CORPORATION MT. TAYLOR MINE

WELL # **0FMW-04**

MONITORING WELL LOG AND INSTALLATION RECORD

DATE STARTED 10/29/13	COMPLETED 10/30/13	LOGGED BY Ed Loescher	
LOCATION NAD 83 New Mexico West-Grid		N 1601913.753	E 2781402.648
LAT	LONG	GROUND ELEVATION, ft AMSL 7100.07	
DRILLING METHOD Rotary Wash with Tricone Bit		DRILLER: Hathorn Drilling Services	
DRILLED DEPTH, ft 100'	DRILLED DIAMETER, inches 8 "		

INSTALLED WELL

WELL CASING Material	SCH 80 PVC Flush Thread Connections	ID, inches	3.970"	Thickness, inches	.265
Length below ground surface, ft	88'	Length above ground surface, ft	3.83'		
SCREEN Material	SCH 80 PVC	ID, inches	3.970"	Slot size, inches	0.010"
Installed depth , ft from	88'	to	98'		
FILTER Material	Silica Filter Sand	Size	Medium	Placed from 100' ft	to 83' ft
SEAL Material	Bentonite chips	Amount	2 Bags	Placed from 83' ft	to 80' ft
Material		Amount		Placed from ft	to ft
BACKFILL (dry hole only) Material				Placed from ft	to ft
WELL SHROUD	6" x 6" Tublar Steel with 8" thick concrete collar - 3.83' above the ground surface				ft

DEPTH TO WATER, ft.	Date	11/11/13					
	Ft	86.7					

WELL LOG

Depth (ft)	Sample# Cuttings	Sample# Water	Material Description
Ground Surface	GS	GS	Ground Surface
10'			(SC) Clayey Sand, Fine, Trace Gravel, Grey/Brown
20'	OFMW04-S1		Sandstone Seam
30'	OFMW04-S2 OFMW04-S3		(CL) Sandy Clay, Trace Gravel, Occasional Seams of sandstone, Dark Brown/Grey
40'	OFMW04-S4 OFMW04-S5		Sandstone Seam
50'	OFMW04-S6 OFMW04-S7		
60'	OFMW04-S8 OFMW04-S9		
70'	OFMW04-S10 OFMW04-S11		
80'	OFMW04-S12 OFMW04-S13		Soft Sandstone, Grey/Brown
90'	OFMW04-S14 OFMW04-S15		Bedrock- Driller reported hitting hard rock at 95'
100'	OFMW04-S16		Bottom of drilled hole =100'

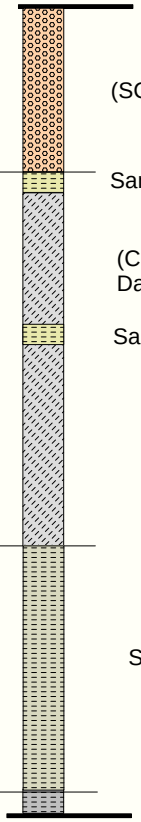


Table E.1 Outfall Area Soil Sample And Monitoring Well Location Coordinates

Point ID No.	Description	Northing	Easting	Elevation (feet)	Notes
OF-01	Soil Sample in Arroyo	1600801	2780257	7105	1
OF-02		1600854	2780432	7099	1
OF-03		1601101	2780833	7090	2
OF-04		1601211	2780938	7084	1
OF-05		1601210	2780942	7095	2
OF-06		1601419	2780968	7086	1
OF-07		1601660	2781047	7086	1
Outfall		1601020	2780747	7088	4
OFMW-01	Soil Boring	1600833	2780476	7108	5
OFMW-02	Monitoring Wells	1601073	2780925	7110	6
OFMW-03		1601250	2781000	7102	6
OFMW-04		1601914	2781403	7105	6
SLSP -01	Soil Sample in San Lucas Sediment Pond	1612626	2783429	6951	3
SLSP-02		1612772	2783457	6953	3
SLSP -03		1612912	2783602	6951	3

Notes:

1. Samples collected from the thalweg of the flow channel.
2. Sample collected from ledge above the flow channel about 5-6 feet up from the thalweg.
3. Sample collected 6 to 12 inches below the ground surface
4. The “Outfall” location is the thalweg of the arroyo where the pipe.
5. No water was encountered and no well installed. Elevation is the ground surface.
6. The elevations and coordinates of the monitoring wells are at the top of the steel well cap.

Coordinates in NAD 83 New Mexico West using a TOPCON GRS-1 hand-held GPS

Hand Auger test holes (OF-01 to OF-07) to 4’ depth

Hand Auger test holes (SLSP-01, SLSP-02 and SLSP-03) = 6 to12 inches depth.

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

November 21, 2013

Alan Kuhn

Alan Kuhn Assoc LLC
13212 Manitoba Dr NE
Albuquerque, NM 87111
TEL: (505) 350-9188
FAX

RE: RGR Outfall Monitoring Wells OrderNo.: 1311143

Dear Alan Kuhn:

Hall Environmental Analysis Laboratory received 48 sample(s) on 11/5/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order: **1311143**
Date Reported: **11/21/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells
Lab Order: 1311143

Lab ID: 1311143-001 **Collection Date:** 10/28/2013 10:25:00 AM
Client Sample ID: OFMW-01-S1 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	2.8	9.9		mg/Kg	2	11/13/2013 8:11:25 AM	10268

Lab ID: 1311143-002 **Collection Date:** 10/28/2013 10:35:00 AM
Client Sample ID: OFMW-01-S2 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	2.8	9.9		mg/Kg	2	11/13/2013 8:24:49 AM	10268

Lab ID: 1311143-003 **Collection Date:** 10/28/2013 10:40:00 AM
Client Sample ID: OFMW-01-S3 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	2.7	9.6		mg/Kg	2	11/13/2013 8:35:30 AM	10268

Lab ID: 1311143-004 **Collection Date:** 10/28/2013 10:50:00 AM
Client Sample ID: OFMW-01-S4 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	2.8	9.9		mg/Kg	2	11/13/2013 8:40:02 AM	10268

Lab ID: 1311143-005 **Collection Date:** 10/28/2013 11:10:00 AM
Client Sample ID: OFMW-01-S5 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	2.8	9.9		mg/Kg	2	11/13/2013 8:44:34 AM	10268

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
E	Value above quantitation range
J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2 for VOA and TOC only.
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells

Lab Order: 1311143

Lab ID: 1311143-006 **Collection Date:** 10/28/2013 11:30:00 AM
Client Sample ID: OFMW-01-S6 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	6.9	24		mg/Kg	5	11/13/2013 8:51:16 AM	10268

Lab ID: 1311143-007 **Collection Date:** 10/28/2013 12:40:00 PM
Client Sample ID: OFMW-01-S7 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.0	25		mg/Kg	5	11/13/2013 9:02:17 AM	10268

Lab ID: 1311143-008 **Collection Date:** 10/28/2013 12:45:00 PM
Client Sample ID: OFMW-01-S8 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.0	25		mg/Kg	5	11/13/2013 9:06:45 AM	10268

Lab ID: 1311143-009 **Collection Date:** 10/28/2013 1:05:00 PM
Client Sample ID: OFMW-01-S9 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	11/13/2013 9:11:17 AM	10268

Lab ID: 1311143-010 **Collection Date:** 10/28/2013 1:10:00 PM
Client Sample ID: OFMW-01-S10 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	11/13/2013 9:15:43 AM	10268

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells

Lab Order: 1311143

Lab ID: 1311143-011 **Collection Date:** 10/28/2013 3:30:00 PM
Client Sample ID: OFMW-02-S1 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	2.8	9.8		mg/Kg	2	11/13/2013 9:17:58 AM	10268

Lab ID: 1311143-012 **Collection Date:** 10/28/2013 3:40:00 PM
Client Sample ID: OFMW-02-S2 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	6.9	24		mg/Kg	5	11/13/2013 9:32:12 AM	10268

Lab ID: 1311143-013 **Collection Date:** 10/28/2013 3:45:00 PM
Client Sample ID: OFMW-02-S3 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	6.9	24		mg/Kg	5	11/13/2013 9:36:54 AM	10268

