FINAL
Operation and Maintenance Plan

North Ridge Estates Superfund Site
Operable Unit 1
Klamath County, Oregon

Contract No. W912DQ-15-D-3013
Task Order No: EC01

Prepared by:
CDM Federal Programs Corporation

June 2020

U.S ARMY CORPS OF ENGINEERS –
ENGINEERING DURING CONSTRUCTION
SEATTLE DISTRICT

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Acronyms

ACM	asbestos-containing material
bgs	below ground surface
CFR	Code of Federal Regulations
COC	contaminant of concern
CWCCIS	Civil Works Construction Cost Index System
ESCI	Environmental Cleanup Site Information
EES	easement and equitable servitude
EPA	U.S. Environmental Protection Agency
GIS	geographic information system
GSA	General Services Administration
HASP	health and safety plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IC	institutional control
ICIAP	institutional control implementation and assurance plan
MRB	Marine Recuperation Barracks
NCP	National Contingency Plan
NRE	North Ridge Estates
O&F	operational and functional
O&M	operation and maintenance
ODEQ	Oregon Department of Environmental Quality
ORS	Oregon Revised Statutes
OSHA	Occupational Safety and Health Administration
OTI	Oregon Technical Institute
OU	operable unit
OUNC	Oregon Utility Notification Center
RA	remedial action
RACR	remedial action closeout report
RAO	remedial action objective
RD	remedial design
ROD	record of decision
SEMS	Superfund Enterprise Management System
Site	North Ridge Estates Superfund Operable Unit 1 Site
USACE	U.S. Army Corps of Engineers
UU/UE	unrestricted use and unlimited exposure
UV	ultraviolet

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Section 1
Introduction

An operation and maintenance (O&M) plan has been prepared for the North Ridge Estates (NRE) Superfund, Operable Unit (OU) 1 site (Site), (Superfund Enterprise Management System [SEMS] # ORN001002476) in accordance with U.S. Environmental Protection Agency (EPA) *Guidance for Management of Superfund Remedies in Post Construction* (EPA 2017), *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites* (EPA 2012a) *Institutional Controls: A Guide to Preparing Institutional Control Implementation and Assurance Plans at Contaminated Sites* (EPA 2012b).

An O&M plan is required when an engineered control (i.e., protective cap) is employed to provide long-term protectiveness due to contamination remaining at levels that prevent unrestricted use and unlimited exposure (UU/UE). Implementation of this O&M plan will occur following the determination of operational and functional (O&F); however, portions of this plan (i.e., institutional controls [ICs]) were implemented as individual properties were completed.

Exposure to asbestos from asbestos-containing material (ACM) has been mitigated during remedial action (RA) (substantially completed in fall 2018) by excavation of surface soils and installation of protective caps across the Site during RA. This O&M plan was prepared to summarize monitoring, maintenance, and enforcement activities to ensure that institutional and engineered controls are in place and effective in providing long-term protectiveness.

An institutional control implementation and assurance plan (ICIAP) typically is a single, site-specific document developed to help ensure proper implementation and effective operation of ICs for their lifespan. Further, the ICIAP "is intended to serve as a single-source of concise site-specific IC information" (EPA 2017). In accordance with EPA guidance (EPA 2017), given the simplicity of the Site and the redundancy of roles and responsibilities for the IC life-cycle, elements of an ICIAP were included in this O&M plan to streamline the post-RA implementation of monitoring, maintenance and enforcement activities. This O&M plan covers both O&M activities and implementation of ICs.

This O&M plan will be updated by the Oregon Department of Environmental Quality (ODEQ) periodically if Site conditions change. In addition, the O&M plan appendices will be periodically updated to include other relevant and updated O&M and IC-related documents.

1.1 Statement of Basis and Purpose

Implementation of the O&M plan is designed to provide long-term assurance that the remedial action objectives (RAOs) as described in the Record of Decision (ROD) continue to be met. The RAOs, as presented in the ROD (EPA 2011), are as follows:

- Break the exposure pathways for inhalation of asbestos fibers that would result in unacceptable risk.

- Control the migration of contamination by natural and manmade transport mechanisms from source locations to unimpacted locations and media.
- Implement controls to prevent uses of the Site that could pose unacceptable risks to human health or the environment or compromise the remedy.

