PINON RIDGE MINING LLC
Van 4 Mine
Technical Revision No. 1 – Reclamation Plan
Permit No. M-1997-032

Prepared for:

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Project No. 12100.05

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Western Water & Land, Inc.

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1.0 INTRODUCTION

Western Water & Land, Inc. (WWL), on behalf of Pinon Ridge Mining LLC (PRM), is submitting this Technical Revision (TR) to the Colorado Division of Reclamation, Mining and Safety (DRMS) to present proposed changes to the original Van 4 Mine (aka Van 4 Shaft) Reclamation Plan. The Van 4 Mine is a 110d mine operation and holds Permit (No. M-1997-032). The proposed changes will affect Exhibit D Reclamation Plan. Exhibit E, the Reclamation Map will not be affected. The Van 4 Mine is located in NE1/4, SW1/4, Section 29, Twp 46N, Rng 17 W, N.M P.M., approximately 10.5 aerial miles west of Naturita, Colorado in Montrose County, Colorado (see Figure 1).

This Technical Revision (TR-01) reviews applicable historical reclamation plans and presents several proposed changes to those plans for the Van 4 Mine. The original Reclamation Plan (Exhibit D) was prepared in 1997 during initial mine permitting and is provided in Attachment A. An original Reclamation Plan map (Exhibit E) was prepared by Energy Fuels Nuclear, Inc. in August, 1998 and is shown as Figure 2 in this report. Denison Mines (USA) Corp. (Denison) reproduced this map in June of 2009 as part of the Environmental Protection Plan (EPP).

The main revision to reclamation proposed in this TR at the Van 4 Mine, is mine shaft closure. Historical plans for closure of the production shaft and vent shaft were to involve shaft backfilling with development rock followed by a concrete plug near the surface. PRM proposes to reclaim the shafts using surface seals (or caps) in accordance with existing DRMS specifications. This method of reclamation will maintain shaft integrity and potentially enable PRM to reopen and reuse the shafts for future uranium and vanadium ore production and mine ventilation.

The purpose of this TR is to provide an updated comprehensive Reclamation Plan for the Van 4 Mine. The text describes additional details related to site regrading and revegetation, and shaft closure. No new acreage will be disturbed at the mine site during reclamation activities.

This TR presents background information and project rationale in Section 2.0, Site Description information in Section 3.0, and reclamation methods in Section 4.0.

Operator Information

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2.0 BACKGROUND AND RATIONALE

Electronic documents available on the DRMS (formerly Colorado Division of Mining and Geology, DMG) website show that the Union Carbide Corporation (UCC) and its subsidiary Umetco Minerals Corporation (UMC) began mining operations on Monogram Mesa in the 1970s. The Van 4 Mine production shaft and associated vent shaft were constructed in 1979 to support extraction of uranium and vanadium ores, particularly those associated with the Ura Mine, located to the southwest. Documents on the DRMS website indicate that the permitting process began in 1997 and a formal mining permit was issued for the mine to International Uranium (USA) Corporation in November, 1999.

The Van 4 Shaft was constructed as an intermediate ore hoisting facility to support mining at UMC's Ura Mine. The mine exchanged ownership numerous times and was owned by Energy Fuels Nuclear, Inc., International Uranium (USA) Corp., Denison Mines (USA) Corp., and Energy Fuels Resources (USA), Inc. Pinon Ridge Mining LLC acquired the mine in 2014 and is the current owner and operator.

The Van 4 Mine is associated with 11 claims: Van 4, 5, and 6, Rodman 4 and 5; Paris 4 and 5, and Curley 3, 4, 5, and 6. The mine permit affected area boundary falls almost entirely within the Van 4 claim and a small segment of the Van 5 and Rodman 4 claims (see Figure 3).

On February 8, 2008, Denison Mines (USA) Corp. (Denison), the operator of the Van 4 Mine at that time, received Notice of Determination of Designation Mining Operation from DRMS. The notice required that an EPP be prepared and submitted; the EPP was submitted to DRMS on June 8, 2009. The EPP was submitted as permit amendment AM-1. The AM-1 EPP document is the most recent technical submittal for the Van 4 Mine.

Temporary cessation was approved for the Van 4 Mine on March 6, 2014. PRM was approved as succession of operator in October, 2104. PRM filed for a second temporary cessation on May 30, 2017. The Mined Land Reclamation Board (Board) granted PRM's request for a second period of Temporary Cessation on August 14, 2017. By Order of the Colorado Court of Appeals dated July 25, 2019 and Order of the Denver District Court dated September 26, 2019, the matter was remanded to the Board. The Board subsequently vacated the August 14, 2017 decision, terminated the mining operation and ordered PRM to commence final reclamation immediately, to be completed within five years (March 2025).

DRMS records indicate that the permitted mine area is 8.4 acres. Figure 2 shows the main mine operations area to consist of 7.4 affected acres. The existing vent shaft, located 0.25 miles to the east, was estimated to involve 0.5 acres of disturbance, but field inspections show this area to be considerably less. The access road to the vent shaft was an existing publicly used overland track prior to construction of the vent shaft and is not part of the reclamation plan (DRMS, 1999). A second proposed vent shaft to be located further to the east was never constructed.

PRM began reclamation in March 2020 by removing siding from buildings onsite. Later, the hoist headframe was removed along with all other buildings.

This Technical Revision No. 1. addresses final reclamation activities for the Van 4 Mine.

3.0 SITE DESCRIPTION

The mine site is accessed by traveling west on Colorado State Highway 90 6.3 miles from the intersection of Colorado State Highway 141, then turning south and traveling 6.2 miles on county road EE21 to the intersection with road DD19. Turn right on road DD19 and travel 2.6 miles to the mine site. County road DD19 forms the northeast boundary of the mine operations area. The single vent shaft is located 0.25 miles east of the mine operations area on the northeast side of county road DD19.

The mine operations area is located in high desert terrain on Monogram Mesa, at an elevation of 6,900 ft above mean sea level. Topography is subdued with a gently sloped land surface to the southwest. Pinon-Juniper is the predominant plant community that includes sage, saltbush and rabbit brush and several native grass species.

The permitted mine area consists of a total of 8.4 acres. The mine operations area consists of 7.4 affected acres that include the mine access road, the development rock area, the topsoil stock pile, and associated stormwater management structures. The hoist house, change house and office, compressor station, and several small support structures have been removed, however, the concrete foundations are still present.

The project consists of final reclamation construction at the Van 4 Mine. The primary activities include structure removal, site regrading, shaft closures, and revegetation for the entire affected area. No new disturbance is expected to occur outside of the permitted affected area.

3.1 Mine Operations Structures

3.1.1 Mine Operations Area

The mine access road is a low-profile dirt track extending a few hundred feet from County Road DD19. The primary onsite structures consist of concrete pads that served as foundations for operations facilities. Pads include: 1) production shaft pad, 2) change house pad, 3) hoist pad, 4) compressor pad, and 5) vent shaft pad. The concrete pads vary in size, but are relatively small, not exceeding 900 square feet in size. The operations area pads all lie within a hundred feet or so from one another on flat terrain. The vent shaft pad is located 0.25 miles to the east (see Figure 2).

The change house and compressor station pads do not have associated metal equipment or other attachments that need special attention. No septic system was constructed on the site.

3.1.2 Production Shaft

The production shaft is collared in a concrete slab that stabilized the shaft at the surface and provided a foundation to support the weight of the headframe. The concrete pad also provided for a solid flat working surface for workers to handle materials entering and exiting the shaft. Figures 4-1 and 4-2 show schematic plan and cross section views, respectively, of the existing production shaft pad. Attachment B shows mine site photographs.

The shaft measures eight feet in diameter, has a gunite (shotcrete) lining (observed in the upper portion of the shaft), and is covered with metal grating. The headframe has been removed. The shaft contains vertical metal rails that likely facilitated ore skip conveyance, and other utilities such as power cables and associated supports. There are several concrete and metal pedestals on top of the production shaft pad.

The concrete pad that surrounds the shaft opening consists of two concrete slabs that were installed separately forming one continuous pad. There are no documents available that discuss specific construction details of the production shaft and concrete collar.

The internal slab is 16 feet square and forms a stabilizing collar around the shaft. Drill tests into this slab showed that the slab is at least two-feet thick (the soil beneath the slab was not penetrated after drilling two feet). Steel reinforcement in this slab is unknown and cannot be assessed without cutting the slab. The exterior slab extends several feet beyond the collar slab and attains a 30-foot width on the west side of the slab. An excavation on the south side of this slab showed a thickness of 6-inches. Rebar reinforcement on this slab is unknown. See Figures 4-1 and 4-2 for schematic drawings of the existing production shaft collar area.

3.1.3 Hoist Pad

The hoist house building was removed from the site some years ago. The hoist pad has a good portion of the electric hoist still in place – bolted to the concrete pad. Concrete-lined sump and collection channels are part of the pad and were used to collect any release of oil and grease, hydraulic fluids, and other oily wastes associated with operation of the hoist. The sump has collected rain water and is likely contaminated with residual oil and grease materials.

3.1.4 Vent Shaft

Similar to the production shaft, the vent shaft is also 8 ft in diameter and collared within a circular 15-ft diameter concrete slab. The shaft may be lined with gunite (shotcrete) further down shaft from the surface. Figure 5 shows schematic plan and cross section views of the existing vent shaft pad.

The concrete collar was formed by two concentric corrugated steel rings. The internal ring is still in place and is in alignment with the perimeter of the shaft. The external ring was placed four

feet outside of the internal ring. Cement was poured in the annulus. The top of the resulting concrete ring was finished at grade. The slab is 2 ft 2 in thick as determined by an excavation dug adjacent to the slab.

There are no documents available on the DRMS website that discuss specific construction details of the vent shaft. Steel reinforcement in this slab is unknown and cannot be assessed without cutting into the slab. See Figure 5 for a schematic of the existing vent shaft collar area.

A 5-ft diameter and 4-ft high circular steel fan-housing is suspended over the shaft on ½ in thick steel plate that sits directly on top of the concrete slab covering the open shaft. Power drop cables and protective piping extend into the shaft from the surface (see Figure 5 and Attachment B – Photographs). Another, power drop cable protrudes from the ground about 41 ft west of the shaft. The area adjacent to the vent shaft pad has naturally revegetated.

3.2 Development Rock Area

The Development Rock Area (DRA) consists of approximately 2.4 acres of mined development rock. Development rock is unmineralized waste rock material mined from shaft development and other underground drifts constructed to reach uranium and vanadium mineralized zones.

The DRA is a low-profile tabular body of waste rock estimated to be no more than 10-feet thick. The DRA was apparently deposited in two layers resulting in a short terrace towards the western end which separates two west-facing slopes of waste rock. The western-most face is small in size, only a few feet high and of modest slope. The main face of the DRA is located no more than one hundred feet east of the west end of the DRA. This slope is approximately 9-feet high with a slope of approximately 1.5-ft vertical to 1-ft horizontal (1.5 to 1 or 1.5:1). This slope was bermed at the top to contain runoff that is generated on the top of the DRA. The south and north portions of the DRA have similar slopes (see Attachment B – Photographs). The west portion of the DRA consists of hummocky terrain that is the result of closely spaced individual loads of waste rock deposited by mining equipment. This material appears to represent the last loads from the mine and stands about 3 ft higher than the top of the DRA immediately to the east. Much of the DRA has naturally revegetated, consisting mostly of rabbit brush, some sage, and minor native grasses.