Lab ID: 1311143-014 **Collection Date:** 10/28/2013 3:48:00 PM
Client Sample ID: OFMW-02-S4 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	27	96		mg/Kg	20	11/14/2013 12:46:59 PM	10268

Lab ID: 1311143-015 **Collection Date:** 10/28/2013 3:50:00 PM
Client Sample ID: OFMW-02-S5 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	6.8	24		mg/Kg	5	11/13/2013 9:46:03 AM	10268

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
E	Value above quantitation range
J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2 for VOA and TOC only.
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells

Lab Order: 1311143

Lab ID: 1311143-016 **Collection Date:** 10/28/2013 3:55:00 PM
Client Sample ID: OFMW-02-S6 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	6.8	24		mg/Kg	5	11/13/2013 9:50:26 AM	10268

Lab ID: 1311143-017 **Collection Date:** 10/28/2013 4:00:00 PM
Client Sample ID: OFMW-02-S7 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.0	25		mg/Kg	5	11/13/2013 10:01:16 AM	10268

Lab ID: 1311143-018 **Collection Date:** 10/28/2013 4:05:00 PM
Client Sample ID: OFMW-02-S8 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	6.9	24		mg/Kg	5	11/14/2013 12:51:27 PM	10309

Lab ID: 1311143-019 **Collection Date:** 10/28/2013 4:10:00 PM
Client Sample ID: OFMW-02-S9 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	14	48		mg/Kg	10	11/14/2013 5:01:13 PM	10309

Lab ID: 1311143-020 **Collection Date:** 10/28/2013 4:20:00 PM
Client Sample ID: OFMW-02-S10 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	7.1	25		mg/Kg	5	11/14/2013 1:13:42 PM	10309

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

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CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells

Lab Order: 1311143

Lab ID: 1311143-021 **Collection Date:** 10/28/2013 4:40:00 PM
Client Sample ID: OFMW-02-S11 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	6.8	24		mg/Kg	5	11/14/2013 1:18:22 PM	10309

Lab ID: 1311143-022 **Collection Date:** 10/29/2013 10:30:00 AM
Client Sample ID: OFMW-03-S1 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	6.8	24		mg/Kg	5	11/14/2013 1:22:44 PM	10309

Lab ID: 1311143-023 **Collection Date:** 10/29/2013 10:35:00 AM
Client Sample ID: OFMW-03-S2 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	2.7	9.6		mg/Kg	2	11/14/2013 1:24:52 PM	10309

Lab ID: 1311143-024 **Collection Date:** 10/29/2013 10:40:00 AM
Client Sample ID: OFMW-03-S3 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	6.9	24		mg/Kg	5	11/19/2013 4:12:05 PM	10309

Lab ID: 1311143-025 **Collection Date:** 10/29/2013 11:00:00 AM
Client Sample ID: OFMW-03-S4 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	6.8	24		mg/Kg	5	11/14/2013 1:51:19 PM	10309

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells

Lab Order: 1311143

Lab ID: 1311143-026 **Collection Date:** 10/29/2013 11:10:00 AM
Client Sample ID: OFMW-03-S5 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	2.8	10		mg/Kg	2	11/14/2013 1:53:34 PM	10309

Lab ID: 1311143-027 **Collection Date:** 10/29/2013 11:30:00 AM
Client Sample ID: OFMW-03-S6 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	6.8	24		mg/Kg	5	11/14/2013 2:06:36 PM	10309

Lab ID: 1311143-028 **Collection Date:** 10/29/2013 11:40:00 AM
Client Sample ID: OFMW-03-S7 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	7.0	25		mg/Kg	5	11/14/2013 2:11:02 PM	10309

Lab ID: 1311143-029 **Collection Date:** 10/29/2013 12:00:00 PM
Client Sample ID: OFMW-03-S8 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	6.8	24		mg/Kg	5	11/14/2013 2:15:31 PM	10309

Lab ID: 1311143-030 **Collection Date:** 10/29/2013 12:05:00 PM
Client Sample ID: OFMW-03-S9 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	6.9	24		mg/Kg	5	11/14/2013 2:19:49 PM	10309

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells

Lab Order: 1311143

Lab ID: 1311143-031 **Collection Date:** 10/29/2013 12:10:00 PM
Client Sample ID: OFMW-03-S10 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	7.0	25		mg/Kg	5	11/14/2013 2:24:10 PM	10309

Lab ID: 1311143-032 **Collection Date:** 10/29/2013 12:30:00 PM
Client Sample ID: OFMW-03-S11 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	7.1	25		mg/Kg	5	11/14/2013 2:35:08 PM	10309

Lab ID: 1311143-033 **Collection Date:** 10/29/2013 4:10:00 PM
Client Sample ID: OFMW-04-S1 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	8.6	6.9	24	J	mg/Kg	5	11/14/2013 2:39:35 PM	10309

Lab ID: 1311143-034 **Collection Date:** 10/29/2013 4:12:00 PM
Client Sample ID: OFMW-04-S2 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	8.8	7.0	25	J	mg/Kg	5	11/14/2013 2:43:54 PM	10309

Lab ID: 1311143-035 **Collection Date:** 10/29/2013 4:20:00 PM
Client Sample ID: OFMW-04-S3 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	9.9	7.0	25	J	mg/Kg	5	11/14/2013 2:48:10 PM	10309

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells

Lab Order: 1311143

Lab ID: 1311143-036 **Collection Date:** 10/29/2013 4:30:00 PM
Client Sample ID: OFMW-04-S4 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	14	48		mg/Kg	10	11/14/2013 5:06:13 PM	10309

Lab ID: 1311143-037 **Collection Date:** 10/29/2013 4:40:00 PM
Client Sample ID: OFMW-04-S5 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	8.6	6.9	24	J	mg/Kg	5	11/14/2013 3:03:07 PM	10309

Lab ID: 1311143-038 **Collection Date:** 10/29/2013 4:50:00 PM
Client Sample ID: OFMW-04-S6 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	10	7.0	25	J	mg/Kg	5	11/14/2013 3:07:26 PM	10310

Lab ID: 1311143-039 **Collection Date:** 10/29/2013 4:55:00 PM
Client Sample ID: OFMW-04-S7 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	9.6	7.0	25	J	mg/Kg	5	11/14/2013 3:11:45 PM	10310

Lab ID: 1311143-040 **Collection Date:** 10/29/2013 5:00:00 PM
Client Sample ID: OFMW-04-S8 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	3.4	2.8	9.9	J	mg/Kg	2	11/14/2013 3:13:56 PM	10310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells

Lab Order: 1311143

Lab ID: 1311143-041 **Collection Date:** 10/30/2013 10:40:00 AM
Client Sample ID: OFMW-04-S9 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	12	7.0	25	J	mg/Kg	5	11/14/2013 3:20:23 PM	10310

Lab ID: 1311143-042 **Collection Date:** 10/30/2013 10:50:00 AM
Client Sample ID: OFMW-04-S10 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	14	6.9	24	J	mg/Kg	5	11/14/2013 3:31:13 PM	10310

Lab ID: 1311143-043 **Collection Date:** 10/30/2013 11:00:00 AM
Client Sample ID: OFMW-04-S11 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	9.1	6.9	24	J	mg/Kg	5	11/14/2013 3:35:26 PM	10310

Lab ID: 1311143-044 **Collection Date:** 10/30/2013 11:10:00 AM
Client Sample ID: OFMW-04-S12 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	6.8	24		mg/Kg	5	11/14/2013 3:39:43 PM	10310

Lab ID: 1311143-045 **Collection Date:** 10/30/2013 11:25:00 AM
Client Sample ID: OFMW-04-S13 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	7.9	6.8	24	J	mg/Kg	5	11/14/2013 3:43:58 PM	10310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR Outfall Monitoring Wells

Lab Order: 1311143

Lab ID: 1311143-046 **Collection Date:** 10/30/2013 11:35:00 AM
Client Sample ID: OFMW-04-S14 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	2.7	9.6		mg/Kg	2	11/14/2013 3:46:05 PM	10310

