Letter Work Plan

Downgradient Alluvial Aquifer Investigation & Installation of one additional Well
Fort Wingate Depot Activity
McKinley County, New Mexico

February 12, 2019

1.0 INTRODUCTION

This Letter Work Plan (now referred to as Plan) has been prepared by the U.S. Army per the request of New Mexico Environment Department (NMED letter HWB-FWDA -15-001) to outline specific procedures to further define the presence or absence of two independent alluvial aquifers in the vicinity of existing monitoring wells MW23 and MW24 and planned monitoring well BGMW11. In addition, this Plan proposes the location of one additional well east of TMW39D (as instructed by NMED in its letter HWB-FWDA-18-003). Upon approval of this Plan, the field effort will be conducted in conjunction with the field efforts for the approved FINAL Groundwater RCRA Facility Investigation (RFI) Work Plan, Rev. 4, 2018 (RFI Work Plan) (Sundance, 2018).

2.0 PURPOSE AND SCOPE

A Northern Area Groundwater Supplemental RCRA Facility Investigation Work Plan, was approved by NMED in July 2018 (final approval). In the April 2018 Approval with Modification letter, NMED stated they suspected that there may be two alluvial aquifers rather than one aquifer as stated in the RFI Work Plan. This Plan describes field activities that includes an outline of an approach to determine the presence of either a singular or multiple downgradient aquifers as well as a better delineation of potentiometric surfaces. This Plan also proposes the installation of one additional bedrock well east of existing monitoring well TMW39D. The primary purpose of the newly proposed bedrock well, TMW64, is to define the eastern extent of the perchlorate plume and to better delineate the potentiometric surfaces. Fieldwork under this Plan will be conducted concurrently with the RFI field efforts under the RFI Work Plan. The primary purpose of the newly proposed bedrock well, TMW64, is to define the eastern extent of the perchlorate plume and to better delineate the poteniometric surfaces. The fieldwork under this Plan will be conducted concurrently with the RFI field efforts under the RFI Work Plan.

For the purpose of delineating the two potential aquifers, one exploratory boring will be drilled between existing groundwater monitoring wells MW23 and MW24 to determine the presence or absence of two saturated zones. The boring will try to intersect the alluvial-Petrified Forest Formation (bedrock) interface (if present) to determine the presence or absence of this interface. The exploratory boring will be completed to approximately 150 feet or as needed to capture the alluvial-bedrock interface. If only one water-bearing zone is encountered, proposed background groundwater monitoring well BGMW11 will be installed as planned in the RFI Work Plan.

If two independent saturated zones are encountered, background monitoring well BGMW11 will be screened across the upper water bearing zone, and another background monitoring well, BGMW13, will be screened across the lower water bearing zone. A shallow groundwater

monitoring well, MW36, will be installed adjacent to MW23 to investigate the nature and extent of detected constituents in monitoring well MW23.

Upon installation, wells will be completed with a lockable well monument, a 4-feet by 4-feet concrete well pad, and four steel bollards. In addition, one bedrock well will be installed east of the existing bedrock well TMW39D. Section 5.0 of this document provides additional details.

3.0 SITE BACKGROUND

FWDA is located approximately seven miles east of Gallup, New Mexico and currently occupies approximately 15,277 acres of land in McKinley County, New Mexico (Figure 1). FWDA is mostly surrounded by federally owned or administered lands, including national forest and tribal lands. The major land use areas that overlay the study area consist of the following:

- The Administration Area – encompassing approximately 800 acres in the northern portion of FWDA, consisting of former office facilities, housing, equipment maintenance facilities, warehouse buildings, and utility support facilities.
- The Workshop Area – encompassing approximately 700 acres south of the Administration Area, consisting of an industrial area containing former ammunition maintenance and renovation facilities, 2, 4, 6-trinitrotoluene (TNT) washout facility and TNT leaching beds area. Buildings and related structures in this area were demolished in 2010.

4.0 SITE CONDITIONS

Climate – The average seasonal temperatures for the area vary with elevation and topographic features. During winter, daily temperatures fluctuate as much as 50 to 70 degrees Fahrenheit (°F) in a 24-hour period. In summer, daily high temperatures are between 85°F and 95°F (M&E, 1992). Average temperatures in winter are about 27°F and in summer 70°F, while extreme temperatures are as low as -30°F in winter and as high as 100°F in summer. There are 100 to 150 frost-free days during the year from the middle of May to the middle of October (M&E, 1992).

Topography – The study area is relatively flat with higher elevations to the south. Elevations in the northern area are approximately 6,660 feet above mean sea level. Surface runoff during rainfall/snowmelt events either drain into arroyos or pool in low-lying areas (where it evaporates or infiltrates). The Rio Puerco runs east to west along the northern border of the administration area and exhibits surface flow only during rainfall and snowmelt events.