In addition, the ROD lists the Site-specific O&M objectives as the following:

- Maintain the integrity of the engineered controls and protective covers.
- Ensure that the protection of human health is maintained within the Site via monitoring (inspections and sampling).
- Implement, evaluate, and update ICs to ensure protectiveness.

The ROD also indicated that five-year reviews will be conducted indefinitely throughout the life of the Site since contaminants remain at levels that do not allow for UU/UE. O&M activities will be performed to monitor and maintain the integrity of the remedy that includes protective caps and ICs. O&M activities will be performed in compliance with the O&M health and safety plan (HASP). The following components will be considered as typical O&M activities:

- **Routine Site Inspections.** Routine non-intrusive visual site inspections will be conducted to ensure integrity of the protective cap. Site inspections will be performed at least annually and following severe storm events.
- **Cap Maintenance.** Damage to protective cap observed during routine Site inspections will be repaired, either by ODEQ or by others, to eliminate potential exposure of underlying contamination.
- **IC Evaluation and Updates.** ICs will be evaluated on at least an annual basis and updated, if necessary, to ensure protectiveness.
- **Reporting.** Routine reports summarizing O&M activities will be prepared on an annual basis. Routine reporting also involves regular review and updates as necessary to the O&M plan.

1.2 Operational and Functional Determination

Per the National Contingency Plan (NCP) at 40 Code of Federal Regulations (CFR) §300.435(f)(2):

> "*a remedy becomes "operational and functional" either one year after construction is complete, or when the remedy is determined concurrently by EPA and the state to be functioning properly and is performing as designed, whichever is earlier. EPA may grant extensions to the one-year period, as appropriate.*"

In accordance with the Superfund State Contract for the Site (ODEQ and EPA 2014), EPA and ODEQ will conduct a joint inspection after RA construction. A joint inspection allows EPA and ODEQ to determine whether the remedy has been constructed in accordance with the ROD and the remedial design (RD). The joint inspection may be conducted independently of, or concurrently with, the construction contract inspection. EPA and ODEQ will sign a memorandum following the joint inspection to document the date of inspection and the agreement of all parties that the O&F period has commenced. Following the 1-year O&F period, unless mutually extended,

(this period should also align with the 1-year warranty period at the Site following the third construction season), a final inspection will be performed to ensure that the remedy is functioning as expected. Upon EPA's written notice to ODEQ of EPA's acceptance of the completed project, the remedy at the Site will transfer from EPA to ODEQ as the lead agency for the O&M period. Exhibit 1-1 presents a summary of the major events for progress from ROD to the O&M period and associated dates of these events.

Exhibit 1-1. Summary of the Major Events and Dates for Progress from ROD to O&M

Date	Event
September 16, 2011	ROD for OU1 signed
January 2015	Final remedial design
July 2016	RA begins (assume 3-year construction schedule)
Fall 2018	Substantial completion of RA
Summer 2020	Final restoration inspection/joint site inspection/start of O&F period
Summer 2021 (Tentative)	O&F determination/start of O&M phase
Summer 2022 (Tentative)	First annual O&M report

Annual O&M site inspections, annual O&M reporting, and five-year reviews will be conducted indefinitely unless contaminants no longer remain at the Site at levels that do not allow for UU/UE.

1.3 Health and Safety Requirements

Following the transition to the O&M period and prior to any state-led work on site, ODEQ will develop an O&M HASP or adopt an existing HASP pertaining to the work required. This plan will include provisions for responding to and reporting accidents involving site O&M personnel, emergencies, and other unusual events such as fires, floods, or weather damage. The O&M HASP will discuss periodic site activities, including site inspections and maintenance work. The O&M HASP should be reviewed annually to ensure it is reflective of current site conditions and activities to be performed.

Work activities conducted during the O&F period will be covered under the RA contractor's HASP because these activities will align with the RA warranty period.

1.4 Training and Certification Requirements

Pursuant to Occupational Safety and Health Administration (OSHA), all persons engaged in on-site work activities under this O&M plan will follow OSHA regulations as specified in 29 CFR *Hazardous Waste Operations and Emergency Response* (HAZWOPER) 1920.120(e). In general, persons conducting O&M activities under this plan will have, at a minimum, 24 hours of initial HAZWOPER training and 1 day of supervised hands-on training, or a current 8-hour annual refresher. In some instances, 40 hours of HAZWOPER training may be required, which should be outlined in the O&M HASP.