Stormwater structures also exist at the main mine site as runon and runoff ditches or swales and berms located upgradient and downgradient, respectively, of the development rock dump.

3.3 Topsoil Storage Pile

An elongated large topsoil storage pile is located immediately north of the DRA. The pile is estimated to be 1.5 acres in size and attaining a thickness of approximately 12 feet. The topsoil pile consists of a red silty sandy loam and is scattered with sparse native grasses and shrubs.

It is presumed that the topsoil underlying the DRA was salvaged and stored in the topsoil storage pile along with topsoil from the mine access road and the mine operations area. From field observations, it appears portions of the mine operations area are underlain by some topsoil and subsoils.

4.0 RECLAMATION

Mine site reclamation activities will include structure removal, shaft closure, site regrading, topsoil placement, and revegetation (seeding) as described in the following sections.

4.1 Structure Removal and Disposal

With exception of the production shaft and vent shaft foundations, all concrete pads will be broken-up in place using a pneumatic hammer mounted to an excavator. The broken concrete will be staged on site and then loaded to a conventional dump truck or rock truck and hauled to and disposed of at the Broad Canyon Landfill, a state-licensed facility that is located 2.1 miles southeast of Naturita, Colorado off State Highway 141. Alternatively, the concrete will be hauled to PRM's property near Nucla, Colorado for eventual reuse.

The hoist pad has parts of the electric hoist still in place. The hoist will be dismantled and the metal materials will be scrapped for salvage. Any oils or oil-like substances encountered during hoist remediation will be collected in a new steel 55-gallon drum. The composite waste oil will be sampled for characterization and the drum will be sealed and transported to PRM's warehouse in Nucla, Colorado until composition analysis is known. Depending on the composition, the oily waste will either be recycled or disposed of at a state-licensed waste management facility.

Metal grating, beams, and other metal support materials on the hoist house pad, the production shaft pad, and vent shaft pad will be scrapped as salvageable material, or transported to the Broad Canyon Landfill in accordance with landfill rules.

4.2 Shaft Closure

The production shaft and vent shaft will be closed using the same DRMS-approved method presented on Standard Drawing No. 3 – Concrete Shaft Closure (see Figure 6). However, this TR proposes to construct the shaft cap directly on existing concrete slab foundations that collar the surface portion of the shafts. This differs from the specification to construct the shaft cap on competent bedrock.

As mentioned, no information was found on the strength of the concrete used for the production shaft and vent shaft collars. It is reasonable to assume that at least a 4,000 lb (pounds per square inch, psi) cement mix was used for these structures.

To estimate the compressive force from the proposed shaft cap on the existing concrete slab, the sum of the self-weight of the cap plus a live load (soil backfill) can be estimated as summarized below.

The self-weight of the cap will include the weight of the beams, form, and cured cement.

- Beams: assume a W6x25 beam: 25 lbs per linear ft
    - 4 beams at 12 ft length = 4 beams x 12 ft x 25 lbs/ft = 1,200 lbs

- Form: assume 0.25-in steel plate steel at 10.21 lbs/ft^2 and a total area of 12 ft x 12 ft
    - Weight is 12 ft x 12 ft x 10.21 lbs/ft^2 = 1,470 lbs

- Cast-in-place concrete slab: assume 4,000 psi cured concrete; volume of 12 ft x 12 ft x 0.83 ft (10-in) = 120 ft^3 or 4.44 yd^3; weight of concrete is 4,000 lbs/yd^3
    - Weight of 12 ft x 12 ft x 0.83 ft slab = 4.44 yd^3 x 4,000 lbs/yd^3 = 17,778 lbs

- Total self-weight is 1,200 lbs + 1,470 lbs + 17,778 lbs = 20,448 lbs

The live load weight will consist of the weight of the backfilled soil over the cap and existing concrete foundation slab.

- Assume a soil bulk density of 120 lbs/ft^3

- Assume a backfilled soil depth of 4 ft and area of force on cap is 12 ft x 12 ft

- Total volume of soil is: 4 ft x 12 ft x 12 ft = 576 ft^3

- Weight of soil over cap area = 120 lbs/ft^3 x 576 ft^3 = 69,120 lbs

The total load is the sum of the self-weight and live load felt by the existing concrete slab. This equals 20,448 lbs + 69,120 lbs = 89,568 lbs.

The area of the collar slab experiencing this force is equal to a 12 ft x 12 ft (144 ft^2) area minus the area of the shaft (πr^2 = 50.27 ft^2) or 144 ft^2 – 50.27 ft^2 = 93.73 ft^2. The pressure, P, is equal to force per unit area or: 89,568lbs/93.73 ft^2 = 955.55 pounds/ft^2 or 6.64 pounds/in^2 (psi). This calculation demonstrates that the existing collar slab foundation should easily accommodate the loading force of the shaft cap materials and soil backfill.

4.2.1 Production Shaft

PRM dug two excavations near approximately 15 to 30 feet from the production shaft and encountered a sandstone bedrock at depth of 5 ft 6 in next to the production shaft pad. It was also observed that sandstone outcrops approximately 100 ft to the north of the pad. This sandstone is cemented and well-indurated but forms an uneven, inconsistently weathered surface where

exposed in the bottom of the excavations. The shovel of the large excavator could not readily penetrate this rock layer. It is likely that this sandstone is either Burro Canyon Formation or Dakota Sandstone.

PRM proposes to close the production shaft using specifications under Standard Drawing No. 3 – Concrete Shaft Closure, with two key revisions: 1) complete the shaft cap closure directly on top of the existing concrete collar slab, and 2) do not construct an access manhole. Standard Drawing No. 3 is shown in Figure 6.

The shaft cap will be constructed directly on top of the existing concrete slab that collars the top of the shaft. There are several reasons that support this construction method:

- The existing concrete slab that collars the shaft will provide the strength and stability required to support the proposed shaft cap design.

- The identified competent sandstone bedrock surface underlying the shaft collar is likely uneven and inconsistent in induration requiring significant preparation of this surface to support construction of the shaft cap. The removal of the existing concrete collar and slab, excavation to bedrock, and preparation of the bedrock surface will add significant time and expenses to the project as well as add complications to shaft stability and safety measures.

- Soils underneath the production shaft were likely compacted prior to slab installation and the slab has existed on site for 45 years with no evidence of subsidence or substantial weathering.

- Reclamation of the shaft cap closure on the current slab surface will result in a small shallow revegetated mound which will not affect overall stormwater behavior at the site.

- The shaft cap closure will allow for a straight-forward process for reopening the shaft for potential future mining operations.

The proposed production shaft closure design is shown as plan and cross section schematics in Figures 7-1 and 7-2, respectively. Steel beam supports and concrete specifications were selected per guidance in Standard Drawing No. 3. The shaft span is 8 feet and 4 feet of fill height (depth of cover) is anticipated. Slab Design Charts on Standard Drawing No. 3 indicate that a “D” slab designation is expected and will require a slab thickness of 10-inches (0.83 ft). A “D” slab designation requires reinforced transverse rebar of #8 at 7-inch spacing, and longitudinal rebar of #4 at 11-inch spacing. Prior to concrete placement the beam and form framework will be sprayed with a protective sealant (asphalt based or similar product). Two 2-inch polyvinyl chloride (PVC) drain pipes will be installed through the cast-in-place slab.

The general reclamation process of the production shaft will include the following steps.

- The metal grating currently covering the shaft and any other metal that protrudes from the shaft or near the shaft will be removed flush to or below the concrete slab surface.

- The existing concrete slab will be swept clean of debris.

- Any uneven surfaces in the concrete will be repaired with fresh neat cement.

- A pre-constructed metal framework consisting of four steel support beams (size: W6x20 or W6x25) and formwork (stay-in-place bridge decking or steel metal plate) will be laid in place on top of the concrete pad at equal distances spanning the shaft (see cross section A-A' plan view, in Standard Drawing No. 3 and Figures 7-1 and 7-2). The beams and support forms will extend at least 2 feet from the shaft opening in the concrete collar.

- The four corners of the outer-most beams will be anchored to the concrete slab with metal bolts.

- A wood form will be constructed encompassing the end of the beams and at a distance 2 feet from the shaft's edge (along the sides of the outside beams).

- Rebar reinforcement will be installed inside the form, in between and on the outside of the beams.

- The cast-in-place, 4,000 psi-rated cement will be poured to a depth of at least 10 inches inside the cap form. This should provide a cover of about 4 in over the top of the beams.

- Measures will be taken to account for cold-weather placement of the cement materials.

- The cast-in-place concrete will be allowed to cure for at least 7 days before burial with subsoils and topsoil.

- Onsite soil and topsoil will be placed over the shaft cap not to exceed a depth of 4 ft above the cap. Six inches of topsoil will be applied. The graded slope will not exceed a steepness of 3:1.

- The regraded shaft location will be revegetated in accordance with Section 4.5.

4.2.2 Vent Shaft

Similar to the production shaft, the vent shaft is also collared in a concrete slab. Figure 5 shows a schematic plan view of the existing vent shaft pad. The shaft measures eight feet in diameter, and appears to have a gunite (shotcrete) lining further down shaft from the surface.

The concrete slab that surrounds the shaft opening consists of single continuous ring around the shaft that is 2 feet 2 inches thick and extends four feet from the shaft perimeter. There are no

documents available on the DRMS website that discuss specific construction details of the vent shaft. Steel reinforcement in this slab is unknown and cannot be assessed without cutting into the slab. See Figure 5 for a schematic of the existing vent shaft collar area.

Two excavations near (4 to 30 feet) the vent shaft encountered sandstone bedrock at depth of 4 ft 8 in. Like the production shaft, the sandstone is well-cemented and well-indurated but forms an uneven, inconsistently weathered surface where exposed in the bottom of the excavations. The large shovel of the excavator could not readily penetrate this rock layer.

PRM proposes to close the vent shaft using specifications under Standard Drawing No. 3 – Concrete Shaft Closure, with two key revisions: 1) complete the shaft cap closure directly on top of the existing concrete collar slab, and 2) do not construct an access manhole. Standard Drawing No. 3 is provided as Figure 6.

The shaft cap will be constructed directly on top of the existing concrete pad that collars the top of the shaft using the same rationale presented under the production shaft in Section 4.2.1.

The proposed vent shaft closure design is shown as schematic drawings in Figure 8. Steel beam supports and concrete specifications were selected per guidance in Standard Drawing No. 3. The shaft span is 8 feet and 4 feet of fill height (depth of cover) above the finished cap is anticipated. Slab Design Charts on Standard Drawing No. 3 indicate that a “D” slab designation is expected and will require a slab thickness of 10 in. Four steel beams, W6x20 or W6x25 type, will be installed over the shaft, extending at least two feet beyond the edge of the shaft. A steel stay-in-place form (bridge decking) or solid plate steel will be fastened to the bottom of the beams providing the bottom form for cast-in-place cement placement.

The beams and form will be pre-fabricated offsite and laid in place over the shaft on top of the existing concrete slab. Each corner of the framework will be anchored to the concrete slab using anchor bolts. A “D” slab designation requires reinforced transverse rebar of #8 at 7-inch spacing, and longitudinal rebar of #4 at 11-inch spacing. Prior to concrete placement the beam and form framework will be sprayed with a protective sealant (asphalt based or similar product). Two 2-inch drain PVC pipes will be installed through the cast-in-place slab.