Soils – The soils found in the study area are consistent with those occurring in cool plateau and mountain regions of New Mexico. The major soil types present at the FWDA are variants (complexes) of sands, loams, clays, and rocks. These soils are relatively thin and the parent bedrock is either at or near the surface in more than a quarter of the FWDA. The soils are generally as follows (south to north in direction): Rehobeth, Bamac, Aquima-Hawaikuh, Zia, Rizno-Tekapo, and Evark-Arabrab.

Geology – FWDA lies within a small basin defined on the south and east boundaries by the Zuni Mountains (Zuni Uplift), on the west by the Nutria Monocline, and north by South Fork of the

Rio Puerco (USGS, 2009). The Laramide Orogeny, occurring approximately 75 to 35 million years ago, contributed to the present basin configuration when Orogenic uplift tilted underlying bedrock to the northwest at an angle of approximately 5 degrees (USACE, 2011).

The northern boundary of the FWDA terminates in the strike valley Rio Puerco's South Fork. The valley represents the transition between the Zuni Uplift to the south and the Chaco Slope to the north. The Chaco Slope is a gently north-dipping slope between the Zuni Uplift and the inner San Juan Basin (USACE, 2011). The structural orientation of the bedrock and overlying alluvium substantially influences the movement of local groundwater near FWDA. The groundwater gradient in the uppermost bedrock units lies primarily to the northwest and west of the study area, generally following the structural dip of geologic units described (USACE, 2013).

Stratigraphy – Quaternary alluvial and colluvial deposits unconformably overlie the Triassic-age bedrock in the lower elevation and northern portions of the FWDA (Anderson et al., 2003). The Triassic Petrified Forest Formation underlays the alluvial and colluvial deposits in the study area. The Petrified Forest Formation comprises more than 75 percent (%) of the bedrock exposed at the surface throughout the FWDA and consists primarily of mudstone, claystone, and (minor) amounts of muddy sandstone. The Petrified Forest Formation consists of three members: the Painted Desert Member (upper), the Sonsela Sandstone Member (middle), and the Blue Mesa Member (lower). The upper Painted Desert Member and the lower Blue Mesa Member each consist of mudstone, siltstone, sandy-mudstone, and lenticular sandstone layers. Sandstone lenses within the Painted Desert and Blue Mesa Members are thin (generally less than 20 feet thick), laterally discontinuous, and contain high quantities of very fine, muddy matrix. Thus, the apparent permeability of these lenses and of the Painted Desert and Blue Mesa Members are very low.

5.0 FIELD METHODOLOGY

NMED has identified the need to determine the presence or absence of two potential alluvial aquifers east of the Administration Area and in the vicinity of monitoring wells MW23 and MW24. The data from this boring will be evaluated to determine whether to install background monitoring well BGMW11 as originally planned in the RFI Work Plan or install two additional background monitoring wells at the same location to capture different water bearing intervals. The borings and any temporary wells that would not be converted into permanent monitoring wells will be abandoned in accordance with New Mexico Office of the State Engineer regulations (OSE, 2017) and the NM Administrative Code (NMAC) 19.27.4.29 (NMAC, 2017).

The advancement of on exploratory boring between wells MW-23 and MW-24 that intersects the alluvial-Petrified Forest Formation (bedrock) interface. If soil cores collected from the boring visually indicate the presence of a confining layer between two saturated zones, the proposed method of investigation that is installation of wells and observation in differences in hydrostatic head and groundwater chemistry will be followed.

The A-E (Contractor) will mobilize an appropriate drill rig and support vehicles to drill the exploratory boring and install the groundwater monitoring wells at proposed locations. The boreholes will be drilled to specified depths. If two saturated zones are encountered, one permanent background monitoring well will be installed in each of the two water-bearing zones.

Otherwise, only one well will be installed in the sole water-bearing zone encountered at the proposed BGMW 11 background monitoring well location.

Soil cores will be contained in boxes and maintained onsite, thus eliminating soil investigation-derived waste (IDW).

The following section summarizes the permitting, field planning documentation, and specific field methods for installing monitoring wells and standards to be utilized for the performance of drilling and installation of the four proposed groundwater monitoring wells.

Permitting – Operations will be conducted in accordance with the OSE current guidance for drilling monitoring wells (OSE, 2017). The A-E will submit documents to the OSE, District 1, for review and approval to drill the proposed soil boring and groundwater monitoring wells prior to any work being done. The A-E will also collect global positioning system (GPS) coordinates of the proposed groundwater monitoring well locations to use in this (OSE) submission.

The A-E will also coordinate with FWDA caretakers to obtain utility clearance sign-off for the proposed groundwater monitoring wells per the GPS locations. The A-E's site representative will work with FWDA caretakers and USACE to ground-truth the proposed locations prior to commencing field operations. Notifications will be submitted to NMED, OSE, the Bureau of Indian Affairs, and White Sands Missile Range representatives prior to mobilization.