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Section 2

Site Details

2.1 Site Location and Background

The Site is located approximately 3 miles north of the City of Klamath Falls, in Klamath County, Oregon, on Old Fort Road and North Ridge Drive (Figure 2-1).

The Site is named after the North Ridge Estates residential subdivision built on a portion of the property that is now included in the site boundary. The Site (shown as the yellow boundary line in Figure 2-1) encompasses the footprint of the former Marine Recuperation Barracks (MRB) and includes all areas where ACM and/or asbestos have been observed and/or detected except for the former firing range. Except for some incidental and/or localized contamination, the yellow boundary signifies the extent of the contamination and excavation activities to be performed during RA.

The Site largely comprises properties that are privately owned. The two on-site repositories, the common area, and all roads except Thicket Court are owned by Klamath County. Thicket Court is privately owned by an ownership group.

2.2 Site History and Previous Site Uses

NRE is a residential subdivision located approximately 3 miles north of Klamath Falls, in Klamath County, Oregon. The Site is contaminated with ACM resulting from the demolition of approximately eighty 1940s era military barracks buildings. OU1 of the NRE Site is located on Old Fort Road and North Ridge Drive and encompasses an area of approximately 125 acres.

Marine Recuperation Barracks (1944 to 1946)

The Site was originally developed in 1944 to create a facility to treat Marines suffering from tropical diseases contracted during WWII. The base was active from April 1944 until February 1946. The entire 745 acres were declared surplus property by the Navy in March 1946.

The MRB was composed of 82 buildings, including a sewage treatment plant, horse stables, warehouse, brig, medical officers' quarters, animal hospital, dependent hospital, post exchange, auditorium, gymnasium, swimming pool, fire house, mess hall, dispensary, laboratory, laundry, bakery, maintenance garage, bachelor's quarters, central power plant, library, and 30 barracks. Most of the buildings were constructed between Old Fort Road and the present-day North Ridge Drive. Many of the materials used for improvements on the Site contained asbestos, such as siding, roofing, floor tiles, and steam pipe insulation.

MRB buildings still standing today include a warehouse (Parcel MBK-G), the former brig (Parcel BM), which has been renovated into a five-unit apartment building, and several residences on Thicket Court used as officers' quarters during military use and as faculty housing during Oregon Technical Institute (OTI) occupation. Old concrete foundations for many of the other former MRB buildings were removed during RA.

Oregon Technical Institute (1947 to 1964)

The State of Oregon acquired the property in October 1947 to be used for the OTI (now known as the Oregon Institute of Technology). During OTI's occupancy of the Site, six structures were demolished. It is believed that material from the demolition of these structures was used by the OTI Superintendent of Facilities to repair and maintain other buildings on site. In addition, two new buildings were constructed adjacent to the maintenance garage during OTI occupancy. OTI moved from the Site in May 1964, having added seven new buildings and having acquired 40 additional acres of land.

General Services Administration (1964 to 1965)

Ownership of the Site was transferred to the General Services Administration (GSA) in December 1964 when OTI left the property. An inspection conducted by GSA in July 1964 showed the Site to be virtually intact; however, some buildings had fallen into disuse and were shuttered and boarded.

Private Ownership (1965 to 1977)

In 1965, a partnership of private individuals purchased the property from GSA. This private partnership owned the property until 1977. It is reported that while this partnership owned the Site, the owners stripped the vacant buildings of salvageable materials such as equipment, furnishings, copper, and wood. At least 22 buildings were demolished during the time this partnership owned the property.

MBK Ownership (1977 to 2006)

In December 1977, the property was purchased by MBK partnership for development. In 1993, Klamath County approved subdivision plans, and construction of homes began later that year. MBK sold properties in the subdivision from 1994 until 2002.

EPA conducted a series of emergency removals between 2003 and 2005 to reduce the volume of friable asbestos that had reached the surface due to frost heave and erosion. While large amounts of ACM were removed each year, the removals could not permanently eliminate unacceptable risks to residents of the Site. Residents were temporarily relocated for 3 months in 2005.