The general reclamation process of the production shaft will include the following steps.

- Any metal that protrudes from the shaft or near the shaft will be removed flush to or below the concrete pad surface.
- The existing concrete pad and steel plating will be swept clean of debris.
- The steel plate covering portions of the concrete slab and open shaft will be left in place.
- A pre-constructed metal framework consisting of four steel support beams (size: W6x20 or W6x25) and formwork (stay-in-place bridge decking or steel metal plate) will be laid

in place on top of the concrete pad at equal distances spanning the shaft (see cross section A-A' plan view, in Standard Drawing No. 3, and Figure 8. The beams and support forms will extend at least 2 feet beyond the edge of the shaft on top of the concrete slab collar.

- The four corners of the outer-most beams will be anchored to the concrete slab with metal bolts.

- A wood form will be constructed encompassing the end of the beams and at a distance 2 feet from the shaft's edge (along the sides of the outside beams).

- Rebar reinforcement will be installed inside the form, in between and on the outside of the beams.

- The cast-in-place, 4,000 psi-rated cement will be poured to a depth of at least 10 inches inside the cap form. This should provide a cover of about 4 in over the top of the beams.

- Measures will be taken to account for cold-weather placement of the cement materials.

- The cast-in-place concrete will be allowed to cure for at least 7 days before burial with subsoils and topsoil.

- Onsite soil and topsoil will be placed over the shaft cap not to exceed a depth of 4 ft above the cap. Six inches of topsoil will be applied. The graded slope will not exceed a steepness of 3:1.

- The regraded shaft location will be revegetated in accordance with Section 4.5.

4.3 Site Regrading/Recontouring

The 7.4-acre affected area contains the main waste rock dump, several small scattered waste-rock piles, a top-soil storage pile, and the surface operations area, which includes the mine access road, the hoist house, production shaft, compressor, and shop/change house concrete pads as previously mentioned, and stormwater management structures (ditches and berms).

Regrading of the affected area will be consistent with the original reclamation regrading plan as prepared by Energy Fuels Nuclear, Inc. (see Figure 2). The final slopes of the regraded area will not exceed a 3:1 slope and blend with surrounding undisturbed land.

Regrading of the mine operations area is expected to be minimal as this area is at or near natural grade; any elevated pads will be regraded to blend with adjacent natural contours.

The final grade of the sloped western portion (approximately the western quarter) of the DRA will be pocket-excavated (pocked). The purpose of pocking is to provide a rough surface to the soil that will slow and collect stormwater runoff and reduce sediment transport. Individual pocks

will be between 12 and 24-inches deep and 24 to 36 inches wide, and spaced in a random manner. For practical construction, it will be necessary to install pocks after topsoil placement. This means that the placed topsoil will be mixed in with waste rock and that seeding will be applied to areas that are exposed waste rock. It is anticipated that the pocks will degrade with time and fill with sediment.

On approximately the eastern three quarters of the DRA and in the mine operations area, the regraded ground surface will be scarified by ripping or furrowing to a depth of approximately one-foot after topsoil placement. Rip or furrow direction will be approximately perpendicular to the direction of slope. If deemed necessary, low water bars/berms will be constructed – also perpendicular to slope direction. The rough ground surface resulting from pocks, soil ripping and water bars will serve to reduce runoff velocities and locally capture and store water on site, thereby facilitating revegetation.

After the topsoil storage area is depleted of topsoil, the area will be graded to blend with natural topography and the regraded DRA. A sufficient amount of topsoil will be left in place at final grade.

All waste rock material that exists in the small isolated scattered piles will be incorporated into the main waste rock area, or if feasible regraded in-situ. The steep 1.5:1 face of the main DRA will be pulled back to a 3:1 grade. Waste rock material will not extend beyond the existing stormwater runoff ditches and berms. Grubbed existing vegetation will be mixed in with the waste rock material.

The regrading process will employ the use of one or more of the following equipment types:

1. D-6 bulldozer
2. Excavator
3. Front-end loader
4. Dump Truck
5. Skid-Steer
6. Surface haul truck (tandem-axle, approx. 20-ton capacity)

4.4 Topsoil Placement

Material from the main topsoil storage pile will be distributed in a six-inch thick layer on top of the regraded DRA material using multiple types of equipment. Top soil placement will initially focus on the regraded DRA. If topsoil quantity does not allow for a complete six-inch layer, material will be thinned toward the east end of the affected area near County Road DD19. This will allow for greater ease of importing soil, if needed.

It is important to note that in a few locations near the production shaft, bedrock is exposed. It is not known if these areas were exposed prior to mining. Revegetation on top of bedrock may be

less successful due to poor soil moisture retention and drainage. The application of subsoils and topsoil in these areas will be assessed as work progresses.

Remnants of topsoil are present as small scattered piles in places in the mine operations area. These topsoil piles will be incorporated into local topsoil needs. Topsoil placement in this area will be done near the end of the topsoil phase of reclamation. If topsoil supply is low, topsoil applications will focus on areas where existing topsoil is thin or not present.

The topsoiling process may employ the use of one or more of the following equipment types:

1. D-6 bulldozer
2. Scraper
3. Grader
4. Front-end loader
5. Belly dump truck
6. Dump truck
7. Excavator
8. Skid-steer

4.5 Revegetation

Seed will be applied by range drill, broadcasting, or hydromulching to the roughened topsoil surface depending on equipment availability. A BLM-approved seed mix will be applied up to two times the specified application rate to enhance vegetation success. Mulch will be applied using certified weed-free straw at a rate of two tons per acre. The seeded and mulched surface will be dry raked, harrowed, or disced after application. No fertilizer applications are planned.

The BLM seed mix consists of the following:

Code	Common	Cultivar	Genus	species	Lbs PLS/acre
ACHY	INDIAN RICEGRASS	rimrock/paloma	ACHNATHERUM	hymenoides	2
ELEL5	BOTTLEBRUSH SQUIRRELTAIL	Toe Jam	ELYMUS	elymoides	2
SPCR	SAND DROPSEED	UP/X-VNS	SPOROBOLUS	cryptandrus	0.5
ELTR	Slender Wheatgrass	San Luis	Elymus	trachycaulus	3
POSE	SANDBURG BLUEGRASS	UP	POA	secunda	0.5
PLJA	James' galleta grass	Viva	Pleuraphis	jamesii	2
BOGR	Blue grama	Hachita	Bouteloua	gracilis	0.25
HEAN3	ANNUAL SUNFLOWER	X-VNS	HELIANTHUS	annuus	1
LILEL2	LEWIS FLAX	Maple Grove	LINUM	lewisii spp. lewesii	0.5
HEMU	Showy Goldeneye	VNS	Heliomeris	multiflora	0.05
CLSE	Rocky Mt Bee Plant	X-VNS	Cleome	serrulata	2
				Total lbs/acre:	**13.8**

The revegetation phase may employ the use of the following equipment:

1. Range drill
2. Tractor-mounted disc/ripper/harrow
3. Powered truck or ATV-mounted seed spreader
4. Power hydromulcher or mulcher

4.6 Stormwater Management

The existing stormwater runoff swale that encompasses the DRA and mine operations area, will be left in place to reduce runoff from the reclaimed areas. However, these shallow depressions will be seeded to further enhance stormwater and sedimentation control and visually blend with surrounding natural vegetation.

The roughened topsoiled surface and intermittent installation of water bars will act as runoff velocity check structures that will also capture and store runoff and sediment during high-intensity precipitation events. Where appropriate, biodegradable straw wattle will be installed in local areas to control sedimentation.

4.7 Reclamation Fencing

If it is determined that existing ungulate wildlife and/or domestic livestock are a threat to the revegetation progress, reclamation fencing will be installed around the perimeter of the reclaimed area. The installation of reclamation fencing will follow BLM specifications.

4.8 Site Monitoring and Maintenance

Site monitoring will focus on the progress of revegetation cover and density, weed occurrence, and stormwater management. The reclaimed mine site will be monitored twice annually and when possible, after severe thunderstorm activity in the region.

Maintenance of stormwater management structures will be conducted as needed. If necessary, weed management will consist of annual herbicide treatments per a BLM-approved pesticide use permit.

REFERENCES

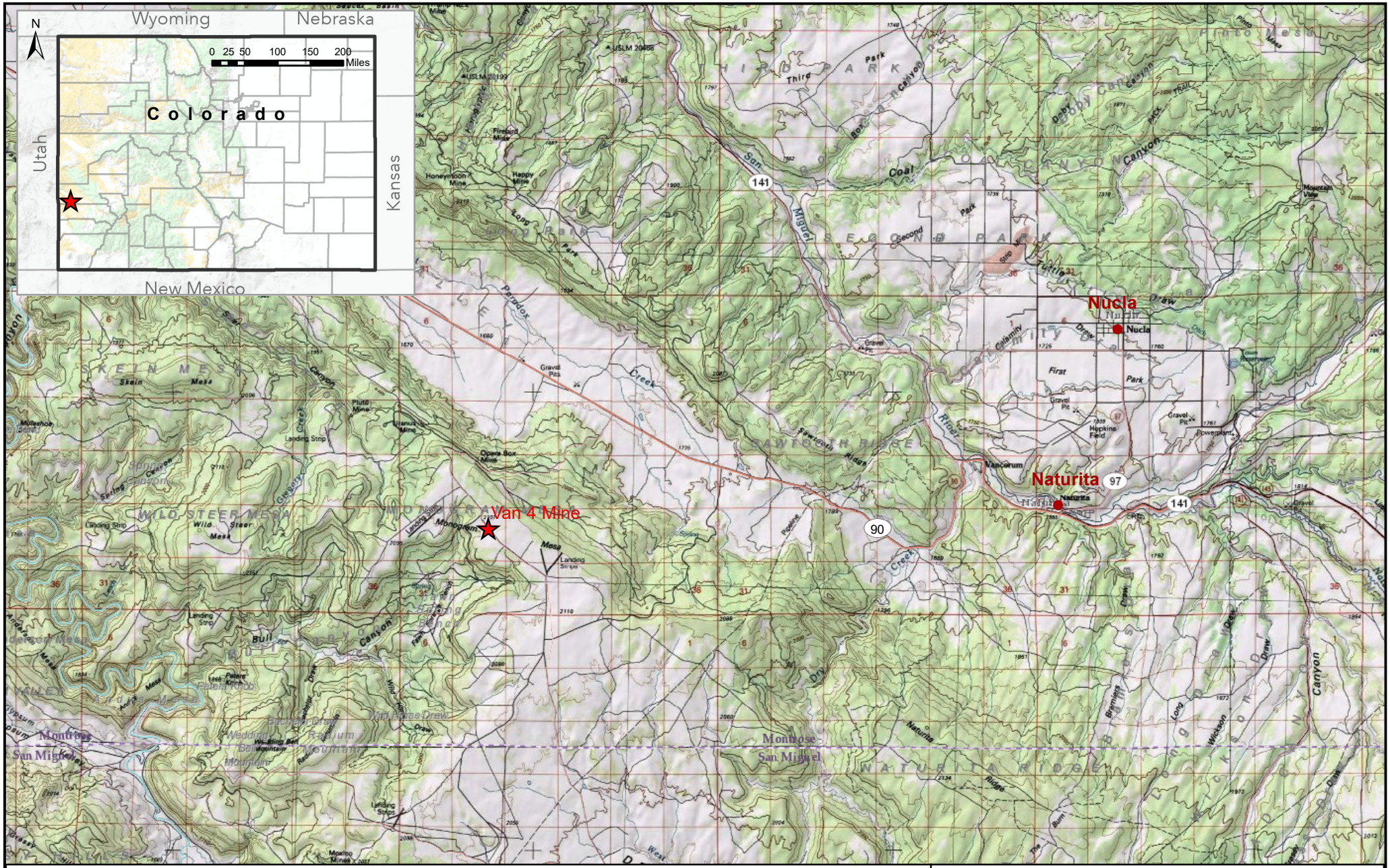
DRMS, 1999. Colorado Division of Reclamation, Mining and Safety. Permfile61935, pg. 8, paragraph 5. Colorado Division of Minerals and Geology Inspection Report dated January 13, 1999.

