MEMO

ARCADIS Design & Consultancy for natural and built assets

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From:
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Date:
April 28, 2020

Arcadis Project No.:
30040266

Subject:
Technical Memorandum for Temporary Consolidation Waste Pile Design, Haystack No. 1 Mine Site, Section 19, Navajo Nation, Baca/Prewitt Chapter, McKinley County, New Mexico

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INTRODUCTION

During a January 7, 2020 site visit with the United States Environmental Protection Agency (USEPA), Navajo Nation Environmental Protection Agency (NNEPA), New Mexico Environment Department (NMED), BNSF Railway Company (BNSF), Arcadis U.S., Inc. (Arcadis), and the contractor (Iiná Bá, Inc.), a request was submitted to prepare a Technical Memorandum (TM) to summarize the design of a temporary consolidation waste pile located on BNSF-owned land in Section 19, T13N, R10W, McKinley County, New Mexico. The objective of this TM is to provide USEPA and NMED with a general understanding of Arcadis' approach to design and construction of the Haystack Mine Site No. 1 temporary consolidation waste pile and associated access road, pursuant to the Administrative Settlement Agreement and Order on Consent for Removal Action (AOC; Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Docket No. 09-2017-02 and Docket No. 06-02-17) executed between the United States Environmental Protection Agency and BNSF.

The scope of the TCRA work is described more fully in the final approved Removal Work Plan dated July 27, 2017 (Arcadis 2017). Highlights of the work are summarized in the paragraphs below.

PROJECT BACKGROUND

The Haystack Mine Site is located approximately 5 miles east of Prewitt, New Mexico, in and immediately outside of the southeast portion of the Navajo Nation (Figure 1), within a rural area of northwestern New Mexico. The Haystack Mine Site is atop the Haystack Butte, approximately 500 feet south of the Haystack Mountain and next to County Road 41. The Haystack Mine Site consists of three adjacent abandoned uranium mines (AUMs), including Haystack No. 1 AUM (Section 19, T13N, R10W), Bibo Trespass AUM (Section 13, T13B, R11W), and Section 24 AUM (Section 24, T13N, R11W). The AUMs include:

- *Haystack No. 1 AUM.* This AUM is situated primarily on BNSF owned land (Section 19), with a smaller northern portion on Indian Allotment land (Section 18).
- *Bibo Trespass AUM.* This AUM is located on land (Section 13) administered by the Bureau of Indian Affairs (BIA).
- *Section 24 AUM.* This AUM is located on Indian Allotment land (Section 24).

History

Mining-related activities occurred from approximately 1952 to 1981, under various persons and entities, and more than 400,000 tons of uranium ore were extracted. The Haystack Mine Site was reclaimed in the early 1990s through a combination of USEPA, U.S. Department of Energy, and private party coordination. The 1991 and 1992 USEPA Completion Reports concluded that reclamation was successful and reduced the radioactive contamination to background levels, which is protective of human health.

In 2017, an Administrative Settlement Agreement and Order on Consent for Removal Action (AOC; Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Docket No. 09-2017-02 and Docket No. 06-02-17; USEPA 2017) was executed between the USEPA and BNSF. The AOC requires BNSF to perform a Time Critical Removal Action (TCRA) at six areas within the Haystack Mines Site (Figure 2).

In July 2017, BNSF submitted a Removal Work Plan (work plan; Arcadis 2017) as required by the AOC (USEPA 2017). The work plan details remedial action for the six TCRA areas, and the construction of a temporary consolidation waste pile in Section 19. The work plan was approved by the USEPA in a letter dated February 14, 2018 (USEPA 2018). Per the approved work plan, waste rock, soil, and other material removed from the TCRA areas will be placed in a temporary consolidation waste pile on Section 19 as described below.

TEMPORARY CONSOLIDATION WASTE PILE DESIGN BASIS

The facilities to be constructed in Section 19, including the temporary consolidation waste pile and associated access road, are components of the TCRA work, as presented in the work plan. The facilities will remain following completion of TCRA work. This section explains the major work elements within Section 19 and the approach to performing the work. For reference, design drawings are provided in Appendix A.

Site Preparation

Arcadis will contact a private utility locator to identify subsurface utilities within the Section 19 work area. Arcadis's subcontractor, Iiná Bá, Inc., will contact the local one-call center prior to earthwork and will wait for clearance prior to breaking ground. Arcadis and Iiná Bá, Inc. will make note of aboveground utilities during the pre-construction surveys.

Iiná Bá, Inc. will place appropriate project signage for the purpose of maintaining traffic safety for local residents, subcontractor, and site visitor personnel, and maintaining site security. The facilities in Section 19 are intended for access and use only by Iiná Bá, Inc., Arcadis, and BNSF personnel. Visitors from other organizations or individual citizens may notify BNSF of their interest in access to Section 19, and the appropriate procedures will be implemented prior to enabling access.