Receivership (2006 to present)

In January 2006, a federal consent decree was approved with parties, including the developer, the homeowners, the Department of Justice, and EPA. Most of the settlement cash compensated homeowners to allow them to relocate to new permanent residences. The consent decree also provided for a receiver to manage and hold title to the properties as a potential resource for funding cleanup activities.

Because of the January 2006 consent decree mentioned above, the NRE Site is comprised of a mixture of privately-owned properties and receiver-managed parcels.

2.3 Contaminants of Concern

This section presents a summary of the contaminants of concern (COCs) for each contaminated medium at the Site as presented in the ROD. As described below, asbestos and arsenic in soil are the primary COCs for the Site.

2.3.1 Asbestos

Asbestos is the main COC at the Site The main source of asbestos is ACM that was used in the original construction of the MRB. Common for the period, a variety of different types of ACM were used in the construction of the barracks, including cement asbestos board on exterior and interior walls (see Exhibit 2-1), asphalt-asbestos roofing material, vinyl asbestos tile, floor tile mastic, tar paper, and several types of asbestos steam pipe insulation (AirCell and magnesium silicate asbestos).

When buildings containing ACM were demolished, some of the ACM debris was consolidated into waste piles or burial pits, and the rest of the ACM was dispersed in surface and subsurface soil near areas where demolition occurred. During development of the NRE residential housing area, most of this ACM was covered or buried with soil, but some was left exposed. Over time, pieces of ACM in the shallow subsurface soil have appeared at the surface. This is believed to be due to repeated cycles of frost heave, surface soil erosion, and/or transport by water runoff. Once at the surface, the ACM can release asbestos fibers to surface soil and/or air, especially when the ACM and soil are disturbed.

Exhibit 2-1. Example of ACM Found On-Site

2.3.2 Arsenic

Arsenic is the only non-asbestos COC. The extent of arsenic contamination in soil above the background level is limited to an area of the former power plant (Parcel A). The arsenic contamination in soil at the former power plant area is co-located with ACM and/or asbestos contamination; therefore, the arsenic contamination found in these areas will be addressed during RA.

2.4 Remedial Action and Residual Contamination

In accordance with the ROD (EPA 2011), the final remedy required excavation of contaminated soil to approximately 2 to 4 feet below ground surface (bgs) and completely capping the Site area with a minimum 2 feet of protective cap. The protective cap is mostly comprised of a 2-foot soil cover with vegetation but also includes a variety of finished surfaces such as asphalt, concrete, gravel, riprap, and liners. The Site protective cap is designed to ensure long-term protectiveness from exposure to ACM (and arsenic at Parcel A), comply with applicable or relevant and appropriate requirements, and achieve the RAOs established in the ROD.

All RA work was performed in accordance with the RD (CDM Smith 2015). Work began in July 2016 and was substantially completed by October 2018. Following completion of the construction activities each season, a construction summary report was developed by the RA contractor. Each report provided a summary of work completed to date, residual contamination left in place, as-built conditions, and other monitoring results/quality control documentation.

As discussed previously, ACM and arsenic-contaminated soil may be present below the excavated depth. Given the risk that asbestos contamination poses to human health and the long-term persistence of asbestos in the soils, EPA took extra precaution to excavate as much contamination at the Site as possible and consolidate it within repositories to limit the chance of future exposure of contaminated materials within a parcel. Capping the remaining soils was an additional protective measure implemented in accordance with the ROD to ensure residual fibers left in the soils do not come to the surface in the future and pose risks. Regardless of the excavation of contaminated materials on each parcel, there remains the possibility that the excavation will not remove all asbestos fibers and/or contamination present. Asbestos fibers that might remain in the soils may still pose a risk to human health and ecological receptors.

2.5 Current and Future Land Uses

The current land use is residential, and it is expected that future land use will remain residential. The RD included engineered elements to integrate anticipated future residential use of the land. The selected remedy, as implemented in the development of the RD, employed the use of a protective cap to isolate contamination left in place or consolidate in on-site repositories and mitigate future exposure to asbestos. However, certain activities (e.g., off-road vehicle use) could compromise the protective cap. To limit such activities, land use restrictions and engineered controls, such as the placement of oversize rocks to limit access to certain areas, were installed to limit future land use and preserve the integrity of the cap. Land use or activities that would compromise the remedy will be considered unacceptable.