Energy Fuels Nuclear, Inc., 1997. Figure 6.3.5.1 Mining Plan and Layout. January, 1997. Exhibit E to DMG Permit No. M-1997-032.

Energy Fuels Nuclear, Inc., 1997. Figure 6.3.5.2 Reclamation Plan. March, 1997. Exhibit E to DMG Permit No. M-1997-032.

Denison, 2009. Environmental Protection Plan Van 4 Mine Montrose County, Colorado Permit M-1997-032. Denison Mines (USA) Corp. June 5, 2009.

FIGURES



Legend

- Mine Location
- Town

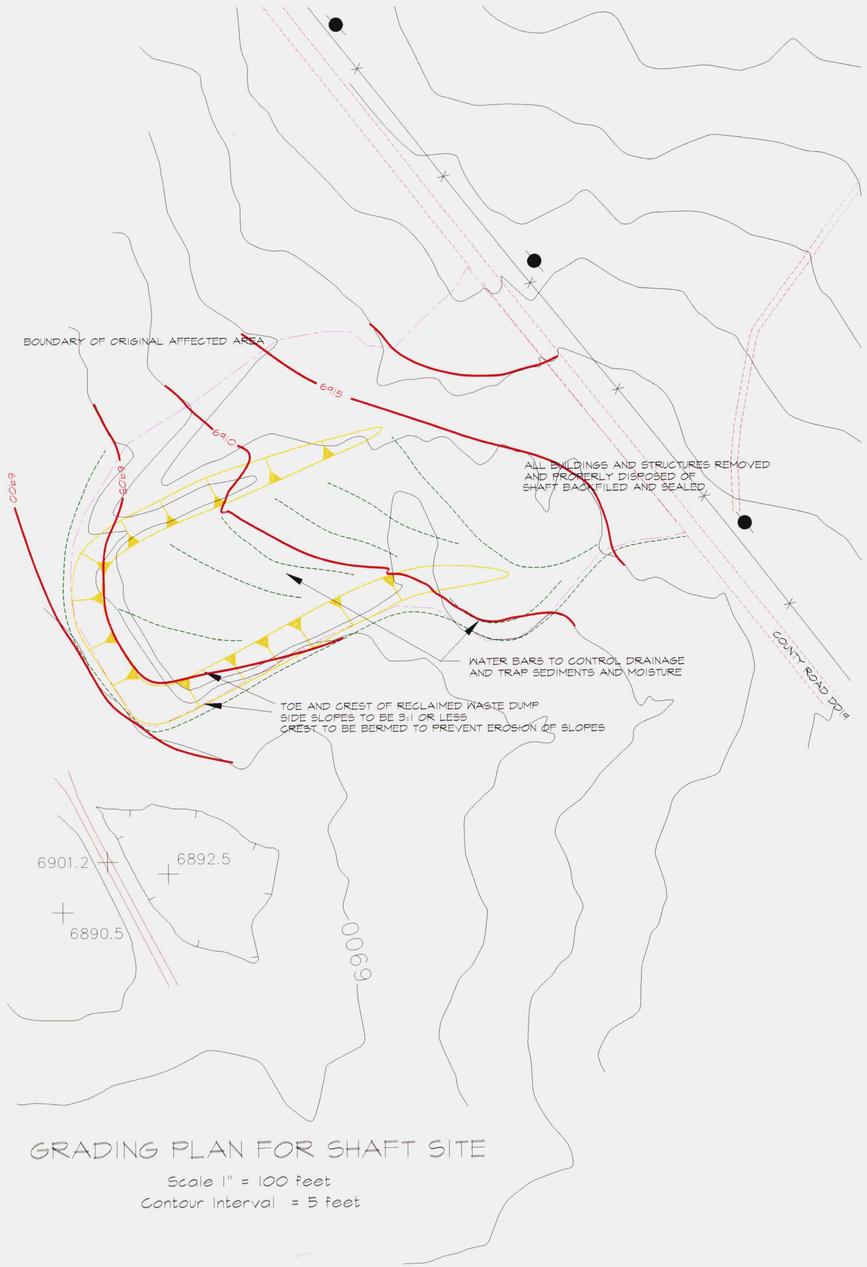
N

0 1.25 2.5 5 7.5 10 Miles

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Sources: Esri, USGS, NOAA
Sources: Esri, Garmin, USGS, NPS

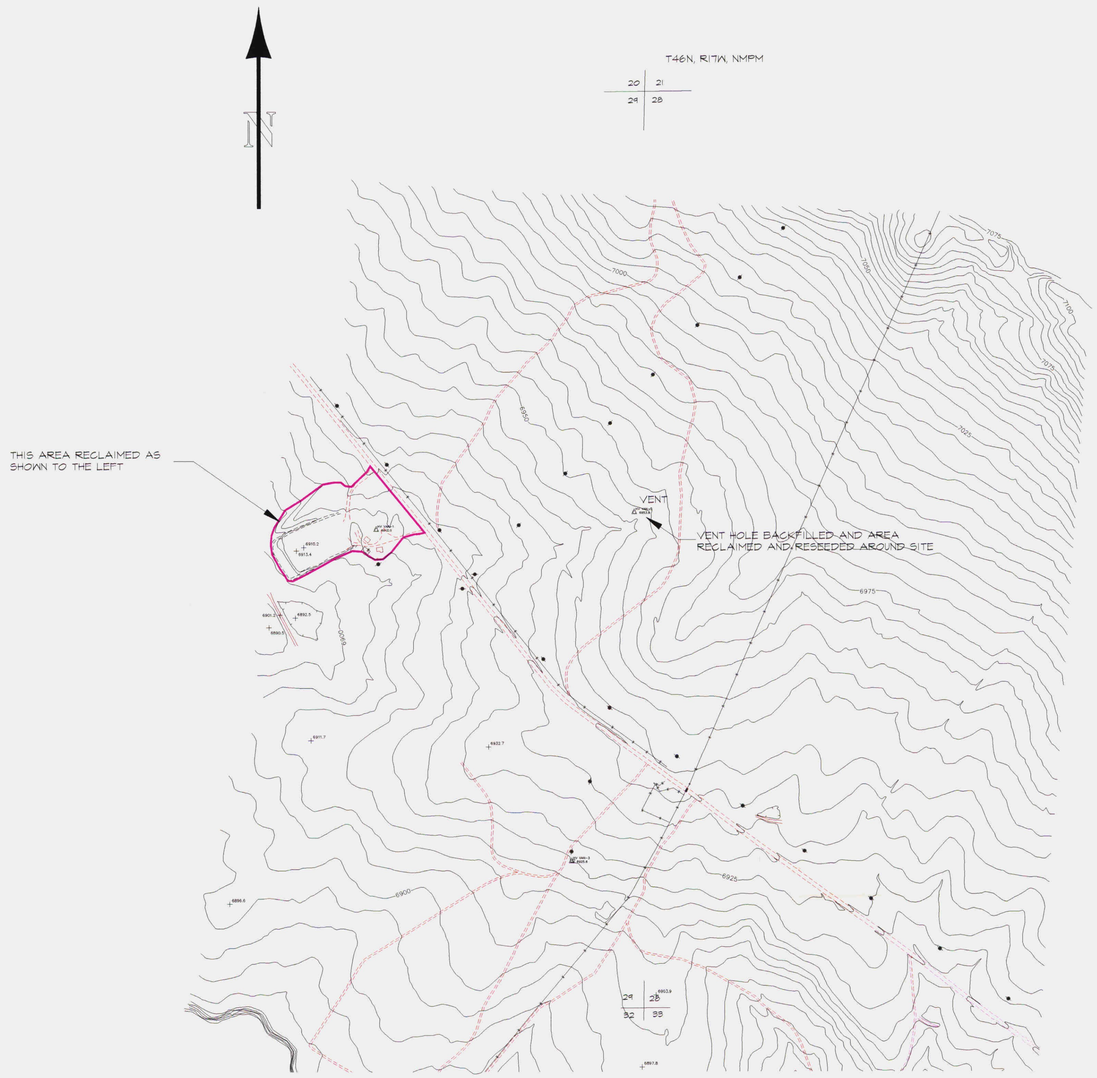
Figure 1. Van 4 Mine Location Map
Pinon Ridge Mining LLC

Western Water & Land, Inc.



GRADING PLAN FOR SHAFT SITE

Scale 1" = 100 feet
Contour Interval = 5 feet



GENERAL VIEW SHOWING AREA TOPOGRAPHY

Scale 1"= 400 feet
Contour interval = 5 feet

Mapping taken from Aerial Photography dated Septmber, 1992

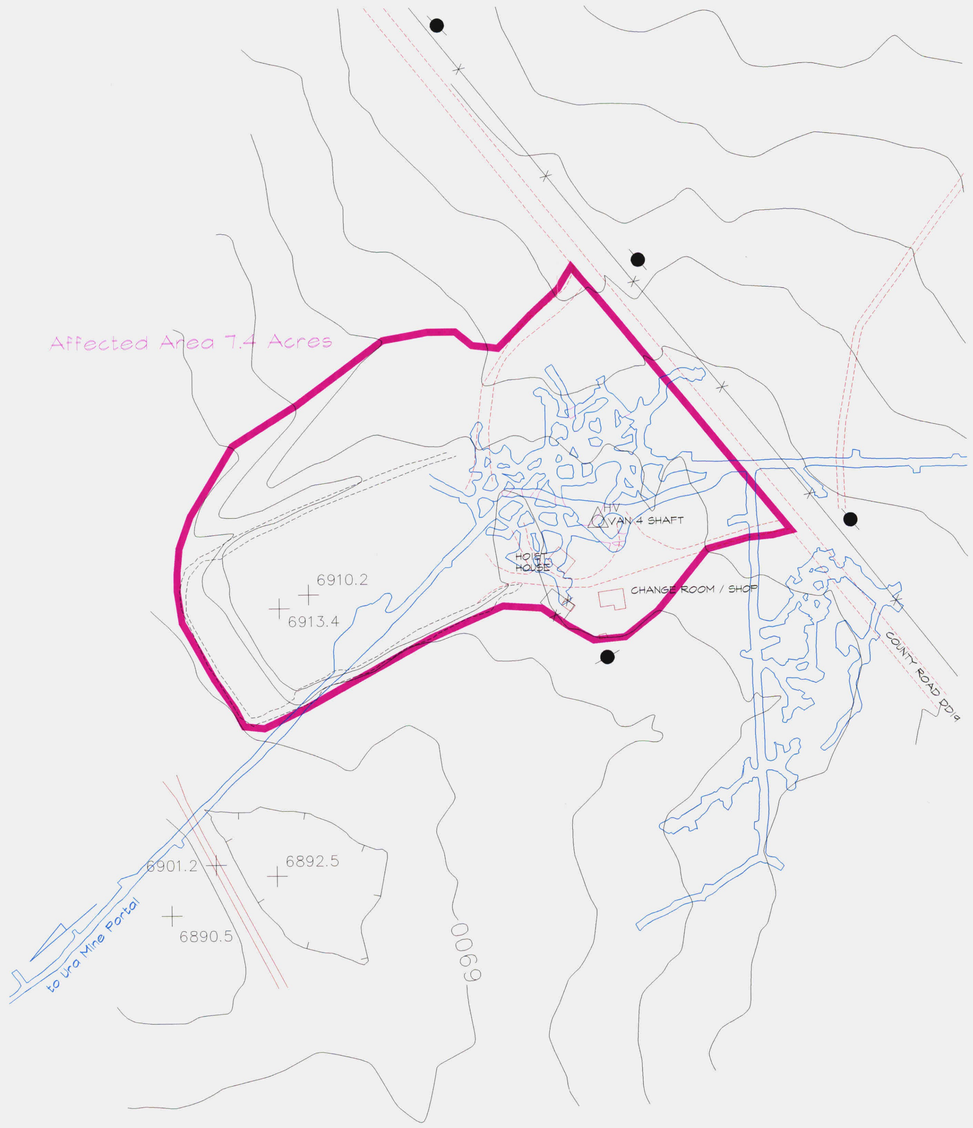
Figure 2. Energy Fuels Nuclear Exhibit E - Reclamation Plan Affected area, grading plan, and topography (EFN, 1998).