Access Road and Drainage Improvements

A temporary access road will be outlined in Section 19, extending from a point of tie-in to the existing access road leading to individual residences (which is generally adjacent to the northern boundary of Section 19), to the temporary consolidation waste pile. The access road will have a width of 24 feet to safely accommodate standard haul trucks and other construction equipment in two-way traffic. This is a typical road width assigned for the type and size of construction vehicles to be used for the TCRA work.

The temporary access road will extend to and around the perimeter of the temporary consolidation waste pile, to ensure that construction and other vehicles can safely access and work within the waste storage area (Figure C-1 and C-2 of Appendix A). Any necessary clearing and grubbing will be completed, as well as placement of erosion-control measures, prior to stockpiling any excavated material within the area.

A swinging, lockable gate will be installed on the new access road, near its junction with the existing access road. The gate will be closed and locked at the end of each workday shift and will remain closed and locked following construction.

Temporary Consolidation Waste Pile

The proposed temporary consolidation waste pile was sited within an open area defined by a broad, shallow depression; such that there is limited potential for erosion and migration of waste and soil cover material from the temporary consolidation waste pile. The temporary consolidation waste pile is also sited at a significant distance from existing surface water drainages. The depth to groundwater at the site is uncertain, though the temporary consolidation waste pile is designed for positive drainage and support for a vegetative cover, to limit the potential for infiltration and percolation of precipitation.

The temporary consolidation waste pile will have a volume of approximately 1,700 cubic yards of waste and an approximate footprint area of 29,800 square feet. This volume is an estimate based on current gamma scans provided by USEPA. Arcadis will perform gamma scans of each TCRA area as soil is removed, to determine the final extent of excavation and volume of soil removed.

The foundation area of the temporary consolidation waste pile will be graded using conventional construction equipment, including bulldozers, graders, and/or front-end loaders to prepare the site for accepting TCRA waste. The soils excavated from each TCRA area will be transported and placed in the designated temporary consolidation waste pile footprint and spread/compacted using construction equipment.

When TCRA soils from the areas are transported and placed, the surface of the waste will be graded to a minimum slope of three percent, and maximum slope of 3H:1V. The surface will then be covered with a geotextile and nominal 18-inch thick soil cover that serves as a vegetative growth medium. The volume of the soil cover will be approximately 1,600 cubic yards. The compactive effort for the soil cover will be that which is achieved by operation of construction equipment to place the cover. The soil for the cover will be obtained from an off-site, commercial source. As with the TCRA waste, the soil cover slope will be a minimum of three percent, and a maximum of 3H:1V. This range in slope is expected to accommodate some minimal settlement over time, while maintaining positive surface water drainage to limit infiltration and percolation of precipitation.

The temporary consolidation waste pile plan and detail are shown on Figure C-2 of Appendix A.

Staging and Laydown Area

A conex container with dimensions 40 feet long by 8 feet wide, sanitary facilities, tool crib, and heavy construction equipment will be placed within a contractor work area that is connected to the primary access road to the temporary consolidation waste pile. The dimensions of the contractor work area are approximately 200 feet by 200 feet. The facility is shown on Figure C-1 of Appendix A. Localized grading will be performed so construction equipment can safely access and move around the area. Access will be restricted to the staging area and any construction areas during the removal activities. Contractor facilities and equipment will be removed at the end of TCRA work.

Revegetation

Upon completion of the TCRA removal activities, disturbed land area will be revegetated using a New Mexico native seed mix. The New Mexico seed mix for Zone 1 is included in Appendix B. Following re-seeding, no supplemental irrigation will be provided.

FACILITIES CONSTRUCTION

Permits and Approvals

Per the AOC (USEPA 2017), BNSF was informed by the USEPA that no licenses, permits, or statutory approvals are required to construct the temporary consolidation waste pile because this work is defined by the USEPA as a TCRA under CERCLA.

Erosion and Sediment Control

For erosion and sediment control, work will be conducted in a manner to minimize the potential for soil erosion and tracking of soils outside of Section 19 from equipment movement. Excavation will not be conducted during periods of excessive wind or heavy precipitation.

Straw wattles or hay bales will be utilized during construction to protect soil from erosion caused by significant precipitation and surface water runoff. The straw wattles or hay bales, and/or silt fences serve to reduce the velocity of sheet and channel flow as it enters a work area and to trap sediment in flows leaving a work area. In areas of larger channel flows, sand bags may be used to dyke upstream and intermittently through the channel to slow the velocity of water and to trap sediment.

To address potential wind erosion, active dust suppression measures will be used during construction to minimize generation of dust in areas of soil excavation and during transport and placement in the

temporary consolidation waste pile. Following placement of waste and the soil cover over the waste, the potential for wind erosion will be reduced by revegetation, including re-seeding and crimping of mulch into the upper few inches of soil cover. This methodology is standard practice for constructing and maintaining caps and covers.