The A-E will submit a dig permit with New Mexico One Call, also known as NM-811. As this site is an Army Installation in closure, it is predicted that NM-811 will not have access or utilities within the boundaries of the FWDA; however, a proper submission will be conducted to verify no utilities exist at the proposed locations.

Operations will not be performed until a signed clearance has been received from the FWDA caretakers, and concurrence of the operations is received from applicable stakeholders.

Cultural Resources – Traditional cultural properties (TCPs) and other cultural resources have been documented within the FWDA boundaries. The USACE-Fort Worth District has developed a Programmatic Agreement (PA) to specify procedures to be employed during environmental characterization and remediation activities. These procedures will be followed during performance of field work.

Maps showing the locations of TCPs relative to proposed investigation locations are not included in this Plan due to public exhibition of this document. Instead, the consultation process will include review by tribal cultural resource personnel to confirm the presence or absence of identified cultural resources within the proposed investigation locations. During the Work Plan review period, tribal cultural staff may visit the site and meet with Army representatives to view figures showing sample sites as well as inspect the area for cultural resources. Specific sampling locations will not be flagged, but the sampling area will be identified.

Pursuant to the PA, the Army will provide a letter to the Pueblo of Zuni, Navajo Nation, and State Historic Preservation Officer seeking comments on field operating procedures prior to the commencement of fieldwork.

Field Planning Documents – Along with this Plan, the A-E will utilize the Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP) that will be prepared for the NMED approved RFI Work Plan. Upon approval of APP/SSHP, along with the corresponding accident hazard analyses, which will cover drilling operations as well as mobilization, vehicle operation, and groundwater sampling. The proposed locations are not located within areas of known ordnance operations. The requirement for Unexploded Ordnance support is not currently applicable.

Monitoring Well Installation – To determine the presence or absence of two separate alluvial aquifers, one exploratory boring between wells MW23 and MW24 will be installed to intersect the alluvial-Petrified Forest Formation (bedrock) interface. If the first step of the investigation indicates that only one aquifer exists in the vicinity, the Army will conduct original investigations as outlined in the Final Groundwater Supplemental RCRA Facility Investigation Work Plan, Revision 4, dated March 23, 2018.

If soil cores collected from the exploratory boring visually indicate the presence of a confining layer between two saturated zones, the following proposed method of investigation will be followed (Figure 2).

- The exploratory boring EB01 will be properly abandoned.
- The Army will advance a deeper boring in the vicinity of proposed well BGMW11. If both shallow and deep alluvial aquifers are distinctly present in the boring near well BWMW11, the Army will install a shallow and a deeper alluvial well that will be screened across the shallow and deeper aquifers at the proposed locations of BGMW13. These wells will be designated as BGMW13S and BGMW13D (Figure 2).
- The Army will install a shallow alluvial well and a deeper well in the vicinity of MW23 to determine if a shallow water bearing zone exists at this location and investigate the nature and extent of detected constituents in monitoring well MW23. These wells will be designated as MW36S and MW36D (Figure 2).

An appropriate drill rig will be used to continuously core the boring and advance surface casing through the alluvium to the confining bedrock layer. When the first apparent water-bearing zone is encountered, the casing will be pulled back slightly, a (groundwater) grab sample will be obtained for geochemical analysis (common cations and anions), and the hole will be left open (and monitored) over night to assess approximate static water levels. If stability is poor, a clean, new temporary casing and screen will be installed in the hole to facilitate measurements and sampling. A filter pack may be installed around the screen to protect the screen if judged to be necessary.

When the water levels have stabilized, water elevation will be appropriately measured, as well as a series of water quality tests (including pH, turbidity, and anions and cations determinations using USEPA (1993) Method 300.0 or SM 4500.0). Once such measurements are obtained, a second borehole will be advanced to the next anticipated depth and a similar procedure will be used to assess if a deeper water-bearing zone is observed. More specifically, substantial differences in head and geochemistry results will be considered primary evidence of separate aquifers. Similar head values and geochemistry results would support the presence of a single, though potentially thicker aquifer. At the end of this testing, the saturated zone will be isolated.

These wells will be installed in accordance with New Mexico OSE regulations (OSE, 2017) and the NMAC 19.27.4.29 (NMAC, 2017). The total depth may vary depending on the location of saturated zones.