Lab ID: 1311143-047 **Collection Date:** 10/30/2013 11:40:00 AM
Client Sample ID: OFMW-04-S15 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	2.8	9.7		mg/Kg	2	11/14/2013 4:51:44 PM	10310

Lab ID: 1311143-048 **Collection Date:** 10/30/2013 11:50:00 AM
Client Sample ID: OFMW-04-S16 **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **JLF**	
Uranium	ND	2.8	10		mg/Kg	2	11/14/2013 4:56:31 PM	10310

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
E	Value above quantitation range
J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2 for VOA and TOC only.
RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1311143**

21-Nov-13

Client: Alan Kuhn Assoc LLC

Project: RGR Outfall Monitoring Wells

Sample ID	**MB-10268**	SampType:	**MBLK**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**PBS**	Batch ID:	**10268**		RunNo:	**14762**				
Prep Date:	**11/11/2013**	Analysis Date:	**11/13/2013**		SeqNo:	**425012**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	ND	5.0								

Sample ID	**LCS-10268**	SampType:	**LCS**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**LCSS**	Batch ID:	**10268**		RunNo:	**14762**				
Prep Date:	**11/11/2013**	Analysis Date:	**11/13/2013**		SeqNo:	**425013**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	24	5.0	25.00	0	97.3	80	120			

Sample ID	**1311143-001AMS**	SampType:	**MS**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**OFMW-01-S1**	Batch ID:	**10268**		RunNo:	**14762**				
Prep Date:	**11/11/2013**	Analysis Date:	**11/13/2013**		SeqNo:	**425046**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	23	9.7	24.35	0	95.4	75	125			

Sample ID	**1311143-001AMSD**	SampType:	**MSD**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**OFMW-01-S1**	Batch ID:	**10268**		RunNo:	**14762**				
Prep Date:	**11/11/2013**	Analysis Date:	**11/13/2013**		SeqNo:	**425047**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	24	9.9	24.65	0	96.4	75	125	2.30	20	

Sample ID	**MB-10309**	SampType:	**MBLK**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**PBS**	Batch ID:	**10309**		RunNo:	**14816**				
Prep Date:	**11/13/2013**	Analysis Date:	**11/14/2013**		SeqNo:	**426832**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	ND	5.0								

Sample ID	**LCS-10309**	SampType:	**LCS**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**LCSS**	Batch ID:	**10309**		RunNo:	**14816**				
Prep Date:	**11/13/2013**	Analysis Date:	**11/14/2013**		SeqNo:	**426833**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	25	5.0	25.00	0	100	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1311143**

21-Nov-13

Client: Alan Kuhn Assoc LLC

Project: RGR Outfall Monitoring Wells

Sample ID	**MB-10310**	SampType:	**MBLK**		TestCode:	**EPA Method 6010B: Soil Metals**					
Client ID:	**PBS**	Batch ID:	**10310**		RunNo:	**14816**					
Prep Date:	**11/13/2013**	Analysis Date:	**11/14/2013**		SeqNo:	**426834**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Uranium	ND	5.0									

Sample ID	**LCS-10310**	SampType:	**LCS**		TestCode:	**EPA Method 6010B: Soil Metals**					
Client ID:	**LCSS**	Batch ID:	**10310**		RunNo:	**14816**					
Prep Date:	**11/13/2013**	Analysis Date:	**11/14/2013**		SeqNo:	**426835**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Uranium	24	5.0	25.00	0	97.8	80	120				

Sample ID	**1311143-024AMS**	SampType:	**MS**		TestCode:	**EPA Method 6010B: Soil Metals**					
Client ID:	**OFMW-03-S3**	Batch ID:	**10309**		RunNo:	**14900**					
Prep Date:	**11/13/2013**	Analysis Date:	**11/19/2013**		SeqNo:	**429914**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Uranium	23	24	24.15	0	94.9	75	125			J	

Sample ID	**1311143-024AMSD**	SampType:	**MSD**		TestCode:	**EPA Method 6010B: Soil Metals**					
Client ID:	**OFMW-03-S3**	Batch ID:	**10309**		RunNo:	**14900**					
Prep Date:	**11/13/2013**	Analysis Date:	**11/19/2013**		SeqNo:	**429915**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Uranium	24	24	24.41	0	96.8	75	125	3.02	20	J	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

ENVIRONMENTAL ANALYSIS LABORATORY

4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: ALAN KUHN ASSOC LLC Work Order Number: 1311143 RcptNo: 1

Received by/date: 11/05/13

Logged By: Lindsay Mangin 11/5/2013 12:06:00 PM

Completed By: Lindsay Mangin 11/5/2013 2:27:48 PM

Reviewed By: 11/06/13

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☐ No ☑ NA ☐

Approved by client.

5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐

Approved by client.

6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	21.6	Good	Not Present			

Chain-of-Custody Record

Client: ALAN KUHN

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☐ Rush _____

Project Name: RGR OUTFALL monitoring wells

Project #:

Project Manager: ALAN KUHN
ED COESCHEN

Sampler: Screen from Drill cuttings

On Ice: ☐ Yes ☐ No

Sample Temperature: 21.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

2013 Date collected	Time	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1311143	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Organics (11/05/13)				
10-28	10:25	10'-15'	OFMW-01-S1	JAR		-001												X				
10-28	10:35	15'-20'	OFMW-01-S2	JAR		-002												X				
10-28	10:40	20-25'	OFMW-01-S3	JAR		-003												X				
10-28	10:50	25'-30'	OFMW-01-S4	JAR		-004												X				
10-28	11:10	30-35'	OFMW-01-S5	JAR		-005												X				
10-28	11:30	35-40'	OFMW-01-S6	JAR		-006												X				
10-28	12:40	40'-45'	OFMW-01-S7	JAR		-007												X				
10-28	12:45	50-55'	OFMW-01-S8	JAR		-008												X				
10-28	1:05	55-60'	OFMW-01-S9	JAR		-009												X				
10-28	1:10	60'-65'	OFMW-01-S10	JAR		-010												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
11-5-13	12:00			11/05/13	1200
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
Samples collected from Drill cuttings -

Chain-of-Custody Record

Client: ALAN KUHN

Mailing Address:

Phone #: 505 350 - 9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn Around Time:
☐ Standard ☐ Rush _____

Project Name: RGR OUTFALL monitoring wells

Project #:

Project Manager: ALAN KUHN ED Loescher

Sampler: Screen from Drill cuttings

On Ice: ☐ Yes ☒ No

Sample Temperature: 21.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

2013 Date Collected	Time	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1311143	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Uranium 11/05/13				Air Bubbles (Y or N)
10-28	3:30	30'-35'	OFMW-02-S1	JAR		-011												X				
10-28	3:45	35'-40'	OFMW-02-S2	JAR		-012												X				
10-28	3:45	40'-45'	OFMW-02-S3	JAR		-013												X				
10-28	3:48	45'-50'	OFMW-02-S4	JAR		-014												X				
10-28	3:50	50'-55'	OFMW-02-S5	JAR		-015												X				
10-28	3:55	55-60	OFMW-02-S6	JAR		-016												X				
10-28	4:00	60-~~65~~	OFMW-02-S7	JAR		-017												X				
10-28	4:05	~~65-70~~	OFMW-02-S8	JAR		-018												X				
10-28	4:10	~~70-75~~	OFMW-02-S9	JAR		-019												X				
10-28	4:20	~~75~~-80	OFMW-02-S10	JAR		-020												X				
10-28	4:40	80-85	OFMW-02-S11	JAR		-021												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
11-5-13	12:06			11/05/13	1206
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Samples collected from Drill Cuttings

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: ALAN KUHN

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☐ Standard ☐ Rush

Project Name: MON, TOLING RGR OUTFALL WELLS

Project #:

Project Manager: ALAN KUHN

Sampler: ED COESCHEN

On Ice: ☐ Yes ☐ No

Sample Temperature: 21.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

2013 Date Collected	Time	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1311143	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	CHLORIDE	11/05/13			
10-29	10:30	20'-25'	OFMW-03-S1	JAR		-022												X				
10-29	10:35	25'-30'	OFMW-03-S2	JAR		-023												X				
10-29	10:40	30'-35'	OFMW-03-S3	JAR		-024												X				
10-29	11:00	35'-40'	OFMW-03-S4	JAR		-025												X				
10-29	11:10	40-45	OFMW-03-S5	JAR		-026												X				
10-29	11:30	45-50	OFMW-03-S6	JAR		-027												X				
10-29	11:40	50-55	OFMW-03-S7	JAR		-028												X				
10-29	12:00	55-60	OFMW-03-S8	JAR		-029												X				
10-29	12:05	60-65	OFMW-03-S9	JAR		-030												X				
10-29	12:10	65-70	OFMW-03-S10	JAR		-031												X				
10-29	12:30	70-75	OFMW-03-S11	JAR		-032												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
11-5-13	12:00			11/05	1206	Samples collected from Drill cuttings
Date:	Time:	Relinquished by:	Received by:	Date	Time	

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: ALAN KUHN

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time:
☐ Standard ☐ Rush

Project Name: RGR OUTFALL MONITORING WELLS

Project #:

Project Manager: ALAN KUHN

Sampler: ED LOESCHER

On Ice: ☐ Yes ☑ No

Sample Temperature: 21.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

2013 Date collected	Time	Depth ~~Matrix~~	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1311143	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride	11/5/13
10-29	4:10	20-25	OF MW-04-S1	JAR		-033												X	
10-29	4:12	25-30	OF MW-04-S2	JAR		-034												X	
10-29	4:20	30-35	OF MW-04-S3	JAR		-035												X	
10-29	4:30	35-40	OF MW-04-S4	JAR		-036												X	
10-29	4:40	40-45	OF MW-04-S5	JAR		-037												X	
10-29	4:50	45-50	OF MW04-S6	JAR		-038												X	
10-29	4:55	50-55	OF MW-04-S7	JAR		-039												X	
10-29	5:00	55-60	OF MW 04-S8	JAR		-040												X	
10-30	10:40	60-65	OF MW 04-S9	JAR		-041												X	
10-30	10:50	65-70	OF MW04-S10	JAR		-042												X	
10:30	11:00	70-75	OF MW 04-S11	JAR		-043												X	
10:30	11:10	75-80	OF MW 04-S12	JAR		-044												X	

Date:	Time:	Relinquished by:	Received by:	Date	Time
11-5-13	12:06			11/05/13	1704
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
samples collected from Drill cuttings
See work order

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: ALAN KUHN

Mailing Address:

Phone #: 505-350-9188
email or Fax#:
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

☐ Standard ☐ Rush
Project Name: MONITORING RGR OUTFALL wells
Project #:
Project Manager: ALAN KUHN
Sampler: ED LOESCHER
On Ice: ☐ Yes ☑ No
Sample Temperature: 21.6

Date collected	Time	Depth ~~Matrix~~	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1311143
10-30	11:35	80-85	OFMW04-S13	JAR	NA	-045
10-30	11:35	85-90	OFMW04-S14	JAR	NA	-046
10-30	11:40	90-95	OFMW04-S15	JAR	NA	-047
0-30	11:50	95-100	OFMW04-S16	JAR	NA	-048

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)				Air Bubbles (Y or N)
										X	X	X		

Date:	Time:	Relinquished by:	Received by:	Date	Time
11-5-13	12:06			11/05/13	1206
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
SAMPLES COLLECTED FROM DRILL CUTTINGS

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 25, 2013

Alan Kuhn

Alan Kuhn Assoc LLC
13212 Manitoba Dr NE
Albuquerque, NM 87111
TEL: (505) 350-9188
FAX

RE: RGR-OUTFALL OrderNo.: 1310518

Dear Alan Kuhn:

Hall Environmental Analysis Laboratory received 25 sample(s) on 10/9/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order: **1310518**
Date Reported: **10/25/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR-OUTFALL
Lab Order: 1310518

Lab ID: 1310518-001 **Collection Date:** 10/8/2013 10:30:00 AM
Client Sample ID: OF-1-SS-1 6"-12" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	2.8	10		mg/Kg	2	10/22/2013 10:53:57 AM	9915

Lab ID: 1310518-002 **Collection Date:** 10/8/2013 10:35:00 AM
Client Sample ID: OF-1-SS-2 18"-24" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:39:48 PM	9915

Lab ID: 1310518-003 **Collection Date:** 10/8/2013 10:38:00 AM
Client Sample ID: OF-1-SS-3 30"-36" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:41:57 PM	9915

Lab ID: 1310518-004 **Collection Date:** 10/8/2013 10:40:00 AM
Client Sample ID: OF-1-SS-4 42"-48" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:44:12 PM	9915

Lab ID: 1310518-005 **Collection Date:** 10/8/2013 10:50:00 AM
Client Sample ID: OF-2-SS-1 6"-12" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:46:21 PM	9915

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR-OUTFALL

Lab Order: 1310518

Lab ID: 1310518-006 **Collection Date:** 10/8/2013 10:55:00 AM
Client Sample ID: OF-2-SS-2 18"-24" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:48:32 PM	9915

Lab ID: 1310518-007 **Collection Date:** 10/8/2013 10:56:00 AM
Client Sample ID: OF-2-SS-3 30"-36" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:50:36 PM	9915

Lab ID: 1310518-008 **Collection Date:** 10/8/2013 11:00:00 AM
Client Sample ID: OF-4-SS-4 42"-48" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:52:41 PM	9915

Lab ID: 1310518-009 **Collection Date:** 10/8/2013 11:10:00 AM
Client Sample ID: OF-3-SS-1 6"-12" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:54:53 PM	9915

Lab ID: 1310518-010 **Collection Date:** 10/8/2013 11:15:00 AM
Client Sample ID: OF-3-SS-2 18"-24" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:56:59 PM	9915

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR-OUTFALL

Lab Order: 1310518

Lab ID: 1310518-011 **Collection Date:** 10/8/2013 11:20:00 AM
Client Sample ID: OF-3-SS-3 30"-36" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 4:03:04 PM	9915

Lab ID: 1310518-012 **Collection Date:** 10/8/2013 11:30:00 AM
Client Sample ID: OF-4-SS-1 6"-12" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 4:05:10 PM	9915

Lab ID: 1310518-013 **Collection Date:** 10/8/2013 11:32:00 AM
Client Sample ID: OF-4-SS-2 18"-24" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 4:07:25 PM	9915

Lab ID: 1310518-014 **Collection Date:** 10/8/2013 11:50:00 AM
Client Sample ID: OF-5-SS-1 6"-12" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 4:09:38 PM	9915

Lab ID: 1310518-015 **Collection Date:** 10/8/2013 11:52:00 AM
Client Sample ID: OF-5-SS-2 18"-24" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 4:11:50 PM	9915

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR-OUTFALL

Lab Order: 1310518

Lab ID: 1310518-016 **Collection Date:** 10/8/2013 11:55:00 AM
Client Sample ID: OF-5-SS-3 30"-36" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 4:14:02 PM	9915

Lab ID: 1310518-017 **Collection Date:** 10/8/2013 11:59:00 AM
Client Sample ID: OF-5-SS-4 42"-48" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 4:16:14 PM	9915

Lab ID: 1310518-018 **Collection Date:** 10/8/2013 12:10:00 PM
Client Sample ID: OF-6-SS-1 6"-12" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:11:55 PM	9915

Lab ID: 1310518-019 **Collection Date:** 10/8/2013 12:15:00 PM
Client Sample ID: OF-6-SS-2 18"-24" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:14:10 PM	9915

Lab ID: 1310518-020 **Collection Date:** 10/8/2013 12:20:00 PM
Client Sample ID: OF-6-SS-3 30"-36" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:16:21 PM	9915

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
E	Value above quantitation range
J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2 for VOA and TOC only.
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Alan Kuhn Assoc LLC
Project: RGR-OUTFALL

Lab Order: 1310518

Lab ID: 1310518-021 **Collection Date:** 10/8/2013 12:25:00 PM
Client Sample ID: OF-6-SS-4 42"-48" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:18:29 PM	9916

Lab ID: 1310518-022 **Collection Date:** 10/8/2013 12:38:00 PM
Client Sample ID: OF-7-SS-1 6"-12" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:25:09 PM	9916