DATE	BY	REVISIONS

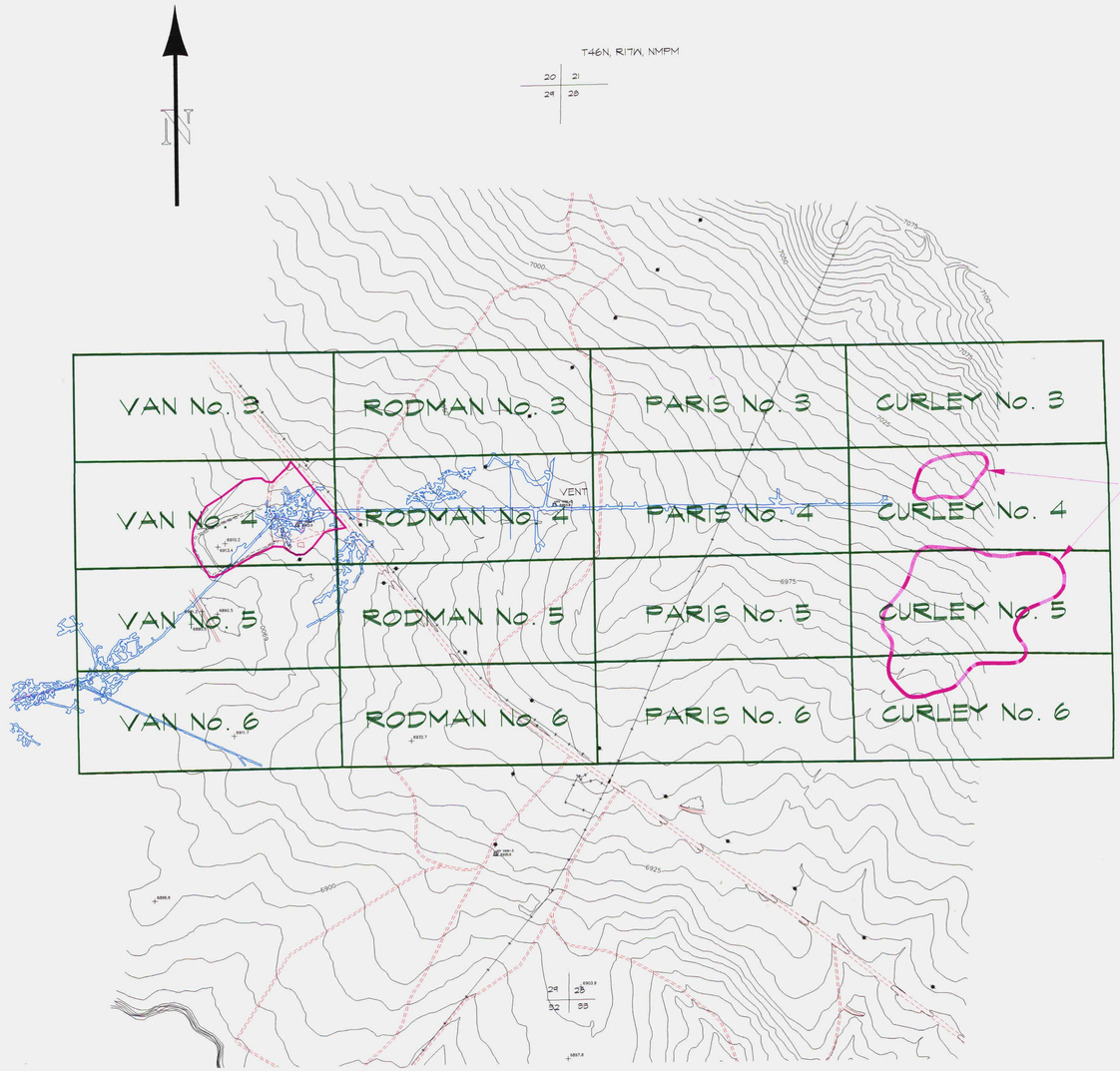
ENERGY FUELS NUCLEAR, INC.
Colorado Plateau Operations
2784 Compass Drive, Ste 239, Grand Junction, CO 81506

FIGURE 6.3.5.2 --- RECLAMATION PLAN
Van 4 Shaft Site
Showing Surface, Land Position & Underground Workings

DRAWING: VAN4SURF	DRAWN: RA Van Horn	SHEET
CHKD BY:	DATE: March, 1997	of
APP:	SCALE: As Shown	



DETAILED VIEW OF VAN4 SHAFT SITE
Scale 1" = 100 feet
Contour Interval = 5 feet



GENERAL VIEW SHOWING SURFACE, LAND & UNDERGROUND WORKINGS
Scale 1"= 400 feet
Contour interval = 5 feet

Mapping taken from Aerial Photography dated September, 1992

Figure 3. Energy Fuels Nuclear, Inc. - Van 4 Mine Surface, Claim Block, and Underground Workings Map (EFNI, 1997).

DATE	BY	REVISIONS

ENERGY FUELS NUCLEAR, INC.
Colorado Plateau Operations
2784 Compass Drive, Ste 294, Grand Junction, CO 81506

FIGURE 6.3.5.1 ---MINING PLAN & LAYOUT
Van 4 Shaft Site
Showing Surface, Land Position & Underground Workings

DRAWING: VAN4SURF	DRAWN: RA van Horn	SHEET
CHKD BY:	DATE: Jan. 1997	of
APP:	SCALE: As Shown	

FIGURE 4-1. Production Shaft Existing Conditions - Plan Schematic

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Applications in Earth Science

SHEET 1 OF 2
JOB NO. 21000.05
DATE 1/22/2025
PROJECT Van 4 Mine Reclamation
SUBJECT Production Shaft Existing Conditions
COMPUTED BY BDS
CHECKED BY KLM

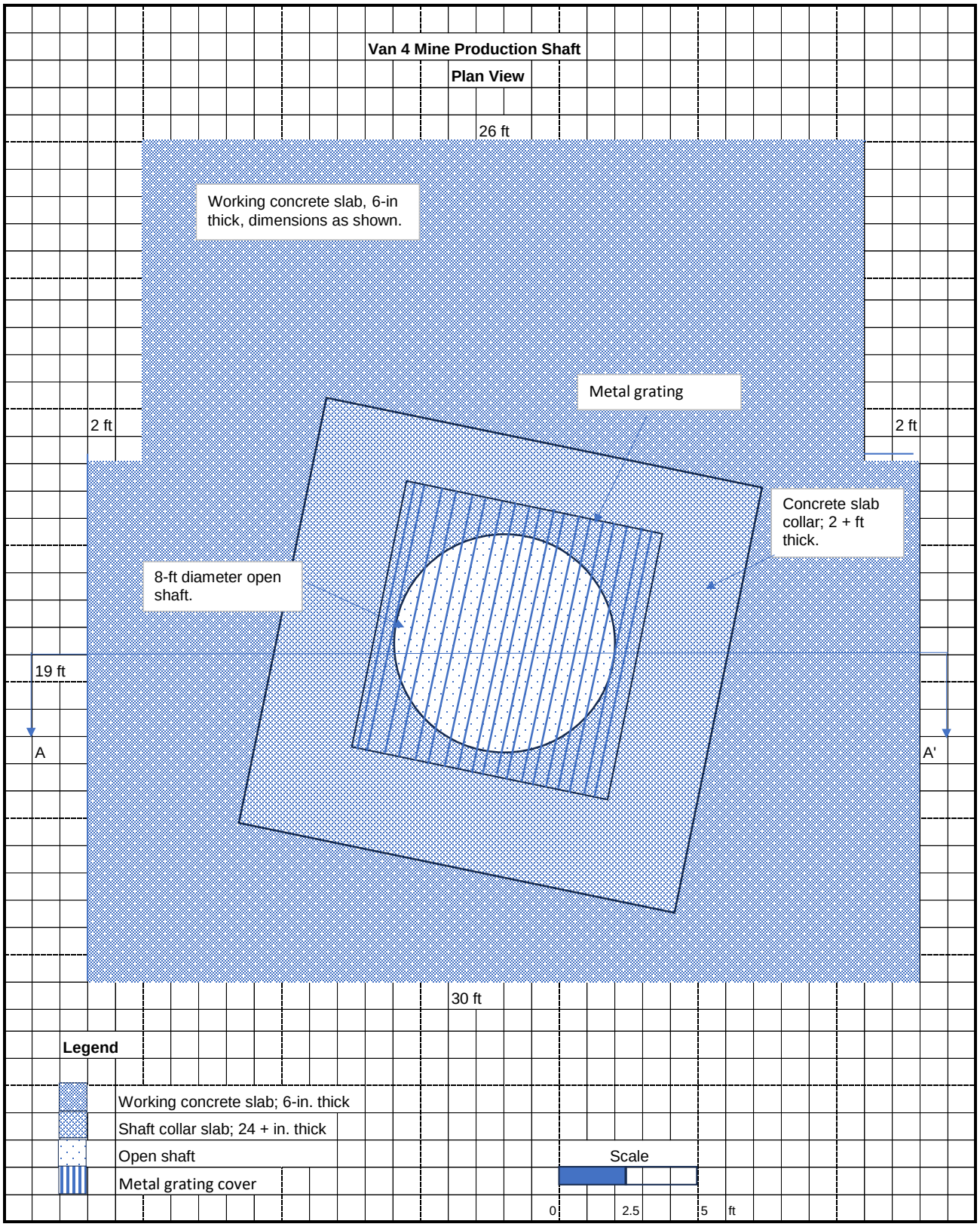

FIGURE 4-2. Production Shaft Existing Conditions - Cross Section A-A' Schematic

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Applications in Earth Science