The wells will be installed with 2-inch diameter Schedule 40) rigid polyvinyl chloride (PVC). Wells will be screened at the appropriate water bearing zones. Permanent monitoring wells will be installed with at least 10-feet of 2-inch diameter Schedule 40 PVC and 0.010-inch machine-slotted screen with a cap attached to the bottom. All materials used in temporary and permanent monitoring wells construction will not contain bis (2-ethylhexyl) phthalate or any other plasticizer to make them flexible. Screens will be installed throughout the thickness of the saturated and water-bearing zone, so screen intervals will vary. The filter pack will be clean, dry, silica sand (of size and gradation in accordance with New Mexico OSE regulations and the NMAC 19.27.4.29) that will be placed to extend from the bottom of the borehole to two feet above the screened interval. Above the filter pack, a bentonite chip or pellet seal will be installed with a thickness of approximately five feet and hydrated with potable water every one-foot to provide a competent seal. The bentonite chips or pellets will be installed by a tremie pipe. Above the bentonite seal, a neat cement grout will be installed from the top of the bentonite seal to three feet below ground surface. Grout will be placed by a tremie pipe that will be kept submerged in the grout as it is placed.

The surface completion for each groundwater monitoring well will consist of an 8-inch diameter by 6-foot long protective steel monument, which will be installed with three feet above the ground surface and three feet into the ground. The concrete pad will be 4-feet long by 4-feet wide by 4-inches thick. Field personnel will install 4-inch diameter by 3-feet tall steel bollards around the well on the outside of the concrete pad. An approximate well monument stick-up height of three feet is required to accommodate a potential dedicated pump system. The well will be equipped with a security lock and will be tagged with corrosion-resistant identification. The well monument will be coated with protective orange paint as required by FWDA.

Bedrock Monitoring Well east of TMW39D: A groundwater bedrock monitoring well (TMW64) will be installed at a suitable location in accordance with NM Office of State Engineer regulations (OSE, 2017) and the NM Administrative code, 19.27.4.29 (NMAC, 2017). The main purpose of this additional bedrock well east of TMW39D is to define the eastern extent of perchlorate plume in addition to delineating potentiometric surfaces more accurately. The new proposed monitoring well will be designated as TMW64. Anticipated depth for this proposed well is 100 feet bgs. This well will be screened from 80 to 100 feet. The proposed bedrock well depth will be determined based upon the review of the data from the nearby existing well such as TMW39D (Figure 3).

Field personnel will install a 2-inch diameter schedule 40 polyvinyl (PVC) groundwater monitoring wells with a 2-inch annulus. Monitoring well will be installed with at least 20 feet of 2 inch inside diameter, schedule 40 PVC 0.010-inch machine slotted screen with a cap attached to the bottom. Screen will be installed throughout the thickness of the target bedrock unit, thus screen interval may vary. The well will have centralizers placed at the top and bottom of the screen when appropriate. The filter pack will be silica and will extend from the bottom of the borehole to two feet above the screened interval.

Soil Sampling - The Core soil sampling will be conducted in a manner consistent with Soil investigations of the relevant borings as described in the *Final Groundwater Supplemental RCRA Facility Investigation Work Plan Revision 4.* Geotechnical soil samples will be collected from borings using a split-spoon sampler, and analyzed for fraction organic carbon, grain-size distribution, bulk density, and moisture content. Geotechnical soil samples will be collected to determine water-bearing zone characteristics. The Core soil sampling will be conducted in a manner consistent with Soil investigations of the relevant borings as described in the *Final Groundwater Supplemental RCRA Facility Investigation Work Plan Revision 4.*

Well Development – Completed alluvial and bedrock groundwater monitoring wells will be developed in accordance with New Mexico OSE (OSE, 2017) and the NMAC 19.27.4.29 (NMAC, 2017). The wells will be developed after a minimum of 48 hours the well installation is completed. Field personnel will develop groundwater monitoring wells by surge blocking, bailing, and/or pumping until the turbidity of the extracted water is less than 100 nephelometric turbidity units (NTU), if obtainable. As the water-bearing units at FWDA contain high volumes of fines and silts, a determination whether a well has sufficiently developed may need to be made in the field and authorized by the USACE's Project Manager.

Groundwater Sampling – Groundwater samples will be collected from the two new alluvial groundwater monitoring wells during approved RFI field efforts and subsequent April and October facility-wide sampling events, in accordance with the approved Interim Groundwater Monitoring Plan and will be consistent with the same analytical suite as the sentinel wells, MW23 and MW24. The sentinel wells are sampled for the following analytes utilizing the U.S. Environmental Protection Agency's (USEPA) *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (USEPA, 1993b).

- Explosives – USEPA SW-846 Method 8330B
- TCL VOCs – USEPA SW-846 Method 8260C
- TCL SVOCS – USEPA SW-846 Method 8270D
- TCL pesticides – USEPA SW-846 Method 8081B
- TAL total and dissolved metals – USEPA SW-846 Method 6010D/6020B/7470A
- Nitrate/nitrite – USEPA SW-846 Method 9056A
- Perchlorate – USEPA SW-846 Method 6850/6860
- PCBs – USEPA SW-846 Method 8082A

During the RFI field effort and subsequent two sampling events, wells will also be sampled for PCBs by USEPA SW-846 Method 8082A and herbicides by 8151A. If there are no detections of these analytes during the first two sampling events, these methods will be removed from the sampling suite for these wells.