Lab ID: 1310518-023 **Collection Date:** 10/8/2013 12:40:00 PM
Client Sample ID: OF-7-SS-2 18"-24" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:27:21 PM	9916

Lab ID: 1310518-024 **Collection Date:** 10/8/2013 12:45:00 PM
Client Sample ID: OF-7-SS-3 30"-36" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	7.1	7.1	25	J	mg/Kg	5	10/22/2013 3:29:32 PM	9916

Lab ID: 1310518-025 **Collection Date:** 10/8/2013 12:46:00 PM
Client Sample ID: OF-7-SS-4 42"-48" **Matrix:** SOIL

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 6010B: SOIL METALS							Analyst: **ELS**	
Uranium	ND	7.1	25		mg/Kg	5	10/22/2013 3:38:04 PM	9916

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1310518**

25-Oct-13

Client: Alan Kuhn Assoc LLC

Project: RGR-OUTFALL

Sample ID	**MB-9916**	SampType:	**MBLK**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**PBS**	Batch ID:	**9916**		RunNo:	**14263**				
Prep Date:	**10/19/2013**	Analysis Date:	**10/22/2013**		SeqNo:	**408912**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	ND	5.0								

Sample ID	**LCS-9916**	SampType:	**LCS**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**LCSS**	Batch ID:	**9916**		RunNo:	**14263**				
Prep Date:	**10/19/2013**	Analysis Date:	**10/22/2013**		SeqNo:	**408913**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	24	5.0	25.00	0	94.2	80	120			

Sample ID	**MB-9915**	SampType:	**MBLK**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**PBS**	Batch ID:	**9915**		RunNo:	**14263**				
Prep Date:	**10/19/2013**	Analysis Date:	**10/22/2013**		SeqNo:	**408914**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	ND	5.0								

Sample ID	**LCS-9915**	SampType:	**LCS**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**LCSS**	Batch ID:	**9915**		RunNo:	**14263**				
Prep Date:	**10/19/2013**	Analysis Date:	**10/22/2013**		SeqNo:	**408915**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	26	5.0	25.00	0	102	80	120			

Sample ID	**1310518-001AMS**	SampType:	**MS**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**OF-1-SS-1 6"-12"**	Batch ID:	**9915**		RunNo:	**14263**				
Prep Date:	**10/19/2013**	Analysis Date:	**10/22/2013**		SeqNo:	**408936**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	20	10	24.37	0	83.1	75	125			

Sample ID	**1310518-001AMSD**	SampType:	**MSD**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**OF-1-SS-1 6"-12"**	Batch ID:	**9915**		RunNo:	**14263**				
Prep Date:	**10/19/2013**	Analysis Date:	**10/22/2013**		SeqNo:	**408937**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	21	10	24.79	0	82.7	75	125	1.32	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1310518**

25-Oct-13

Client: Alan Kuhn Assoc LLC

Project: RGR-OUTFALL

Sample ID	**1310518-021AMS**	SampType:	**MS**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**OF-6-SS-4 42"-48"**	Batch ID:	**9916**		RunNo:	**14263**				
Prep Date:	**10/19/2013**	Analysis Date:	**10/22/2013**		SeqNo:	**409038**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	26	25	24.69	0	104	75	125			

Sample ID	**1310518-021AMSD**	SampType:	**MSD**		TestCode:	**EPA Method 6010B: Soil Metals**				
Client ID:	**OF-6-SS-4 42"-48"**	Batch ID:	**9916**		RunNo:	**14263**				
Prep Date:	**10/19/2013**	Analysis Date:	**10/22/2013**		SeqNo:	**409039**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Uranium	26	25	24.71	0	104	75	125	0.113	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: ALAN KUHN ASSOC LLC Work Order Number: 1310518 RcptNo: 1

Received by/date: AT 10/09/13

Logged By: **Anne Thorne** 10/9/2013 12:00:00 PM Anne Thorne

Completed By: **Anne Thorne** 10/10/2013 Anne Thorne

Reviewed By: RK 10.11.13

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Client		

Log In

4. Was an attempt made to cool the samples?	Yes ☐	No ☐	NA ☑
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☐	NA ☑
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	22.6	Good	Not Present			

Chain-of-Custody Record

Client: ALAN KUHN ASSOC

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: RGR - OUTFALL

Project #: AKA - HEAL 1

Project Manager: ALAN KUHN

Sampler:

On Ice: ☐ Yes ☒ No

Sample Temperature: 22.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time AM	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1310518	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Total 11				Air Bubbles (Y or N)
10/8/13	10:30 AM	6"-12"	OF-1-SS-1	JAR	NONE	-001												X				
10/8/13	10:35	18"-24"	OF-1-SS-2	JAR	NONE	-002																
10/8/13	10:38	30"-36"	OF-1-SS-3	JAR	NONE	-003																
10/8/13	10:40	42"-48"	OF-1-SS-4	JAR	NONE	-004																
10/8/13	10:50	6"-12"	OF-2-SS-1	JAR	NONE	-005																
10/8/13	10:55	18"-24"	OF-2-SS-2	JAR	NONE	-006																
10/8/13	10:56	30"-36"	OF-2-SS-3	JAR	NONE	-007																
10/8/13	11:00	42"-48"	OF-4-SS-4	JAR	NONE	-008																
10/8/13	11:10	6"-12"	OF-3-SS-1	JAR	NONE	-009																
10/8/13	11:15	18"-24"	OF-3-SS-2	JAR	NONE	-010																
10/8/13	11:20	30"-36"	OF-3-SS-3	JAR	NONE	-011																
~~10/8/13~~																						

Date:	Time:	Relinquished by:	Received by:	Date	Time
10/9/13	12:00			10/09/13	1200
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
See WORK PLAN - ALL SAMPLES are GRAB samples from HAND Auger tip

PAGE 1 OF 3

11

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: ALAN KUHN

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

☒ Standard ☐ Rush _____

Project Name: RGR-OUTFALL

Project #:

Project Manager: ALAN KUHN

Sampler:

On Ice: ☐ Yes ☒ No

Sample Temperature: 22.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

10/9/13

Analysis Request

Date	Time AM	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1310518	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Total LL				Air Bubbles (Y or N)
10-8-13	11:30	6"-12"	OF-4-SS-1	JAR	NONE	-012												X				
10/8/13	11:32	18"-24"	OF-4-SS-2	JAR	NONE	-013																
10/8/13	11:50	6"-12"	OF-5-SS-1	JAR	NONE	-014																
10/8/13	11:52	18"-24"	OF-5-SS-2	JAR	NONE	-015																
10/8/13	11:55	30"-36"	OF-5-SS-3	JAR	NONE	-016																
10/8/13	11:59	42"-48"	OF-5-SS-4	JAR	NONE	-017																
10/8/13	12:10	6"-12"	OF-6-SS-1	JAR	NONE	-018																
10/8/13	12:15	18"-24"	OF-6-SS-2	JAR	NONE	-019																
10/8/13	12:20	30"-36"	OF-6-SS-3	JAR	NONE	-020																
10/8/13	12:25	42"-48"	OF-6-SS-4	JAR	NONE	-021																
																		✓				

Date:	Time:	Relinquished by:	Received by:	Date	Time
10/9/13	12:00			10/9/13	7:00
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

SEE WORK PLAN - ALL SAMPLES are GRAB SAMPLES from HAND Auger tip

PAGE 2-OF 3

10

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: ALAN KUHN

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: RGR OUTFALL

Project #:

Project Manager: ALAN KUHN

Sampler:

On Ice: ☒ Yes ☐ No

Sample Temperature: 22.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

10/9/13

Analysis Request

Date	Time	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1310518	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	TOTAL				Air Bubbles (Y or N)
10/8/13	12:35	6"-12"	OF-7-SS-1	JAR	None	-022												X				
10/8/13	12:40	18"-24"	OF-7-SS-2	JAR	None	-023																
10/8/13	12:45	30"-36"	OF-7-SS-3	JAR	None	-024																
10/8/13	12:46	42"-48"	OF-7-SS-4	JAR	None	-025																