The performance of installed controls and the need for additional controls will be evaluated during inspections of areas where excavation has taken place. If the inspections reveal the need to enhance existing controls or to install controls where none exist, the needed controls will be installed.

A Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the TCRA activities. Best practices outlined in the SWPPP will be adhered to during TCRA work.

Dust Control

Dust control measures will primarily rely on vehicle speed controls and the application of water on working surfaces during material removal, transport, and placement in the temporary consolidation waste pile. Dust control measures will be implemented to minimize migration of dust generated by construction activities. A Dust Control Plan is included in the work plan as Appendix C (Arcadis 2017).

Schedule

The TCRA work is projected to be initiated during the second quarter of 2020. Preparation of the temporary consolidation waste pile is expected to last approximately two weeks. An additional two weeks will be required to move the TCRA waste into the temporary consolidation waste pile and place the soil cover. In general, working hours will be Monday through Friday during daylight hours.

Construction Management

Arcadis will be BNSF's lead contractor for managing the TCRA construction work. An Arcadis Construction Manager will be assigned by Arcadis to coordinate daily work of Iina Ba, Inc., manage field health and safety compliance, internal and external communications, and maintain records.

TCRA soil removal, transport, and placement will be performed by Iiná Bá, Inc. A Construction Supervisor will be assigned by Iiná Bá, Inc. to lead construction crews. Iiná Bá, Inc. will provide the necessary basic personnel support facilities during implementation of the TCRA work.

Reporting

A completion report in the form of a technical memorandum summarizing the results of work will be prepared and submitted to USEPA,. The completion report will include gamma scanning results, an as-built drawing of facilities in Section 19, and photo documentation of construction.

During construction, weekly summaries of the status of work will be provided to the USEPA.

OPERATION AND MAINTENANCE

After removal activities have been completed, personnel and equipment will be demobilized from the site. Periodic inspections of the temporary consolidation waste pile area. Inspections will be at an annual frequency, most likely during the Fall. It is during this period when the seasonal vegetative growth on the cover and any effects of surface water runoff and erosion from the monsoon season would be most apparent. Any required maintenance of the fencing or cover will be defined during the inspections, and

subsequently addressed as needed. These requirements may be updated based on the final removal activities. Brief reports of the results of annual inspections will be provided to the USEPA.