Prior to purging and sampling, a minimum of 24 hours will elapse from the completion of development of a given groundwater monitoring well. Field personnel will purge groundwater monitoring wells prior to sampling using low-flow purging equipment or bailers until three consecutive readings are recorded for the following:

- ± 10% of temperature, conductivity, and oxidation reduction potential.
- ± 10% OR less than (<) 1.0 NTU for turbidity.
- ± 10% OR < 1.0 milligrams per liter (mg/L) for dissolved oxygen.
- ± 5% for pH.

Following well purging, field personnel will collect groundwater samples and submit the samples for analysis for the target contaminants of potential concern (COPCs) and parameters identified for the respective groundwater plumes related to the Interim Groundwater Monitoring Program for FWDA (Innovar, 2016). All supplies and equipment selected and used for groundwater sampling will be made of materials that do not contain phthalates. The contracted analytical laboratory will analyze samples in accordance with the project quality objectives and requirements of the most current version of the Department of Defense-Quality Systems Manual (DoD-QSM)

Field Documentation – Field personnel will maintain appropriate field documentation for all activities as part of the formal project documentation. Field sampling documentation and data reporting will provide sufficient information to verify report conclusions and demonstrate that quality control procedures were followed during implementation of proposed field activities.

A soil classification log will be used by the Field Geologist to log the drilled soil borings. The soil classification log conforms to industry standards and includes the following information:

- Project number
- Soil boring name/number
- Names of the drilling company and the operator
- Name of the geologist completing the log information
- Soil logging information
- Dates drilling begins and ends
- Observed drilling conditions (e.g., hard or soft drilling, rig chattering, sticky conditions, etc.)
- Location where samples were collected, sample ID, and time of collection

Each soil boring will be logged in accordance with American Society for Testing and Materials, (ASTM) Standards D-2487, D-2488, and D-653 (ASTM, 2006, 2009a, and 2009b). Soil descriptions and classification will conform to the ASTM Unified Soil Classification System.

Other documentation may be generated as a part of this field effort, and are listed below:

- Daily tailgate safety meeting forms
- Daily Field Logbooks
- Field Work Variances
- Sample collection logs

- Soil classification logs
- Equipment calibration records
- Sample labels/COC forms
- Photo documentation

Surveying – Following the field-sampling program, the groundwater monitoring well locations will be surveyed by a New Mexico-licensed professional surveyor to the nearest tenth of a foot (horizontal). The surveyor will measure elevations for the new monitoring wells at ground surface, top of the surface monument, and top of well casing (PVC) at points on the north side of the well to the nearest one hundredth of a foot (vertical).

Soil boring sample locations will be surveyed horizontally to the nearest one foot.

The professional surveyor will reference horizontal coordinates for all sample locations to the North American Datum of 1983, State Plane New Mexico West Grid represented in units of feet. They will also reference vertical coordinates for monitoring well elevations to the North American Vertical Datum of 1988, or NAVD 88.

Decontamination – Field personnel will perform decontamination of reusable sampling equipment to ensure chemical analyses reflect actual concentrations at sampling locations by maintaining the quality of samples and preventing cross-contamination. Field personnel will use the standard equipment decontamination procedures during completion of soil sampling activities, drilling activities, and between drilling locations. These procedures are as follows:

- Drillers will decontaminate drilling rigs prior to entering the study area. This consists of spray-washing or steam-cleaning dirt and debris from rig exterior and components and fully inspecting for any oil, hydraulic fluid, fuels, or operational fluid leaks. If any leaks are detected, the deficient rig will not be allowed onsite until the deficiency is resolved.
- Drillers will decontaminate drilling rigs and equipment between soil boring locations per the established decontamination procedures described in the NMED approved RFI work plan, also consisting of spray-washing or steam-cleaning dirt and debris from rig exterior and components.
- Field personnel will dispose of the plastic sheeting and associated pad materials at an approved on-facility dumpster.
- After field cleaning, personnel will don clean gloves before handling equipment to prevent recontamination. Personnel will move the equipment away from the cleaning area to prevent recontamination. If the equipment is not to be immediately reused, personnel will cover the equipment with plastic sheeting or wrap in aluminum foil to prevent recontamination. The area where the equipment is stored prior to reuse must be free of contaminants.