SHEET 2 OF 2
JOB NO. 21000.05
DATE 1/22/2025
PROJECT Van 4 Mine Reclamation
SUBJECT Production Shaft Existing Conditions
COMPUTED BY BDS
CHECKED BY KLM

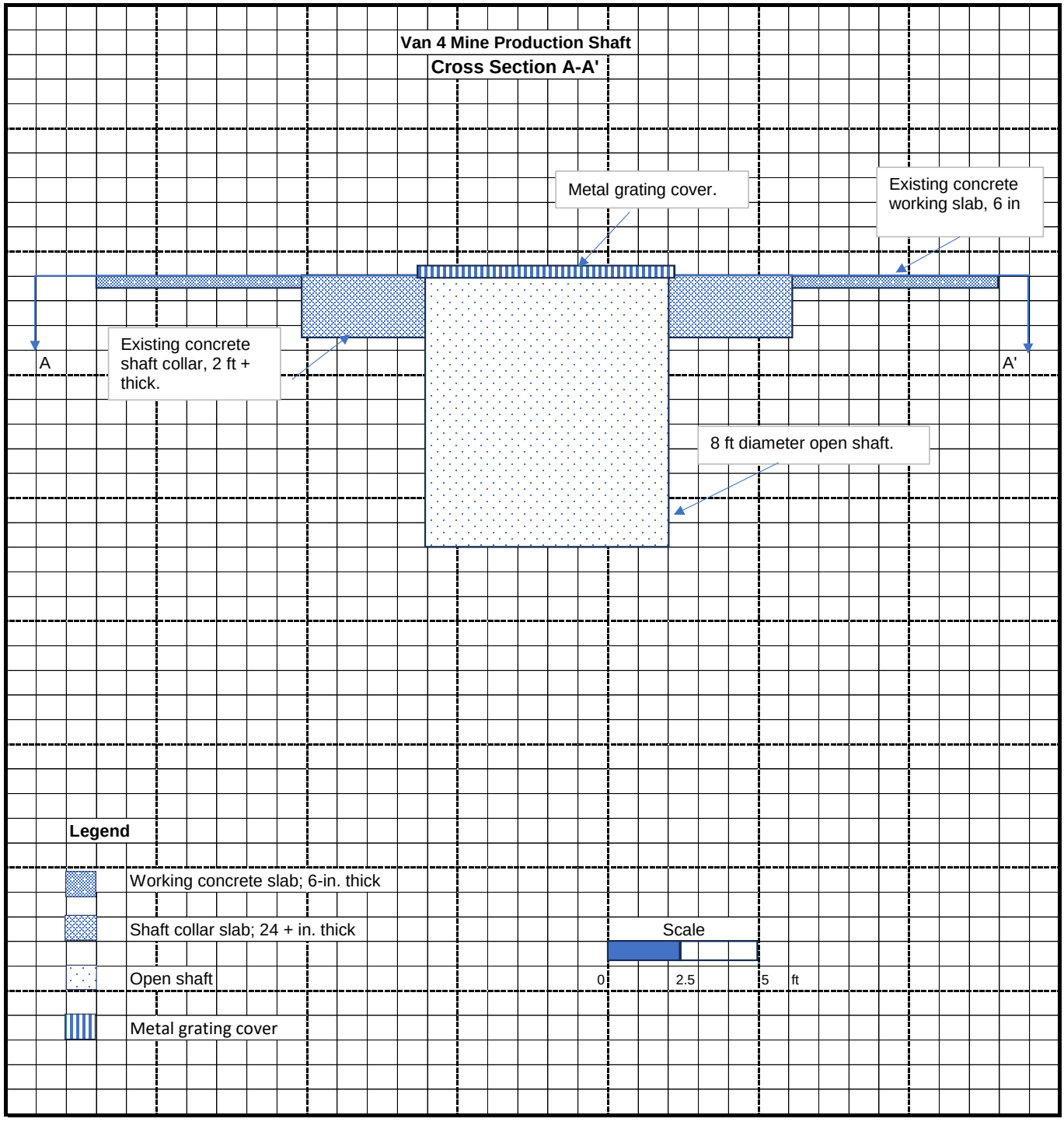

FIGURE 5. Vent Shaft Existing Conditions - Plan and Cross Section A-A' Schematic

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Applications in Earth Science