Date:	Time:	Relinquished by:	Received by:	Date	Time
10/9/13	12:00			10/09/13	1200
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

TOTAL = ~~26~~ 25 samples

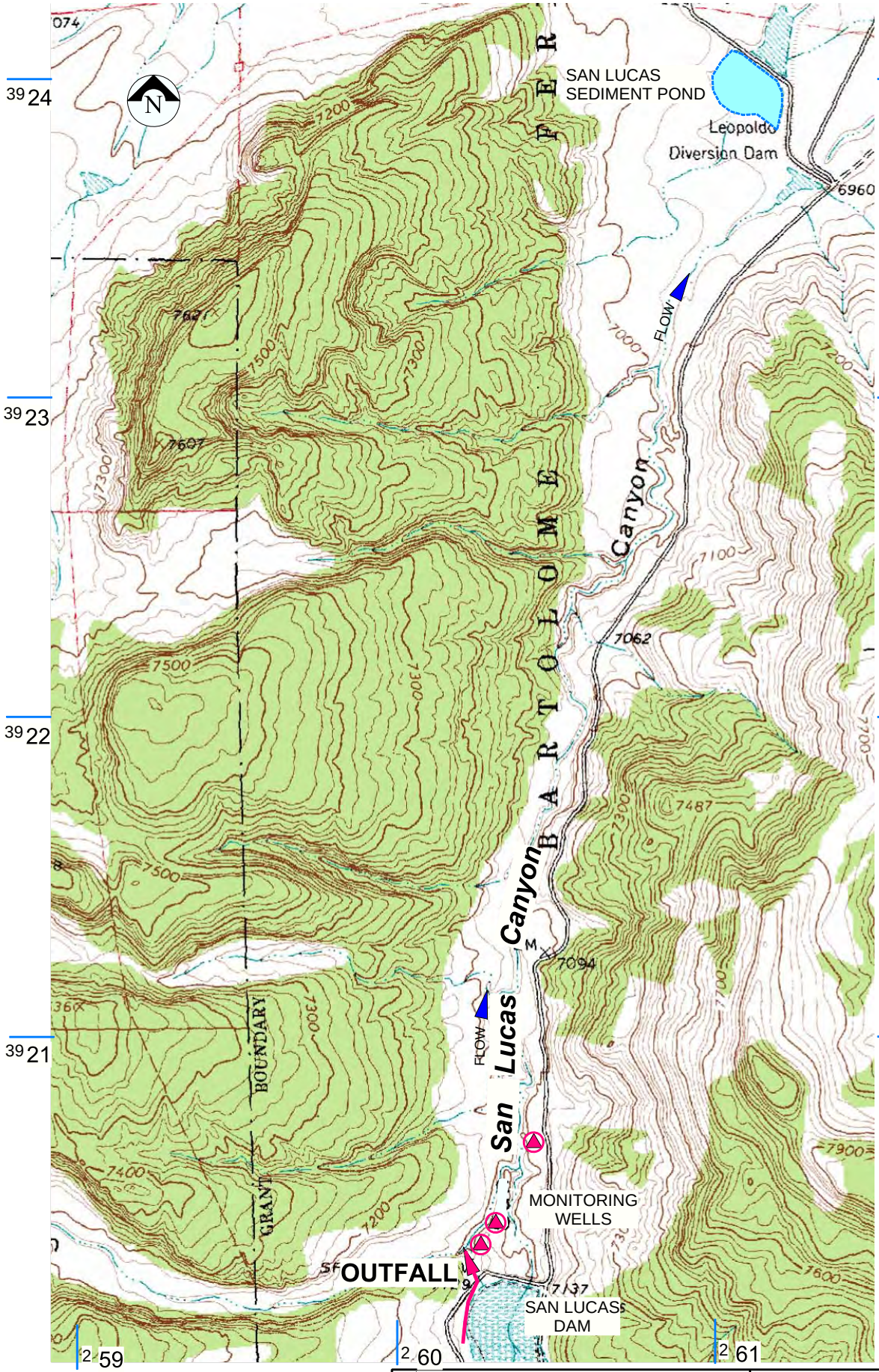
PAGE 3 of 3

See WORK PLAN

ALL SAMPLES ARE GRAB SAMPLES from HAND AUGER TIP

4

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Graphic Scale

0 ft 1000 2000 3000 4000 ft

Note: Map derived from USGS Quad Map San Lucas Dam, 1963 (revised 1980)

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC

DATE: 11/19/13

TITLE: FIGURE E-1

SAN LUCAS CANYON MAP

0 200 FT 400 FT

GRAPHIC SCALE

RIO GRANDE RESOURCES CORPORATION

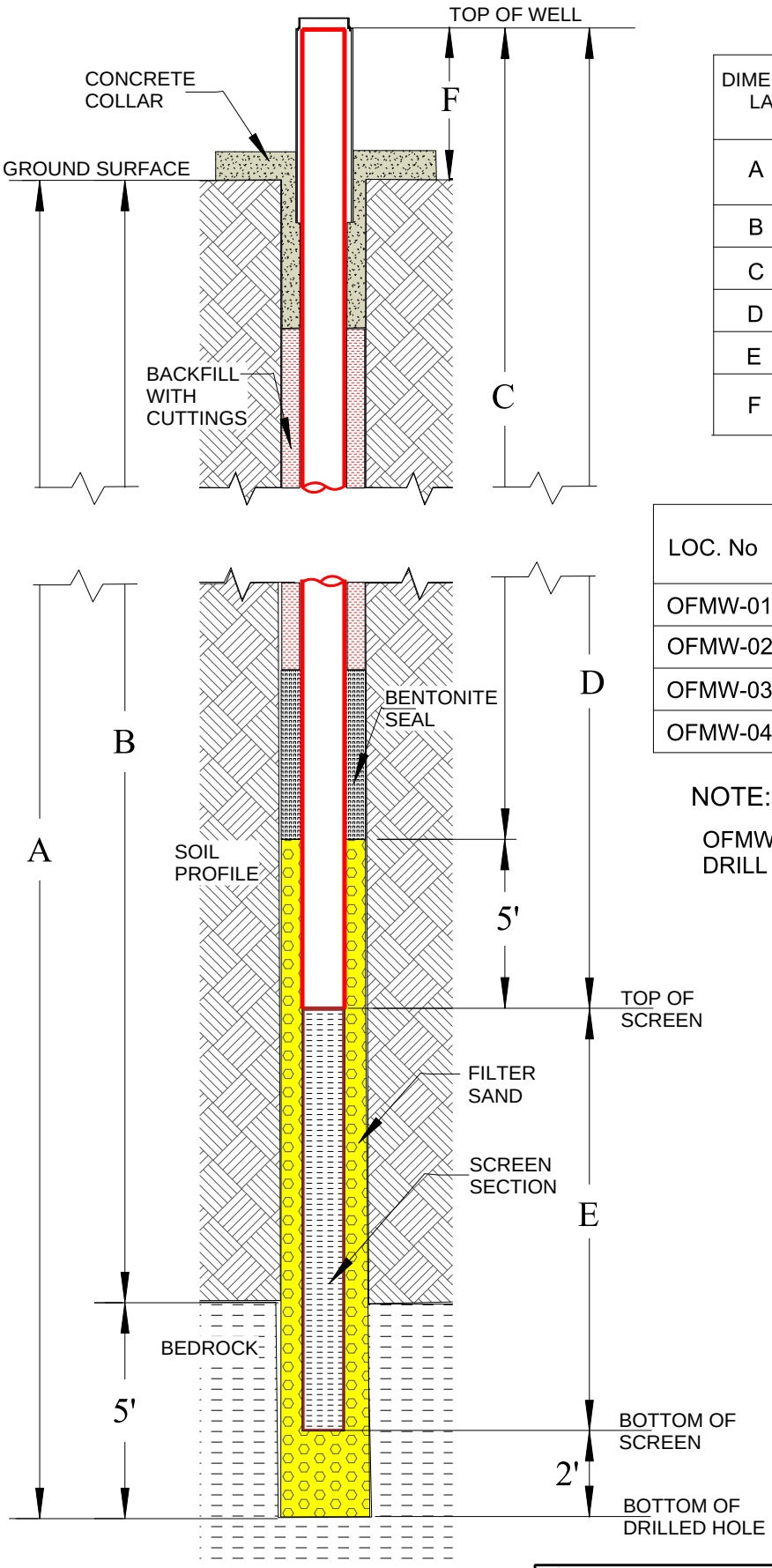
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC

DATE: 11/19/13

FIGURE E-2

OUTFALL AREA - SOIL SAMPLING AND MONITORING WELL LOCATIONS



DIMENSION LABEL	DESCRIPTION
A	TOTAL DRILL DEPTH GROUND SURFACE TO BOTTOM OF HOLE
B	GROUND SURFACE TO TOP OF BEDROCK
C	TOP OF WELL TO TOP OF FILTER SAND
D	TOP OF WELL TO TOP OF SCREEN
E	SCREEN LENGTH
F	TOP OF WELL TO GROUND SURFACE

LOC. No	A *(feet)*	B *(feet)*	C *(feet)*	D *(feet)*	E *(feet)*	F *(feet)*
OFMW-01	70	65	NA	NA	NA	NA
OFMW-02	90	85	77	82	10	3.75
OFMW-03	85	80	71	78	10	3.46
OFMW-04	100	95	87	92	10	3.83

NOTE:

OFMW-01 - NO MONITORING WELL INSTALLED. DRILL HOLE BACKFILLED WITH CUTTINGS

WELL DATA

DRILL HOLE DIAMETER = 8 INCHES

WELL CASING = 4" SCH 80 PVC

JOINTS = FLUSH

OUTFALL MONITORING WELLS INSTALLED FROM 10-28-13 THROUGH 10-30-13

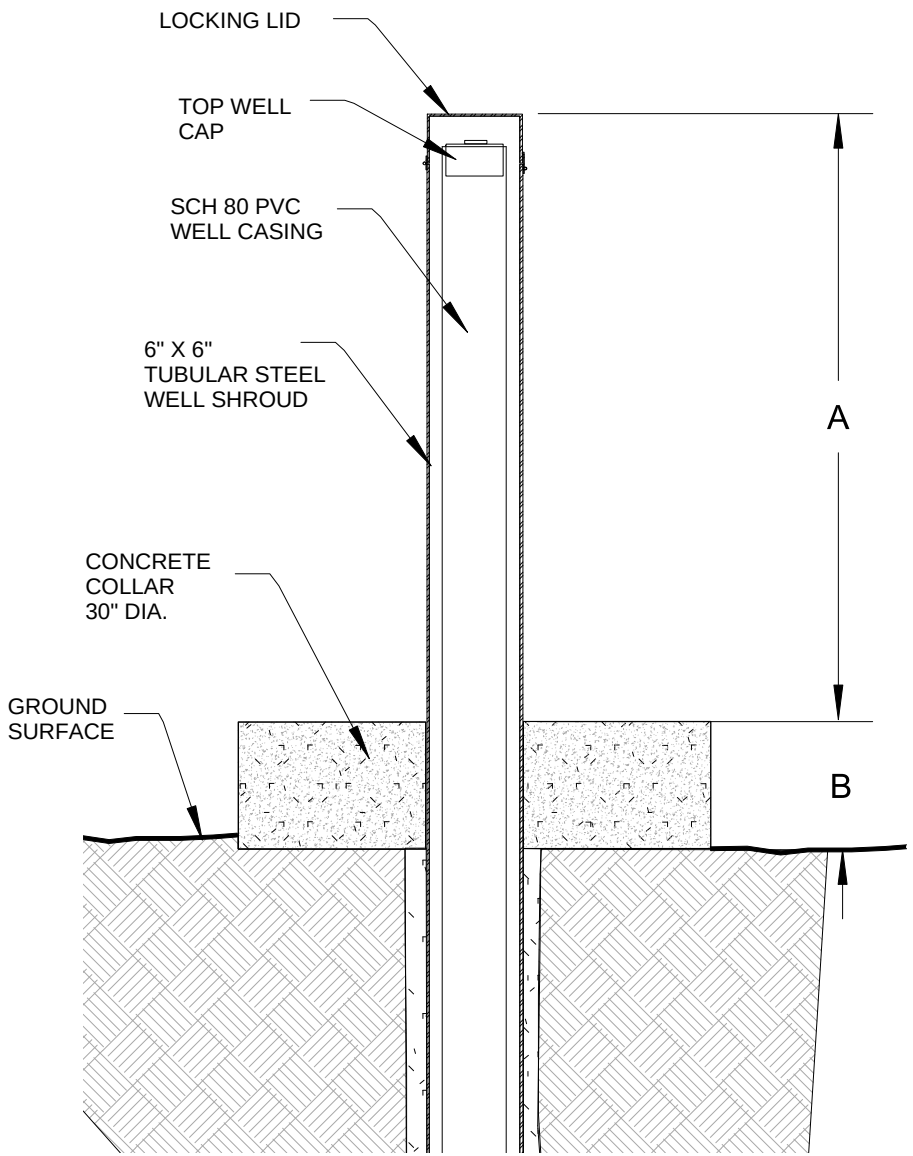
NOT TO SCALE

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC

DATE: 11/19/13

TITLE: FIGURE E-3
MONITORING WELL GRAPHIC LOGS



WELL NUMBER	DIMENSIONS	ELEVATIONS	
OFMW-01	NO WELL INSTALLED	BACKFILL DRILL HOLE WITH CUTTINGS	
		GROUND SURFACE	7107.91
OFMW-02	A = 38.0" B = 7.0"	TOP OF STEEL CASING	7110.09
		TOP OF CONCRETE	7106.92
		GROUND SURFACE	7106.34
OFMW-03	A = 33.5" B = 8.0"	TOP OF STEEL CASING	7102.28
		TOP OF CONCRETE	7099.49
		GROUND SURFACE	7098.82
OFMW-04	A = 38.0" B = 8.0"	TOP OF STEEL CASING	7104.53
		TOP OF CONCRETE	7101.36
		GROUND SURFACE	7100.70

0 1 FT 2 FT

GRAPHIC SCALE

OUTFALL MONITORING WELLS INSTALLED FROM 10-28-13 THROUGH 10-30-13

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC

DATE: 11/19/13

TITLE: FIGURE E-4
TOP OF MONITORING WELL DETAILS

LEGEND

▲ SAMPLING LOCATION

0 200 FT 400 FT

GRAPHIC SCALE

GRID =NAD 83 NM WEST

RIO GRANDE RESOURCES CORPORATION

MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC

DATE: 11/19/13

FIGURE E-5

SAN LUCAS SEDIMENT POND AREA - SOIL SAMPLING LOCATIONS

WORK PLAN

INVESTIGATION OF SOIL AND GROUND WATER FOR POSSIBLE URANIUM CONTAMINATION AT MINE WATER PIPELINE OUTFALL 001

MT. TAYLOR MINE

RIO GRANDE RESOURCES

Purpose and Scope

Rio Grande Resources (RGR) submitted an application of 4/5/2013 on the New Mexico Environment Department's Ground Water Quality Bureau Mining Act Compliance Section (MACS) for renewal and modification of its discharge permit DP-61 for the Mt. Taylor Mine. In its Request for Additional Information dated 8/2/2313 and subsequent communications, MACS expressed concerns about possible uranium concentrations in the alluvium and ground water in the San Lucas canyon arroyo where the mine water pipeline discharges at outfall 001. In response to MACS concerns, RGR has prepared this work plan to conduct field and laboratory investigations to determine:

1. The existence of ground water in the alluvium at Outfall 001.
2. If ground water is present in the alluvium, the uranium concentration in the ground water, both upstream and downstream of the outfall.
3. The concentration of uranium in the alluvium, both upstream and downstream of the outfall.
4. The leachability of uranium in the alluvium, if uranium in the downstream alluvium is above background, as established by upstream alluvium uranium concentrations.

The investigation will consist of sampling and testing alluvial soil from the arroyo channel at the outfall, drilling test borings into ground water or to bedrock at four locations on the terrace above the arroyo channel, and installing monitoring wells in the test borings. Soil samples and ground water will be tested for uranium concentration. Soils with uranium concentrations above background, if any, will be tested for uranium leachability.