Investigation-Derived Waste Disposal – IDW will be managed in accordance with the Investigation-Derived Waste Management Plan as published in the *Parcel 3 Groundwater RCRA Facility Investigation Work Plan* (Sundance, 2016). IDW generated during the RFI activities will

consist of water produced from drilling activities; decontamination fluids; disposable sampling equipment; and personal protective equipment (PPE). Note that it is anticipated that no soil and rock IDW will be generated as all recovered material will be contained in boxes and maintained onsite, thus eliminating soil and rock IDW. These IDW categories will be managed as follows:

1. Large volumes of groundwater from drilling activities within water-bearing zones are anticipated. Field personnel will utilize portable water tanks to collect, manage, and characterize groundwater during drilling. The collected water will be stored for appropriate characterization and disposal.
2. Small volumes of decontamination fluids are anticipated. Decontamination fluids will be contained within the temporary decontamination pad areas during active sampling and decontamination activities onsite. Accumulated wash and rinse water will then be containerized and combined with produced waters related to drilling for appropriate characterization and disposal.
3. Used, non-decontaminated, disposable sampling equipment, and PPE is anticipated. Field personnel will place these items in polyethylene trash bags and treat as general refuse. Field personnel will place refuse in the suitable facility trash receptacle daily.

In the event IDW is characterized as a hazardous waste, it will be managed in accordance with the requirements of Large Quantity Generators of hazardous waste (USEPA, 1996), and the Investigation-Derived Waste Management Plan (Sundance, 2016).

The USACE PDT will coordinate with the on-site BRACD caretakers for all IDW management and disposal activities.

Final Report/Deliverable: The field efforts and the findings of this investigation will be incorporated into the Northern Area Supplemental RFI Report.

6.0 REFERENCES

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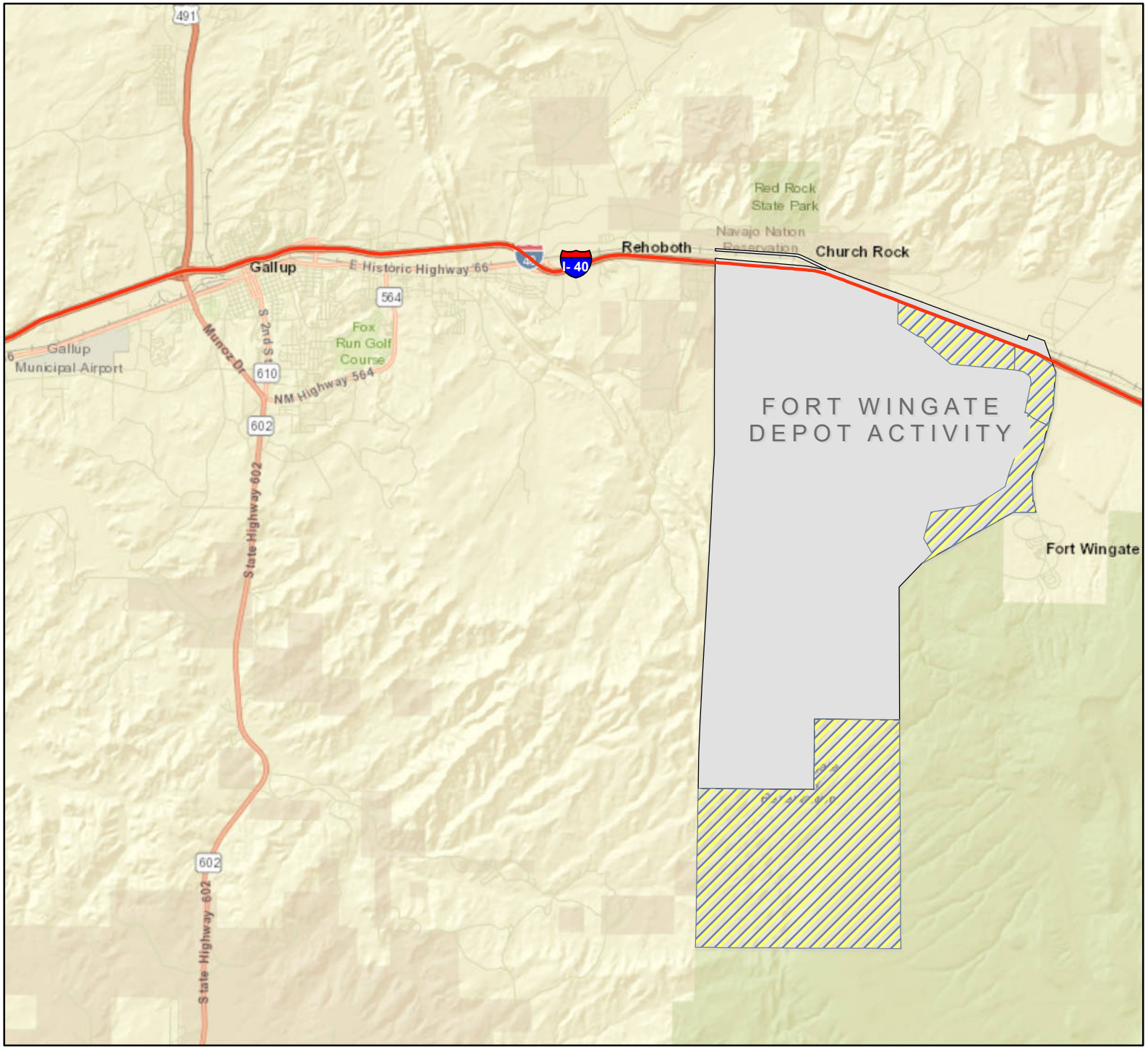
FIGURES