Section 3

Roles and Responsibilities

This section has been developed to define the role and responsibilities of various stakeholders who will be required to provide long-term site monitoring, either directly or indirectly, at the Site.

3.1 U.S. Environmental Protection Agency

EPA is responsible for oversight of O&M activities performed by ODEQ for the life of the expected O&M period. Specifically, EPA responsibilities during O&M include:

- Ensuring O&M reports are submitted
- Reviewing reports for required elements
- Ensuring maintenance activities are performed
- Fulfilling five-year review requirements

The level of EPA involvement may vary depending on the complexity of the Site. Further, the level may decrease over time as ODEQ demonstrates its capabilities to carry out the work.

3.2 Oregon Department of Environmental Quality

ODEQ is responsible for inspection, monitoring, and enforcement during the O&M period. ODEQ will be responsible for activities associated with routine inspections, including but not limited to monitoring remedy performance, inspecting the protective cap (and performing critical maintenance activities), and providing enforcement. Routine maintenance at the repositories and major breaches as a result of an act of nature will be the responsibility of ODEQ.

3.3 Klamath County

Klamath County is responsible for enforcing local regulations and bylaws and maintaining municipal infrastructure—such as roads, ditches, and culverts—in county rights-of-way. In addition, Klamath County will maintain certain site records (such as geographic information system [GIS] overlay as-built data, property titles, and deeds) and make them available to the public upon request.

3.4 Property Owners

Property owners are responsible for being good stewards of their property. This includes complying with all ICs (i.e., easement and equitable servitude [EES], notice of environmental contamination), maintaining the protective cap, and reporting any observed or potential issues. Property owners are responsible to inform anyone who may breach the protective cap, such as landscape contractors, of the potential presence of asbestos that remains in place and are responsible for informing ODEQ, through a formal notification process, of any work that may impact the protective cap. Following completion of RA activities, EPA and ODEQ have provided

each resident with maintenance instructions on how best to maintain the protective cap at their property.

Property owners will provide ODEQ access to their property for inspection of the protective cap in accordance with the EES. Any unusual activity or condition to the protective cap needs to be reported to ODEQ immediately, especially if it has potential to disturb asbestos-contaminated soil at depth.

3.5 Contractors and Utility Companies

Contractors and utility companies (including the City of Klamath) performing work within the Site boundary, including the right-of-way, are responsible to notify ODEQ of the work to be performed, especially when excavation work is expected to breach the protective cap (e.g., waterline repair). These contractors must complete the ODEQ Earthwork Notification and Reporting Form to ensure that ODEQ is informed of the work to be completed and that any potentially contaminated soil is managed and disposed of in accordance with local, state, and federal regulation, as directed by ODEQ.

Section 4

Site Inspection

Site inspections are conducted to monitor (through visual inspection) and document the condition of the protective cap to demonstrate that the remedy remains protective. The following sections summarize minimum requirements to perform Site inspections.

4.1 Inspections

On-site inspections are part of ODEQ's O&M responsibilities. During a typical site inspection, the ODEQ inspector will, in general, perform visual site inspections to ensure the protective cap does not have damages that could impact the remedy. In addition, ODEQ will review ICs and report whether these controls remain effective. Site inspections will be performed annually and concurrently with each five-year site review. Inspections should be conducted during the optimal growing season to facilitate inspection of the vegetation, which is generally between mid-June and mid-October.

Specifically, all on-site areas that do not meet UU/UE will be examined on a property by property basis, and results from the inspection will be recorded on an O&M inspection form. Photographic documentation of these areas is required, particularly where deficiencies are noted. During the inspection, GPS coordinates may be collected (when necessary) to locate where problems are encountered, especially those that may constitute a public safety or critical maintenance issues. It is encouraged that inspectors take photographs of the Site from similar vantage points each year to establish a long-term representation of Site conditions over a multi-year period. This will support evaluation of changes in Site conditions over time.

The O&M inspection form template is provided in Appendix A. This form provides a standardized way to monitor and inspect the Site. The forms should be completed for each property such that individual O&M property records can be readily accessed by the public.