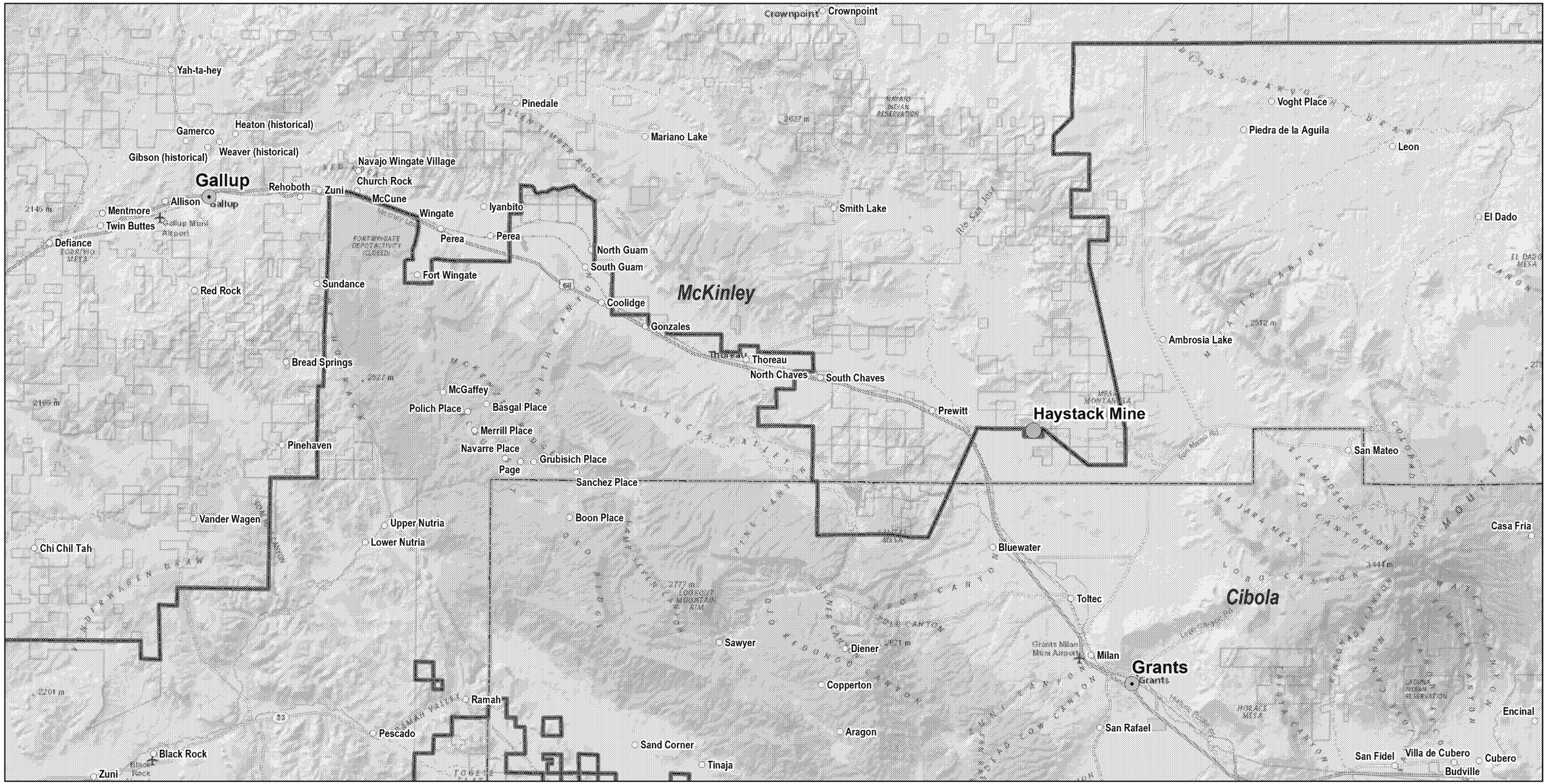
REFERENCES

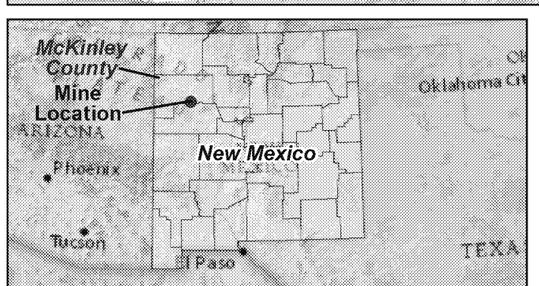
Arcadis. 2017. Removal Work Plan, Haystack Mines Site, McKinley County, New Mexico. July 27.

USEPA. 2017b. Administrative Settlement Agreement and Order on Consent for Removal Action, CERCLA Docket No. 09-2017-02 and CERCLA Docket No. 06-02-17. May 15.

USEPA. 2018. Re: Haystack Mines Site, Notice of Work Plan Approval. February 14.

FIGURES





Legend

- Haystack Mine Location
- Cities of Grants and Gallup Locations
- Surrounding Locations
- County Boundary
- Navajo Nation Boundary

0 5 10
Miles

Base Image Source: ESRI World Imagery 2016

BNSF
HAYSTACK MINE, NEW MEXICO

GENERAL SITE LOCATION MAP

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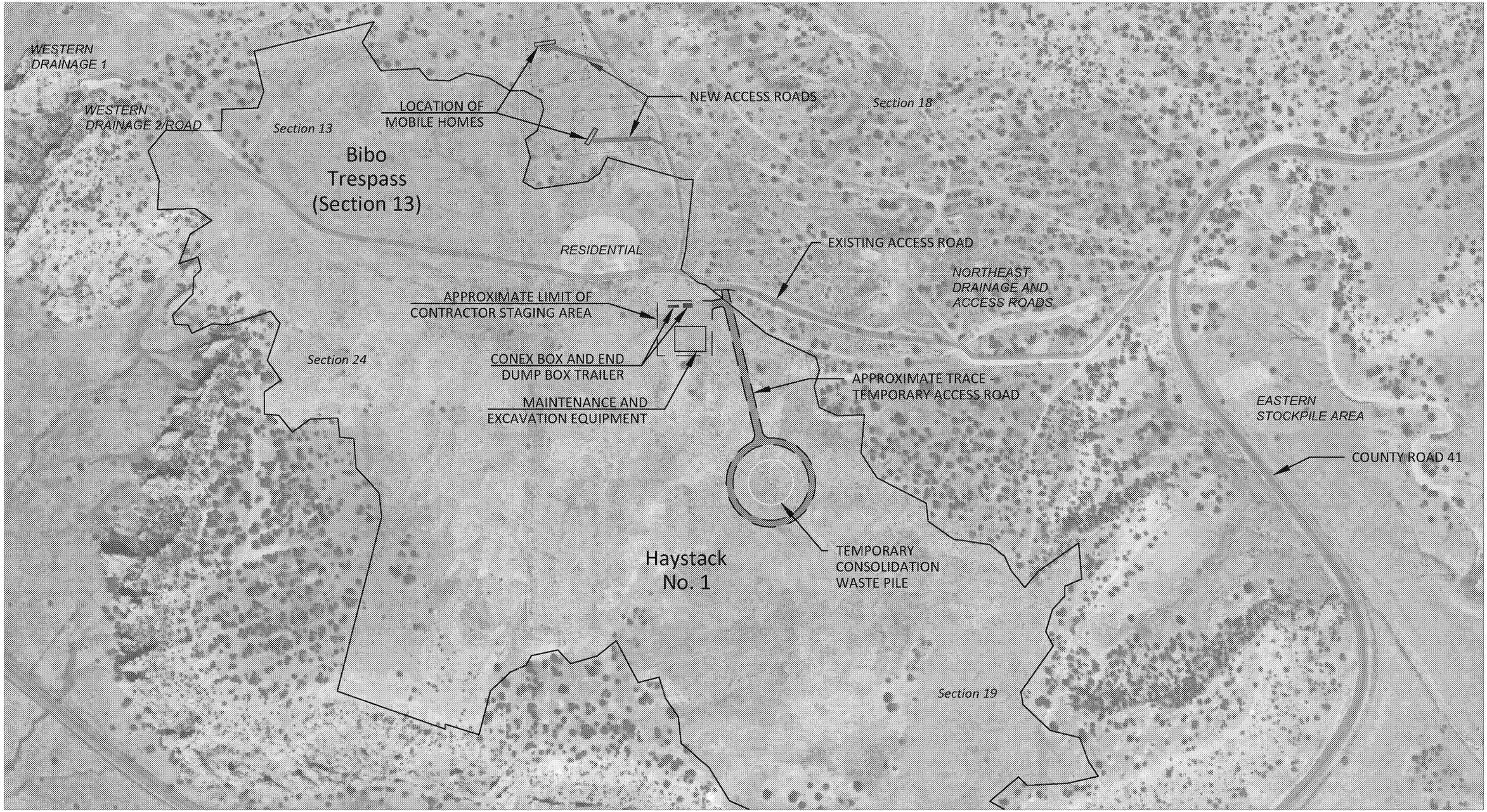
FIGURE
1