Legend

- Site Boundary
- Transferred Parcel
- Interstate 40

N
W E
S

0 1 2 3
Miles

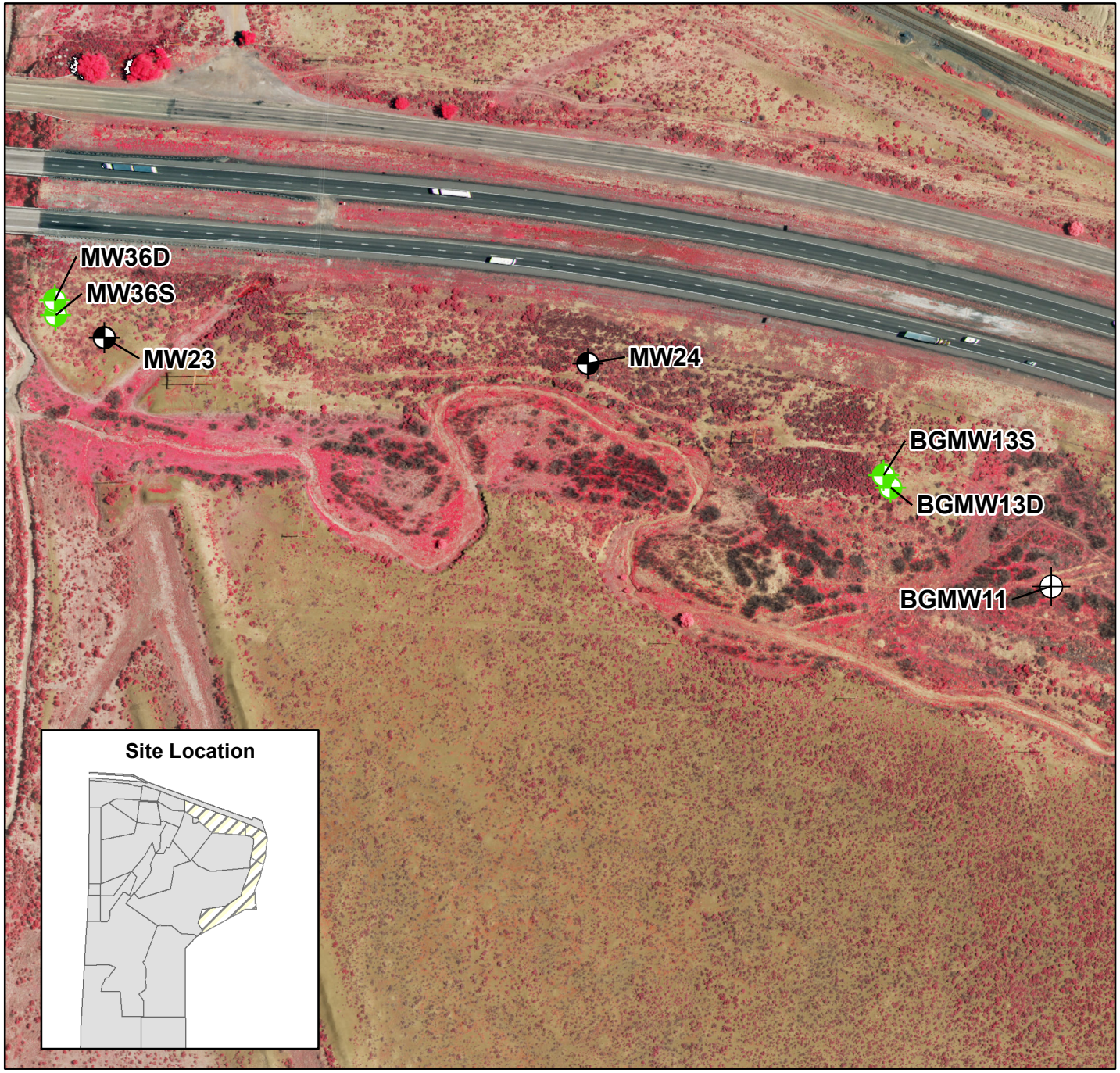
0 1.5 3 4.5
Kilometers

Figure 1

Site Location Map

Fort Wingate Depot Activity
McKinley County, New Mexico

Sundance
Consulting Inc.