4.1.1 Inspection of Protective Cap

A non-intrusive, visual inspection of the immediate ground surface of the protective cap will be conducted annually and following a severe storm event (see Section 4.2) to identity and assess for damages such as erosion (formation of rills or gullies), breaches from burrowing animals, or other damages to determine if exposure of ACM or debris has occurred. Damage caused by unauthorized use (i.e., off-road vehicle), should be monitored and reported, especially at the on-site repositories

ODEQ will review the construction as-built drawings and cap thickness figures (see Appendices B and C, respectively) prior to performing the inspection to identify areas where the protective cap may be less than 2 feet (e.g., legacy tree areas, along ditches, areas of shallow bedrock); a more focused visual inspection in these areas is recommended. Since the primary mechanism for ACM to surface is frost jacking, this focused inspection should include areas where contaminated source materials remain at depth. These focused inspection areas include, at a minimum:

- On-site repositories (Memorial Park and Swimming Pool)
- Where contamination was left-in-place (property areas where contaminated remains below 4 feet)
- Inside the dripline of legacy trees
- Along the perimeter of the site boundary, including the surface pickup area (i.e., Antenna Road) (see Figure 2-1)
- Along stormwater control and conveyance features (ditches and channel)
- Along steep slopes

Some surface water flow patterns in the protective cap are acceptable, but these should be small and infrequently observed. The movement of soil, rock, and plant litter must be considered low to moderate. There should not be any actively eroding rills or gullies. As a rule of thumb, rills, if present, must not be deeper than 2 inches and spaced at intervals over 10 feet. Gullies are defined as rills deeper than 6 inches. Areas where surface water flow patterns are more likely to impact the protective cap include steep slopes, the on-site repositories, and along drainage channels.

It should be noted that several existing buildings (e.g., Parcel MBK-G warehouse, Parcel BM apartments) have siding that may contain asbestos. The areas surrounding these buildings should be carefully inspected to determine the source of ACM if observed on the surface. ACM that originates from these existing building will be the responsibility of the property owner to remediate.

4.1.2 Inspection of Vegetation

4.1.2.1 Grass

ODEQ will assess the vegetated surface areas to ensure that the grass has been adequately maintained by the property owner (i.e., no signs of distress or dieback). ODEQ will inspect and ensure that sparsely vegetated areas do not total more than approximately 10 percent of a vegetated area and no individual bare area shall be greater than approximately 100 square feet. Sparsely vegetated areas are defined as having an average of less than approximately 80 percent cover of the original vegetated cover (i.e., approximately 20 percent dieback). Bedrock outcrops or boulders do not count toward bare ground.

4.1.2.2 Trees

ODEQ will assess the trees for obvious signs of overall health and record whether trees are showing signs of stress (i.e., browning leaves/needles) or whether trees have died. If the tree is dead, indicate if the removal of the trees will have a significant impact on the integrity of the protective cap (i.e., legacy trees or trees larger than approximately 20 feet).

Seedlings and other trees that have sprouted naturally on the repository caps should be removed to protect the underlying liners material.

4.1.3 Inspection of Miscellaneous Site Features

4.1.3.1 Stormwater Control and Conveyance Features

ODEQ will inspect stormwater control and conveyance features (i.e., ditches and culverts) to ensure these remedy features are functional. Verify that all ditches throughout the Site as well as culverts underneath driveways and roadways are free of dirt and other debris and are not obstructed by overgrown vegetation. Inspect the inlets and outlets of each culvert to ensure that erosion or other damages from severe storm events have not impacted the protective cap in those areas. Where riprap material has been used to provide an armored surface, verify that the riprap material has not been dislodged or displaced and remains effective.

4.1.3.2 Roads, Driveways, and Walkways (Paved Surfaces)

ODEQ will inspect roads, driveways, and walkways for signs of damage that could impact the integrity of the protective cap. Small cracks and deflections on the paved surfaces due to normal uses are expected. Verify that the road shoulders have not developed significant ruts from vehicle traffic (i.e., greater than 4 inches deep); minor damage from typical vehicle traffic and use is expected.

4.1.3.3 Crawlspaces and Covered Decks

To the extent practicable, ODEQ will verify that the crawlspace and covered deck liners remain in place with no signs of rips or tears that may expose soils beneath. Covered deck liners should not be exposed to ultraviolet (UV) light for extended periods; report areas where liners are exposed.