User: kgpeters Location: On-Site Citrix
Path: Z:\GISProjects_ENV\BNSF\BNSF_HAYSTACKMINE_NM\MXD\RemovalWorkPlan\Figure1_GeneralSiteLocationMap.mxd



Legend

- Abandoned Uranium Mine (AUM) Boundary
- Time Critical Removal Action Area (per AOC)
- Existing Access Road
- New Access Road
- Section Public Land Survey System (PLSS) Grid
- Location of New Residential Area
- Proposed Waste Pile
- Location of Contractor Facilities

N

0 400 800 Feet

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HAYSTACK MINE, NEW MEXICO
TCRA WASTE DISPOSAL FACILITY

SITE MAP

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FIGURE 2

PATH: C:\Users\mmcgonagle\ARCADIS\BNSF Haystack AUM - General\Site Map\Final Construction DWGs\HaystackMine_TCRA Site Map.dwg LAYOUT: SITE MAP SAVED: 4/21/2020 12:34 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: MONOCHROME.CTB PLOTTED: 4/21/2020 12:41 PM BY: MCGONAGLE, MORGAN

APPENDIX A

CITY: SAN RAFAEL, CA DIV/GROUP: ENVCAD DB: J. HARRIS
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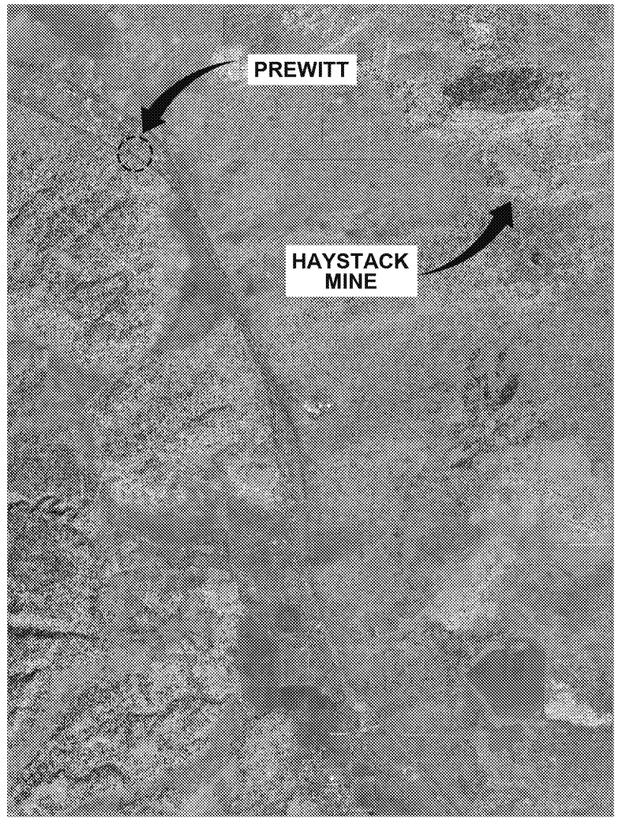
TCRA WASTE DISPOSAL FACILITY



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., PREWITT, MCKINLEY COUNTY, NEW MEXICO.