Soil Sampling and Testing

RGR will collect soil samples to be tested for uranium concentrations. Uranium is the only contaminant contained in the pre-1990 mine water discharge that exceeds current 20.6.2.3103 NMAC standards. Samples of alluvial soil will be collected both upstream (background) and downstream (potentially impacted) of outfall 001 in the bottom of the arroyo at locations shown on Figure RGR RAI-3.2. Alluvial soil samples will be collected from elevations deeper than the arroyo channel during drilling of the four test borings. Soils above this elevation would not have been impacted by the pre-1990 mine water discharge. These samples of drill cuttings will be collected in 5-ft. intervals, logged by an RGR

representative, packaged in durable plastic bags or jars, recorded on a Chain of Custody form, and delivered to a qualified analytical chemistry laboratory for testing for total U concentration using EPA Method 6010.

Alluvial soil samples will be collected from six locations in the arroyo channel, two upstream and four downstream of the outfall. The upstream sampling location will provide soil samples for background uranium concentrations. Sample collection methods are constrained by the narrow deep arroyo that is heavy vegetated with salt cedar in some locations. These conditions make access very difficult. Consequently, a truck-mounted drill or even a track-mounted Geoprobe will not be able to access all sampling locations in the arroyo channel. RGR will use a Case skid-steer tractor with both a front end bucket and auger to clear a path through the vegetation and to obtain soil samples where possible. Otherwise, RGR will employ a manually operated power auger. The sample hole will be advanced with the auger to each sample depth, where up to 500 grams of sample will be taken from the auger or by hand tools with a sand auger (AMS model 350.40 or equivalent), double-bagged in plastic, sealed with duct tape and labeled. Samples will be collected in the arroyo channel from ground surface to 40-48 inches depth, the operating limit for the auger, at 1.0 foot intervals. Each sample will be tested in a qualified analytical chemistry laboratory for total U concentration using EPA Method 6010.

Sampling locations are shown on Figure RGR RAI-3.2.

If U concentrations in soil downstream indicate U contamination above background from the pre-1990 mine water discharge, leaching tests will be performed using Synthetic Precipitation Leaching Procedure (SPLP), EPA Method 1312 to estimate how much U could be re-mobilized by the clean mine discharge water. If the leachate is above the 0.03 mg/l U limit, ground water sampling and testing for U concentrations monitoring wells will be included in the Mine Plan of Operations, to be prepared prior to resumption of mine dewatering.

Ground Water Sampling and Monitoring

Four test holes will be drilled at locations shown on Figure RGR RAI-3.2. As described above, soils below the elevation of the arroyo channel will be sampled from the drill cutting in these four test holes. Monitoring wells will be installed in these test borings, but if no water is encountered during drilling at the upstream test boring location (#1 on Figure RGR RAI-3.2), no monitoring well will be installed there. Otherwise, the #1 monitoring well will be a background well. Test boring #1 will be located on the alluvial terrace as far upstream as the constraints of terrain and drilling equipment will allow.

RGR will perform the test borings and install the monitoring wells using a drilling contractor who will mobilize:

1) a drill rig capable of air-rotary or auger drilling through unsaturated soil to depths of at least 200 feet,

2) an air compressor with sufficient CFM to support the drilling if air rotary is used, and

3) other support vehicles and equipment as required for #1 and #2.

The contractor will remove all equipment, trash, and other waste material from the work site at completion of the following work. Excess drill cutting not used in hole backfill will be evenly distributed around the site.

Drilling

The contractor will drill to ground water or top of rock, whichever is reached first. The driller will capture cuttings in five-foot intervals and place them on a table or tarp for logging and sample collection/packaging by a Rio Grande Resources (RGR) representative. The RGR representative will be a geologist or engineer experienced in drilling for environmental and engineering investigations. The representative will prepare a graphic log of each test boring containing a record of start and completion times, drilling methods and equipment, weather conditions, materials encountered, depths of each stratum, moisture conditions, and depth to ground water.

If ground water is encountered within 100 feet depth, the driller will note the depth to the top of water, and then continue drilling to 10 feet below ground water level.

If rock is encountered within 10 feet below ground water level, the driller shall note the depth to top of rock, and then continue drilling to 10 feet below ground water level or to five feet into rock, whichever is less. If the rock hardness prevents advance to these depths, the depth of refusal will be recorded.

If ground water is not encountered above the top of rock, the driller will continue drilling 5 feet into rock or refusal. If no water is encountered in drill hole #1, the hole shall be immediately backfilled with drill cuttings.

If neither ground water nor top of rock is encountered in 100 feet, RGR's representative will advise the driller on how much deeper to drill, but in no case more than 200 feet total depth.

The driller may switch to drilling with water or mud if the drill hole becomes unstable using augers or air as the drill fluid.

Monitoring Wells

Each monitoring well will be installed in accordance with the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) *Monitoring Well Construction and Abandonment Guidelines*. The contractor will install monitoring wells using the following materials:

Sch 80 PVC casing, nominal 4 inch diameter, Certainteed Certa-Lok or approved equal

Sch. 80 PVC cap, for 4 inch diameter casing

Sch. 80 PVC cap, for bottom of 4 inch diameter slotted casing

Sch 80 PVC slotted casing, 0.010 inch factory-cut slots and two centralizers, 10 ft. sections

Filter pack sand; clean medium to coarse

Bentonite pellets, 3/8 inch or smaller

Steel well shroud guard pipe, min. 6 inches ID, min. 5 ft. long, with locking cap

Rapid-Set concrete

In each monitoring well, the 10 ft. slotted screen section will be placed in the bottom 10 feet of the alluvial column. For test borings penetrating rock, the rock section will be backfilled with cuttings before setting the well casing. However, if the bottom of the test hole is less than 10 feet below the static water level, the screen section will be set to the bottom of the test hole without first backfilling the rock section.

Each well shall be completed and developed according to the GWQB guidelines. Well development will continue until the well water is free of visible sediment.

Monitoring Well Sampling

Monitoring wells will be sampled initially as soon as possible after well development, following procedures consistent with U.S. Environmental Protection Agency, EPA/540/S-95/504, and the water samples will be tested for uranium concentration using EPA Method 200.8 for inductively coupled plasma mass spectrometry (ICP-MS). If U concentrations in wells #2, 3, or 4 exceed 0.03 mg/l in this initial sampling and the background well (#1) water is lower in U concentration, the ground water downstream (wells #2, 3, and/or 4) will be sampled on a schedule to be included in the Mine Plan of Operations (MPO). If alluvial soil samples show levels of total uranium that exceed 0.03 mg/l in the test leachate, the well(s) downstream of that soil sample location will be sampled during mine operations (per the MPO) to ascertain what mobilization of uranium has occurred as a result of mine water discharge at Outfall 001.

The schedule for future sampling and testing of ground water in these wells during mine water discharge will depend on which ground water condition exists and whether leachable alluvial soil U concentrations would exceed 0.03 mg/l.

At each sampling event, depth to ground water will be measured and recorded before the sampling procedure begins.

Period of Performance

NMED approval of this SCOPE is required before starting the work. Submittal for NMED approval is expected by 9/18/13, with approval to proceed within three weeks. Mobilization and start of work is expected by 10/18/13. Completion of work is anticipated two weeks after mobilization.

Documentation and Reporting

The execution of this work plan will be documented as the work is performed, and Report of Outfall Area Investigations will be prepared and submitted within 30 days of completion of the initial water sampling and testing event. Documentation will include:

- This work plan and any revisions or variances to it.
- Soil sampling and test hole logs
- Soil and water sample inventories
- Tabulation of laboratory test results
- Record of well installation, development and sampling
- Narrative analysis of field and laboratory data.
- Figure(s) illustrating alluvial stratigraphy and ground water elevations and gradient
- Proposed future monitoring during mine dewatering

▼ Background soil samples

▲ Downstream soil samples

Test borings to base of alluvium

Outfall 001 Investigations
Location Map,
Rev. A 8/13/13