Legend

- Proposed Monitoring Wells/Borings
- Proposed Monitoring Well (approved)
- Existing Monitoring Well
- FWDA Parcels
- Transferred FWDA Property

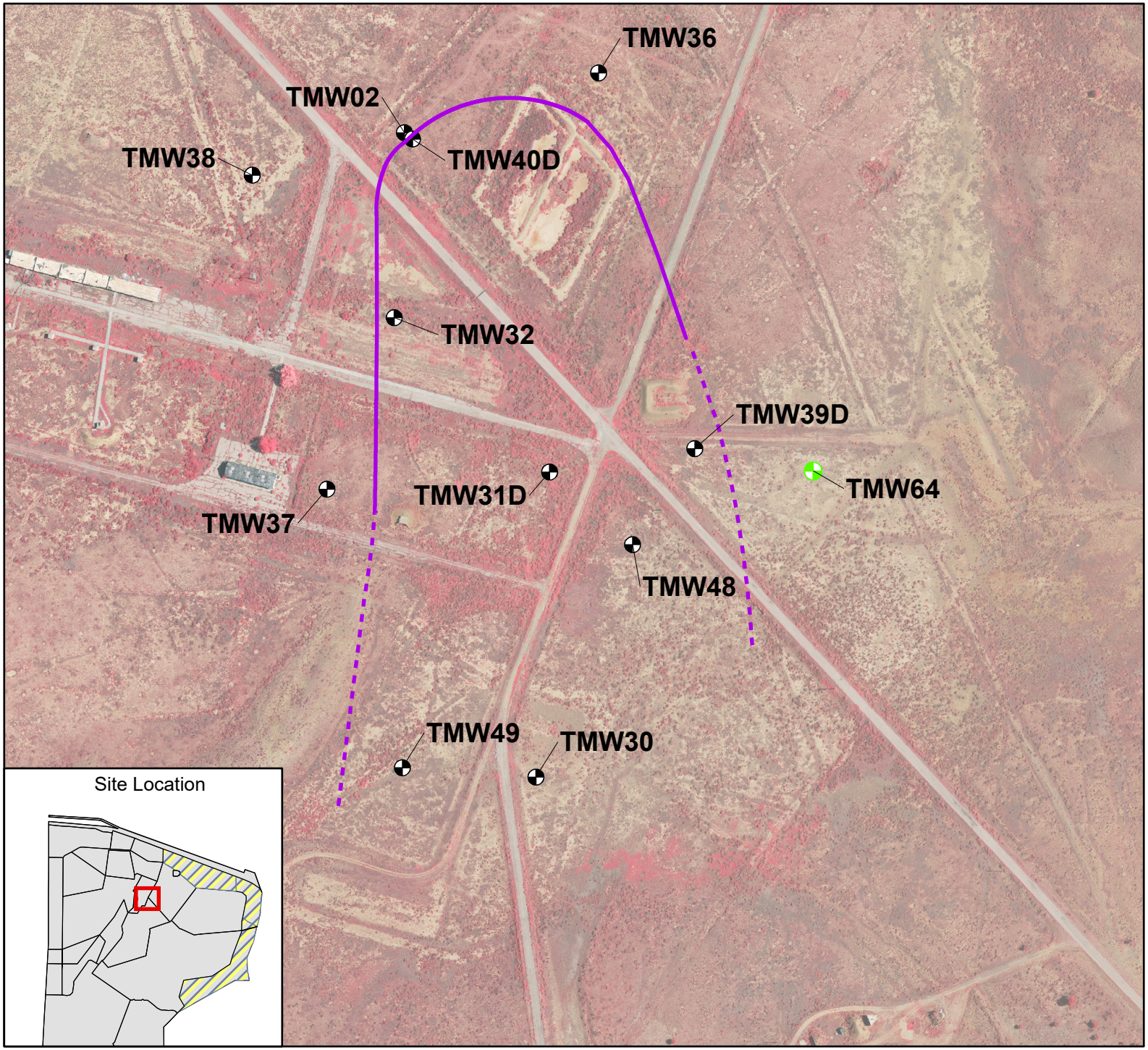
N
W E
S

0 115 230 460
Feet

0 30 60 120
Meters

Figure 2
Approximate Location of Borings/Wells

Document Path: \\abq-dc2\DataFiles\Fort_Wingate\FtWingateSundance_Project_Template\GIS\GIS_Projects\NE_NW_well_maps_for_JDN\Approximate_locations_borings.mxd



Legend

- Proposed monitoring well
- Existing bedrock monitoring well
- Site boundary
- Transferred parcel
- Perchlorate (15 µg/L)
- Inferred plume boundary

Note:
Bedrock Perchlorate Plume as of April 2018

N
W E
S

0 100 200 300 400 500
Feet

0 50 100 150
Meters

Figure 3

Proposed Bedrock Monitoring Well TMW64 Location Map

Fort Wingate Depot Activity
McKinley County, New Mexico

Sundance Consulting Inc.

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