BNSF RAILWAY CO.
HAYSTACK MINE
PREWITT, MCKINLEY COUNTY, NEW MEXICO

APRIL 2020

ISSUED FOR CONSTRUCTION

KEY CONTACTS:

PROJECT SITE:
HAYSTACK MINE
PREWITT, MCKINLEY COUNTY, NEW MEXICO

ENGINEER:
ARCADIS
630 PLAZA DRIVE
HIGHLANDS RANCH, COLORADO
TELEPHONE: 303.471.3526
CONTACT: MIKE WINTER

OWNER:
BNSF RAILWAY COMPANY
740 E CARNEGIE DRIVE
SAN BERNARDINO, CA 92408
TELEPHONE: 909.386.4081
CONTACT: MIKE MAKEROV

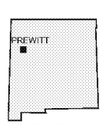
CONTRACTOR:
IIINA BA, INC.
1812 SCHOFIELD LANE
FARMINGTON, NM 87401
TELEPHONE: 505.327.1072
CONTACT: JOHN ISHAM

INDEX TO DRAWINGS

CIVIL
C-1 OVERALL SITE PLAN
C-2 CONSOLIDATION WASTE PILE PLAN AND CROSS SECTION

LOCATION MAP

0 4000 8000 Feet
GRAPHIC SCALE



NEW MEXICO

LEGEND

- TIME CRITICAL REMOVAL ACTION AREA (PER AOC)
- EXISTING CONTOUR - 1'
- EXISTING CONTOUR - 5'
- ABANDONED URANIUM MINE (AUM) BOUNDARY
- SECTION 19 BOUNDARY
- PROPOSED CONTOUR - 1'
- PROPOSED CONTOUR - 5'
- EXISTING ACCESS ROAD
- PROPOSED ACCESS ROAD
- NEW GATE

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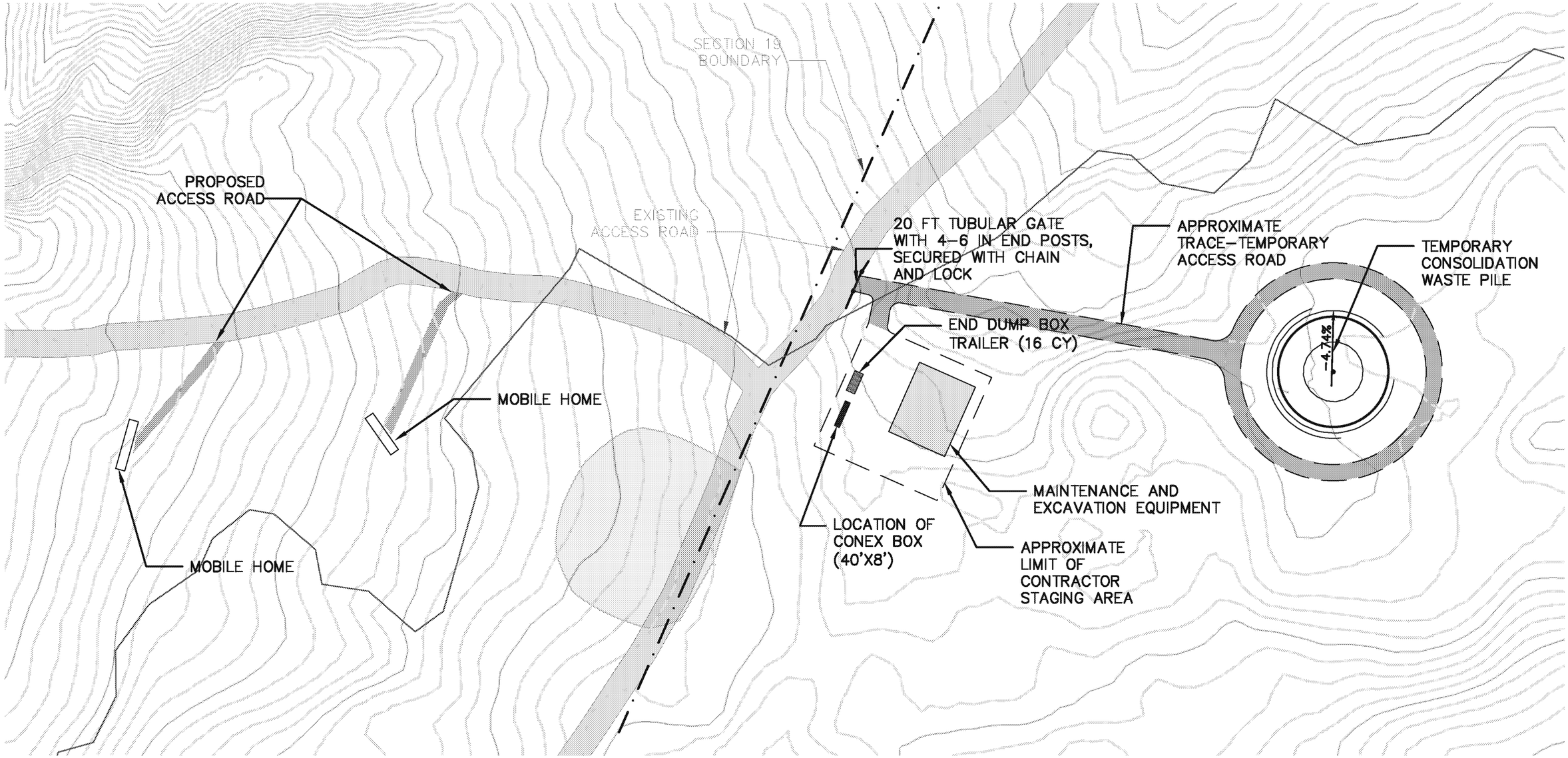