SHEET 1 OF 1

JOB NO. 12100.05

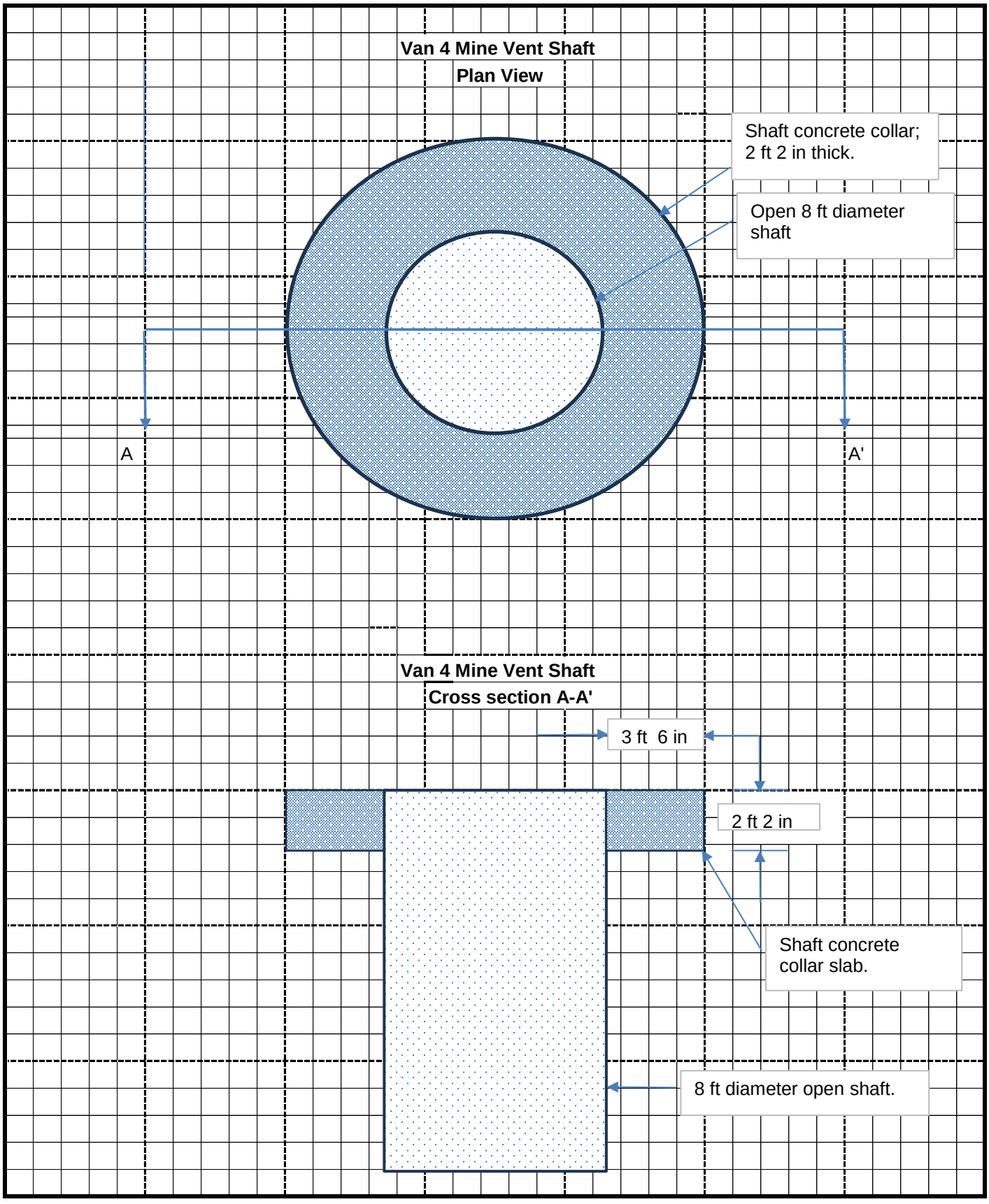
DATE 1/22/2025

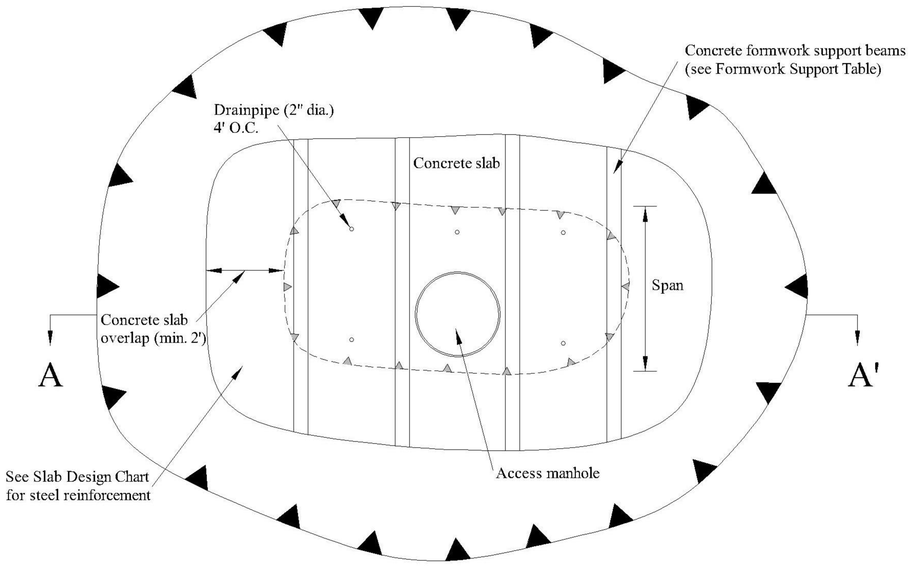
PROJECT Van 4 Mine Reclamation

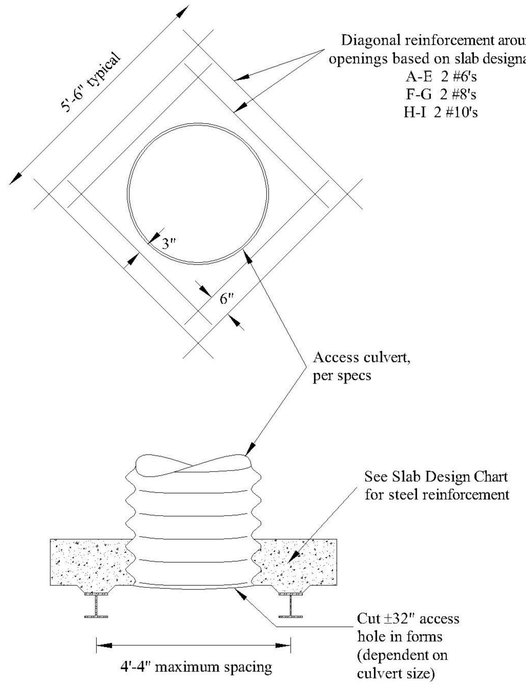
SUBJECT Vent Shaft Existing Conditions

COMPUTED BY BDS

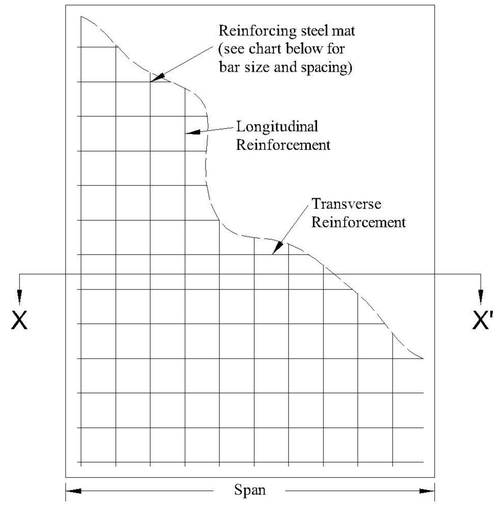
CHECKED BY KLM



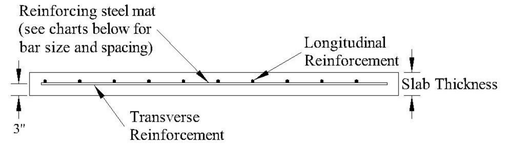




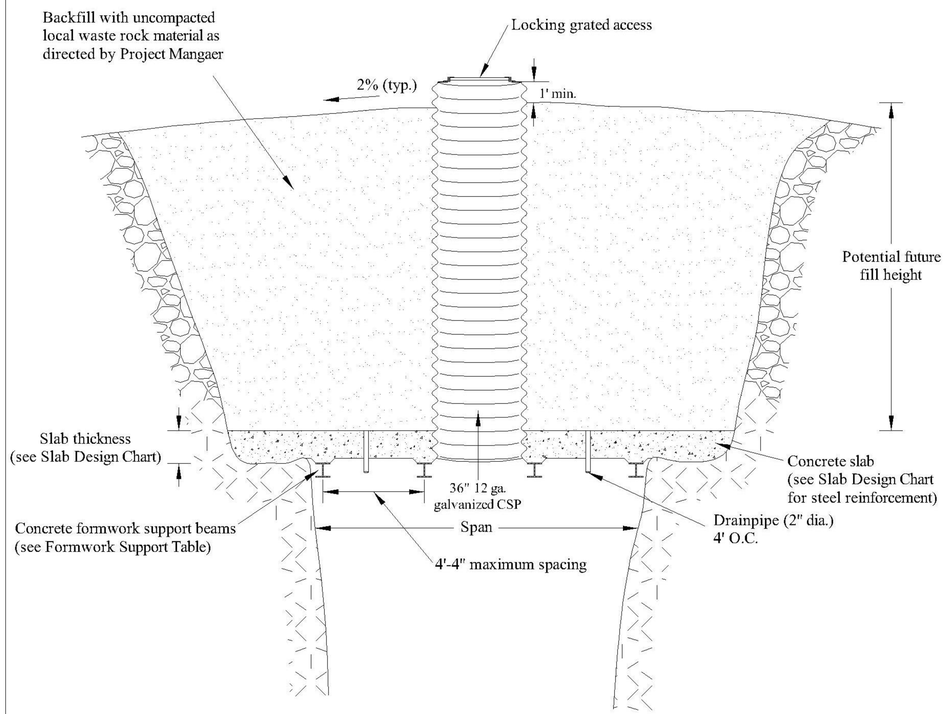
ACCESS MANHOLE DETAILS



CONCRETE SHAFT CLOSURE SLAB DESIGN



SLAB SECTION (X-X')



CAST IN PLACE SECTION (A-A')

FORMWORK SUPPORT CHART

Slab Designation	Formwork support (based on 4'-4" spacing)	
	Wood	Steel
A	8 x 10	W6x20(10.0)
B	8 x 10	W6x20(10.0)
C	8 x 12	W6x20(10.0)
D	8 x 12	W6x20(10.0)
E	8 x 16	W6x25(16.7)
F	8 x 18	W8x24(19.3)
G	-	W8x28(21.9)
H	-	W8x31(24.5)
I	-	W8x31(27.2)

*All form decking shall be corrugated stay in place forms (bridge decking), unless approved by Project Manager.

SLAB DESIGN CHARTS

Competent Rock Opening Span (ft)	Potential Future Fill Height Range (Depth of Cover) (ft)				
	0-4	4-8	8-12	12-16	16-20
4	D-panels/A	D-panels/A	D-panels/A	D-panels/B	E-panels/B
5	D-panels/A	D-panels/A	E-panels/B	E-panels/C	E-panels/C
6	D-panels/A	E-panels/B	E-panels/C	E-panels/C	D
7	D-panels/B	E-panels/B	E-panels/C	D	E
8	D-panels/B	E-panels/C	D	E	E
10	E-panels/C	D	E	F	F
12	E-panels/C	E	F	F	G
14	D	E	F	G	H
16	E	F	G	H	I
20	F	G	H	I	
24	G	H	I		

Slab Designation	Slab Thickness (in)	Transverse Rebar (across span)	Longitudinal Rebar
A	7	#6 @ 6"	#4 @ 12"
B	8	#6 @ 6"	#4 @ 12"
C	9	#7 @ 6"	#4 @ 12"
D	10	#8 @ 7"	#4 @ 11"
E	12	#8 @ 6"	#4 @ 9"
F	14	#9 @ 6"	#5 @ 12"
G	16	#10 @ 6"	#5 @ 10"
H	18	#10 @ 6"	#5 @ 9"
I	20	#11 @ 7"	#6 @ 12"

*4000 PSI Concrete Required

Figure 6. Colorado DRMS Standard Drawing No. 3 Concrete Shaft Closure

CAUTION: This project requires construction work around and over hazardous and unprotected mine shafts, stope, adits, and other openings which may be open to the surface or hidden from view by trash, debris or thin and unstable layers of surficial materials or rock. The contractor shall be responsible for thoroughly investigating the site conditions and scheduling his equipment, equipment operations, personnel and safety procedures to prevent accidents and injuries.

COLORADO DIVISION OF MINERALS & GEOLOGY
RECLAMATION•MINING SAFETY•SCIENCE

INACTIVE MINE RECLAMATION PROGRAM

STANDARD DRAWING No. 3

CONCRETE SHAFT CLOSURE

Scale Varies	2/24/04	Sheet No. 1 of 1
Drawn By: JTG	Reviewed By: JTH & ALA	

FIGURE 7-1. Production Shaft Cap Closure - Plan Schematic

Western Water & Land, Inc.
Applications in Earth Science

SHEET 1 OF 2
JOB NO. 12100.05
DATE 1/22/2025
PROJECT Van 4 Mine Reclamation
SUBJECT Production Shaft Cap Closure
COMPUTED BY BDS
CHECKED BY KLM