SITE PLAN

0 150' 300'

SCALE: 1" = 150'

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HAYSTACK MINE, NEW MEXICO
TCRA WASTE DISPOSAL FACILITY

OVERALL SITE PLAN

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FIGURE
C-1

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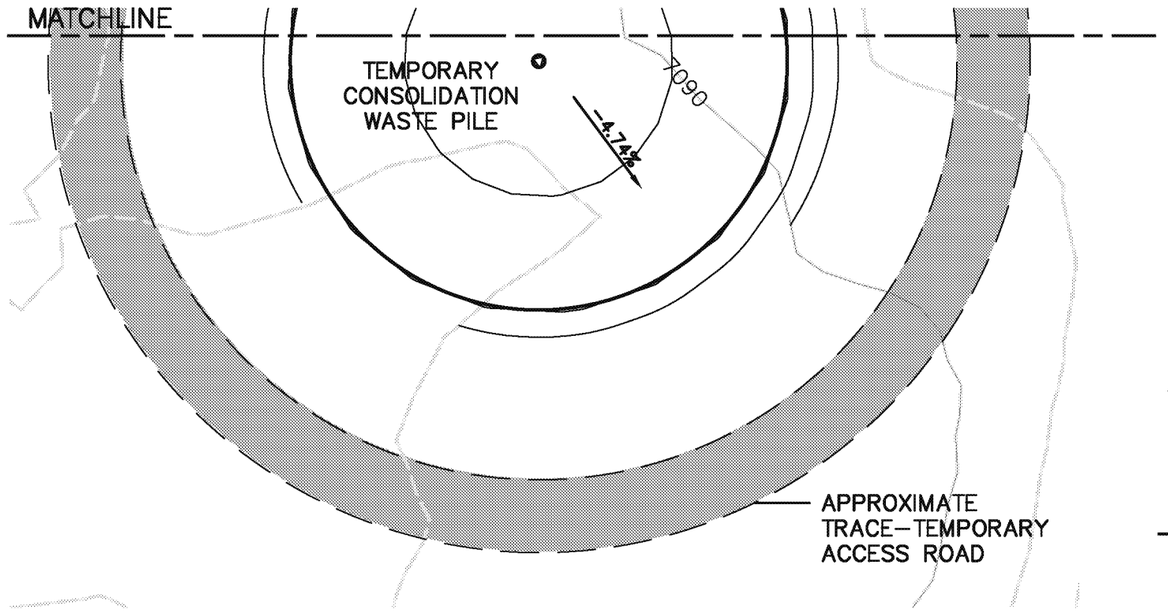
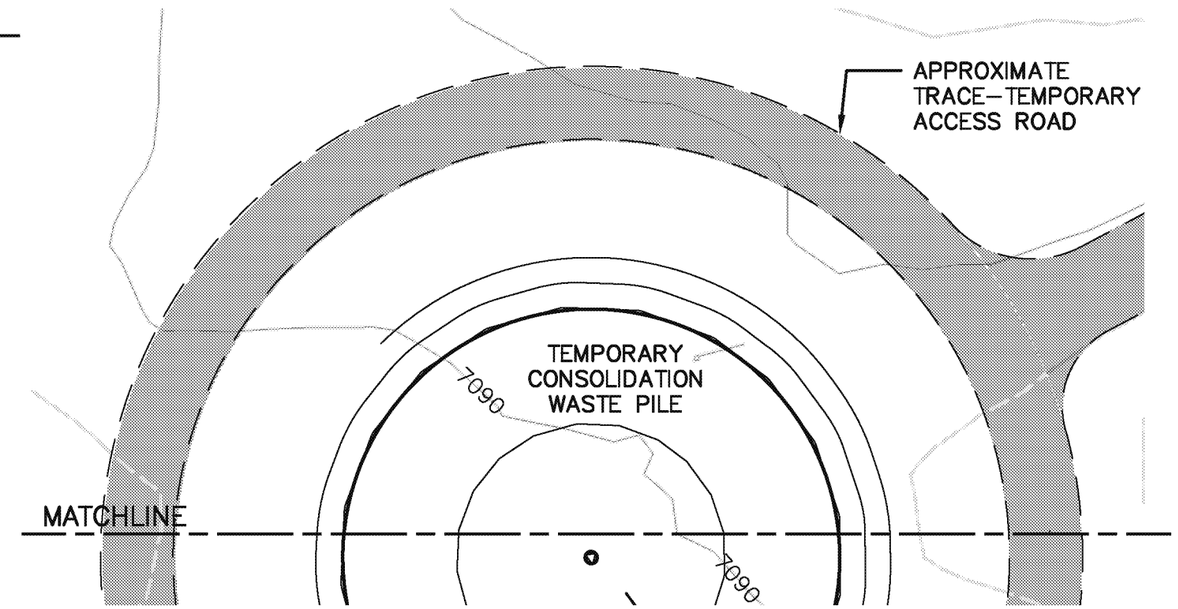
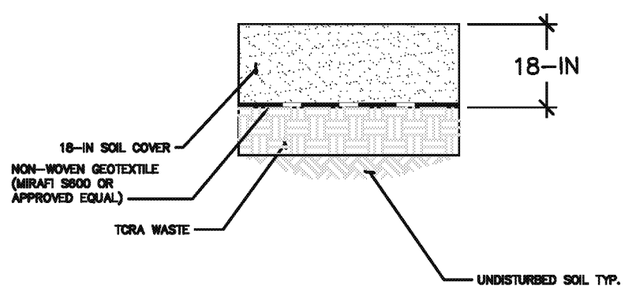


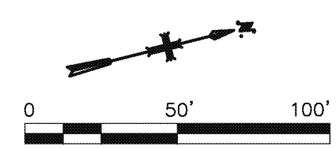


CONSOLIDATION WASTE PILE – PLAN



1 / C–2 CONSOLIDATION WASTE PILE DETAIL

NTS



SCALE: 1" = 50'

CONSOLIDATION WASTE PILE NOTES:

NOTES:

1. CONSOLIDATION WASTE PILE SHALL CONSIST OF EXCAVATED TCRA WASTE MATERIAL FOLLOWED BY THE PLACEMENT OF A NON–WOVEN GEOTEXTILE. FOLLOWING THE GEOTEXTILE PLACEMENT, COVER MATERIAL CONSISTING OF COMMON BORROW WILL BE PLACED IN AN 18 INCH THICK COVER TO ACHIEVE THE FINAL GRADING SHOWN ON THE CONSTRUCTION DRAWINGS.

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TCRA WASTE DISPOSAL FACILITY

CONSOLIDATION WASTE PILE PLAN AND CROSS SECTION

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FIGURE
C-2

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APPENDIX B

2017 Zone 1 Seed List: NM Plateaus and Mesas

Common Name	Botanical Name	Lbs of PLS*/Acre
Annual quick-cover grasses		
Oats	*Avena sativa*	0.50
Sterile triticale	*Triticum aestivum X Secale cereale'Quickguard'*	0.50
Cool-season grasses		
Bottlebrush squirreltail	*Elymus elymoides*	1.75
Indian ricegrass	*Achnatherum hymenoides* var. *Paloma***	0.75
Western wheatgrass	*Agropyron smithii*	1.75
Warm-season grasses		
Alkali sacaton	*Sporobolus airoides*	0.20
Blue grama	*Bouteloua gracilis* var. *Alma***	0.50
Galleta	*Pleuraphis jamesii* var. *Viva***	1.00
Little bluestem	*Schizachyrium scoparium*	0.50
Sand dropseed	*Sporobolus cryptandrus*	0.08
Sideoats grama	*Bouteloua curtipendula* var. *Vaughn***	0.75
Wildflowers		
Blanket flower	*Gaillardia pulchella*	0.20
Broadbeard penstemon	*Penstemon angustifolius*	0.20
Hairy golden aster	*Heterotheca villosa*	0.20
Lewis flax	*Linum lewisii*	0.20
Narrowleaf paintbrush	*Castilleja linariifolia*	0.02
Nelson globemallow	*Sphaeralcea parvifolia*	0.30
Prairie aster	*Machaeranthera tanacetifolia*	0.20
White prairie Clover	*Dalea candida*	0.20
Wild four o'clock	*Mirabilis multiflora*	0.30

Woody Shrubs

Antelope bitterbrush	*Purshia tridentata*	1.00
Four-wing saltbush	*Atriplex canescens*	0.40
Winterfat	*Krascheninnikovia lanata*	0.20
Sand sage	*Artemisia filifolia*	0.05

***PURE LIVE SEED/ACRE TOTAL**	**11.75**

**** Local, wild-sourced genotypes preferred. Provide specified registered variety only if wild-sourced seed is unavailable.**