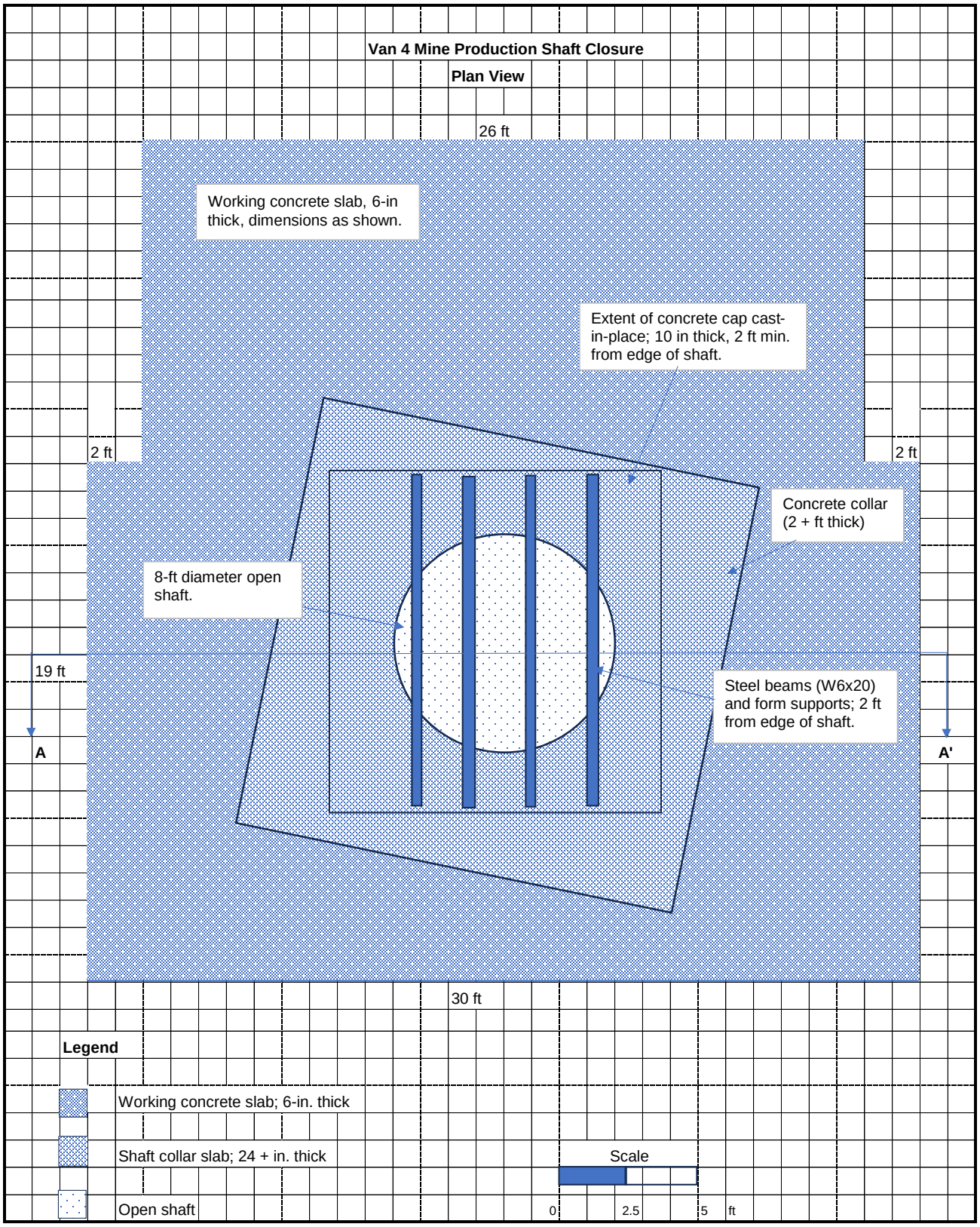


FIGURE 7-2. Production Shaft Cap Closure – Cross Section A-A' Schematic

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JOB NO. 12100.05
DATE 1/22/2025
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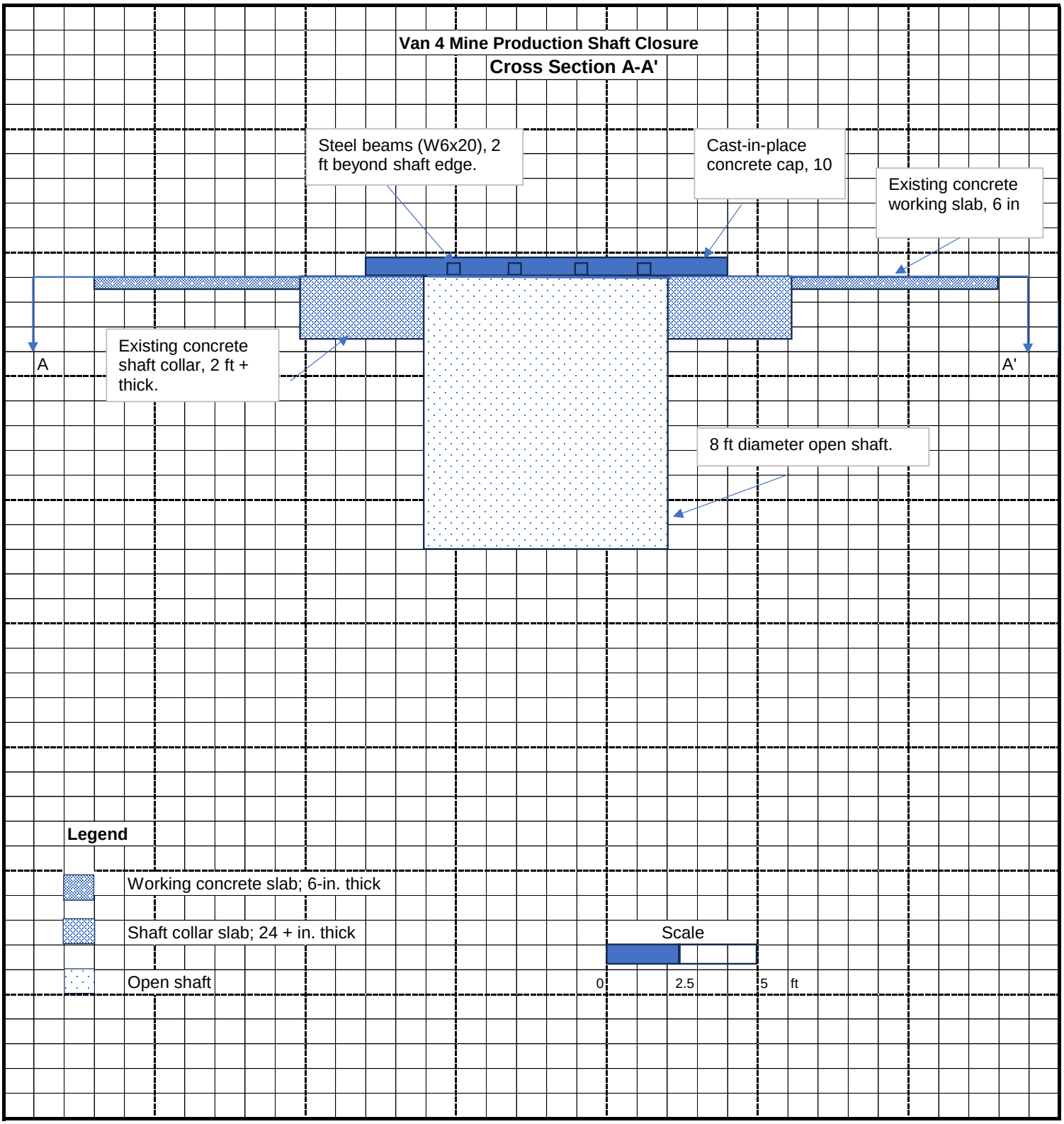

FIGURE 8. Vent Shaft Existing Conditions - Plan and Cross Section A-A' Schematic

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Applications in Earth Science

SHEET 1 OF 1

JOB NO. 12100.05

DATE 1/22/2025

PROJECT Van 4 Mine Reclamation

SUBJECT Vent Shaft Cap Closure

COMPUTED BY BDS

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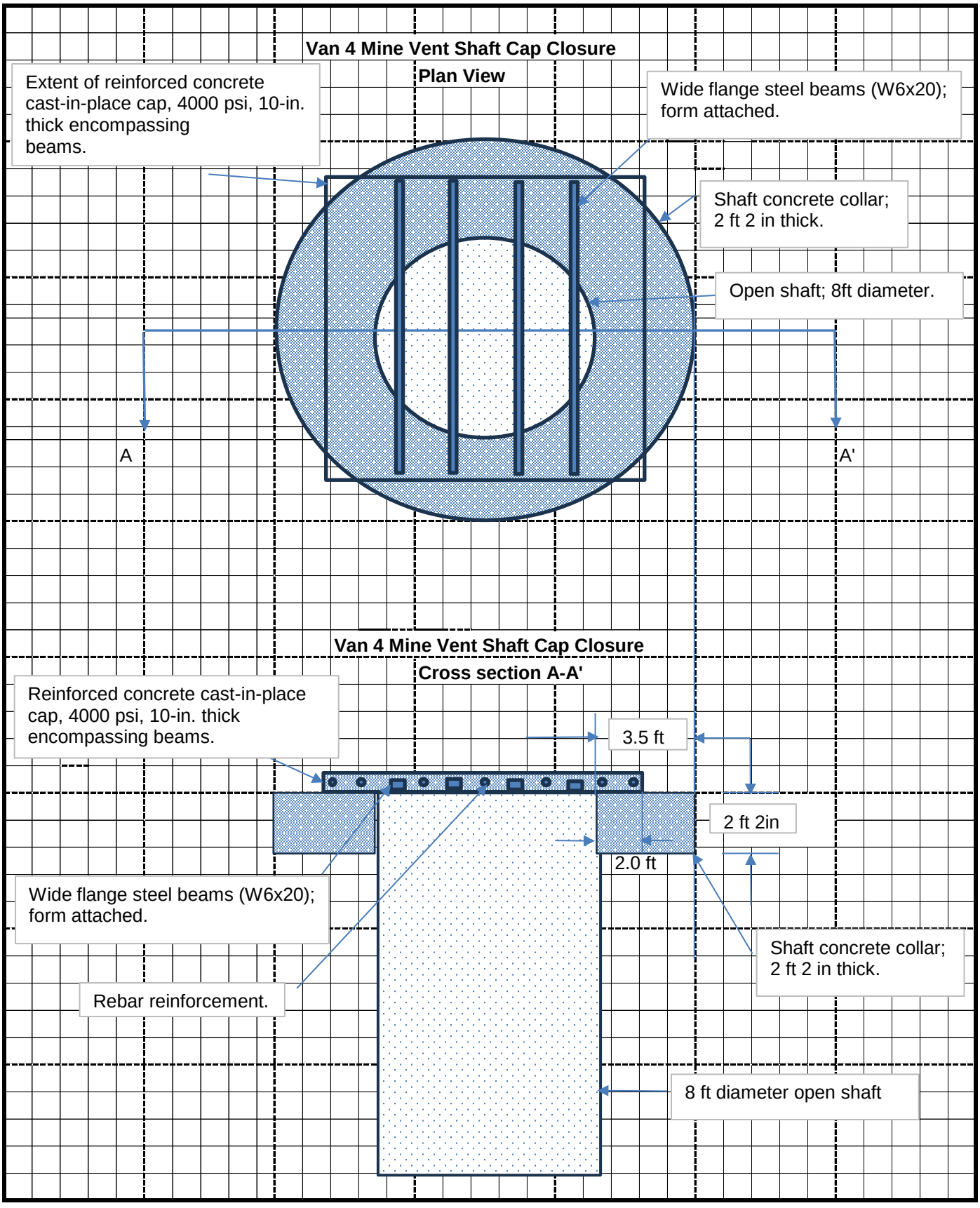

ATTACHMENT A

1997 Exhibit D – Reclamation Plan

SN

EXHIBIT D---RECLAMATION PLAN

D.1 General

At the conclusion of mining, all ventilation and production shafts will be back-filled, all structures removed, the waste dump recontoured and available topsoil spread over it to support vegetation. The direct costs are estimated to be $20,631 and the work is anticipated to take approximately one month. See Figure D-1 and Tables D-1 & D-2 for details of how the work would proceed.

D.2 Reclamation of the Van 4 Shaft and Ventilation Raises.

After removal of surface structures, the shafts will be backfilled with mine rock to within eight feet of surface. If low-grade piles exist on surface at the time of closing, this material will be used first to backfill the holes. Each hole will then receive a 5 foot minimum concrete plug, and then covered with at least one foot of topsoil. The area surrounding the hole will then be scarified and reseeded as out lined below.

D.3 Removal of Structures.

All surface structures including buildings, headframe, hoist, transformers, fences, company-owned power lines, fans and operation-related debris will be removed and sold for salvage, buried as allowed by law, or disposed of in a licensed landfill. It is anticipated that no sign of the Van 4 operations be left on surface other than a small surface expression of the waste dump.

D.4 Recontouring of Waste Dump

The waste dump will be recountoured to blend with the surrounding topography with the out slopes reduces to a slope of 3:1 or less. While it is not anticipated, any increase in the footprint of the dump due to slope reduction will be after any and all topsoil is pulled back from the edge for use as additional plant support medium. The crest of the dump will be fitted with a berm of at least one foot in height to prevent erosion of the slopes and water bars will be installed at regular intervals on the surface of the dump to retain moisture, trap sediments and control runoff. In addition to the above, a small ditch and berm will be constructed around the down gradient side of the dump to insure that no material leaves the site. The dump will then be covered with topsoil as available and reseeded as outlined
below.

D.5 Reseeding of Disturbed Areas

Areas disturbed by this mining operation will be covered with topsoil as available to expedite revegetation. Roads that have been used in conjunction with the operation will be scarified prior to seeding and water bars installed as necessary to prevent erosion. Every attempt will be made to leave existing large shrubs and trees in place. All areas to be seeded will either be scarified with a harrow and a small tractor, imprinted or otherwise roughened prior to seeding to hold the seed and retain moisture.

Seeds will be broadcast and raked or harrowed after application. The seed mix used will be as approved by the Division at our mines in San Miguel county and will include the following native species:

COMMON SPECIES NAME	LBS/ACRE
Sand Dropseed	0.20
Indian Ricegrass	1.50
Western Wheatgrass	2.50
Slender Wheatgrass	6.00
Four Wing Saltbrush	5.30

ATTACHMENT B

PHOTOGRAPHS

Photo 1. Van 4 Mine production shaft and concrete slab collar, looking southeast.

Photo 2. Production shaft and concrete slab collar, looking west.

Photo 3. Metal grating covering production shaft.

Photo 4. Partially dismantled hoist on hoist pad.

Photo 5. Collection channels on hoist pad.

Photo 6. Hoist pad, looking east-southeast.

Photo 7. Small concrete pad (use not known).

Photo 8. Change house pad.

Photo 9. Small waste rock pile in mine operations area.

Photo 10. Stormwater runoff ditch and sediment basin south of mine operations area.

Photo 11. Main stormwater runoff ditch (swale) on southwest and west end of development rock area.

Photo 12. Top of development rock area, looking northwest.

Photo 13. Top of development rock area, looking north.

Photo 14. West face of development rock area, stormwater ditch at toe to left.

Photo 15. Hummocked surface from waste rock load dumps, west end of development rock area.

Photo 16. West end of development rock area, showing lower terrace (standing on upper bench).

Photo 17. Stormwater runoff swale at toe of development rock area.

Photo 18. Top soil stock pile on west end looking northeast.

Photo 19. Topsoil stock pile looking east.

Photo 20. North face of development rock area adjacent to topsoil stock pile, looking south.

Photo 21. Vent shaft, showing fan housing, metal plating, and concrete collar.

Photo 22. Vent shaft, investigating thickness of concrete shaft collar.

Photo 39.

Photo 23. Vent shaft exposed concrete collar surrounding shaft, 2 ft 2 in thick.

Photo 24. Inside view of vent shaft collar, steel corrugated ring still in place;

Burro Canyon Formation exposed below ring.

Photo 25. Power drop cable 40 feet west of vent shaft.

Photo 26. Vent shaft and power drop cable.