4.1.3.4 Access Controls

Access controls, such as boulders, fences, and gates, will be inspected by ODEQ to ensure they have not been moved or damaged. Access controls were engineered to prohibit unauthorized access to the on-site repositories.

4.1.3.5 Other Miscellaneous Inspections

ODEQ will verify that other miscellaneous features, such as newly installed fences, decks, gardens, or sprinkler systems, have not caused damage to the protective cap. Identify any areas where newly installed site features may have compromised or damaged the cap. Identify and report areas where unauthorized site grading activities may have occurred.

4.2 Severe Storm Event Inspection

If a severe storm event occurs (i.e., 50-year, 24-hour that equates to 2.8 inches[1] of rainfall over a 24-hour period), a site inspection will be scheduled within 1 week to assess damages. The inspection should include activities discussed in Section 4.1, with emphasis on drainage areas.

During the initial O&M period, it may be necessary to perform periodic inspection at the Site following smaller intensity storm events to gauge the sensitivity of the protective cap. The impact from storm events may change over time as vegetation continues to mature.

[1] Potential impacts from climatic change may alter the severity and frequency of these storm events. The criteria identified above for determining whether a severe storm event inspection is needed was based on the RD storm event and may be subject to change over time based on observations made during the O&M period.

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Section 5

Site Maintenance

The objective of the maintenance activities is to repair the protective cap from damages that may compromise the protectiveness of the remedy. Maintenance requirements may be influenced by the severity of weather, extent of site use, and or activities occurring on private property. The results from the Site inspection will inform the extent of maintenance and frequency needed.

Damage to the protective cap may result from vandalism, unauthorized digging, and/or erosion due to severe weather. Damage to the protective cap at the Site could lead to exposure to ACM that could result in an unacceptable human health risk hazard. In general, if asbestos is encountered or suspected while inspecting the protective cap, ODEQ will take necessary measures to secure the disturbed areas through restriction of access to the area and limiting contaminant migration from inadvertent activities so that the protection of human health is maintained.

All repair work will be completed with materials consistent with those identified in the O&M manual, and/or the RD specifications, and completed under the approved O&M HASP.

5.1 Corrective Action by Oregon Department of Environmental Quality

There is always a risk that an act of nature (i.e., flooding event) could cause a major breach of the protective cap and expose asbestos-contaminated soils beneath. Therefore, it is critical that ODEQ be involved with corrective actions following a major breach of the cap, which could impact remedy protectiveness.

A major breach may also require areas downgradient of the breach to be evaluated because of the potential for cross-contamination. Sampling may be required, at the discretion of ODEQ, to verify the extent of potential cross-contamination and/or effectiveness of the repair. A sampling and analysis plan/quality assurance project plan would also need to be developed to determine sampling methodology and data quality objectives needed to adequately characterize and assess the data. Contaminated soil or ACM displaced by a major breach will be excavated, managed, and disposed of at an approved facility in accordance with local, state, and federal regulations.

Corrective action to repair major breaches in the protective cap due to an act of nature generally will be the responsibility of ODEQ; however, if damages were caused by others through negligent activities, ODEQ, at their discretion, may seek compensation or other measures to repair the damages.

5.2 General Maintenance by Others

Routine maintenance of the soil cover, vegetation, and other miscellaneous site features, such as pavement, decks, or culverts, will be the responsibility of the property owner. In addition, the owner will be responsible for replacement of pavement and culverts on their property at the end of the site feature's functional lifespan.

5.2.1 Minor Cap Repairs

Minor repairs to the protective cap caused by rutting, depressions, rills, or other damages that do not result in the exposure of ACM or debris from below the protective cap will be necessary periodically. These types of repairs may include but are not limited to patching, resurfacing, or replacing growth media (with seed), gravel, asphalt, or riprap materials to repair rills, small washouts, or other damages. The urgency of these repair should be discussed by ODEQ with landowners following site inspections.

5.2.2 Cap Breach Due to Urgent Situations

Cap breach due to urgent situations may or may not result in the exposure of ACM and is not likely to occur frequently. Possible breaches that result in an urgent situation may include a waterline break or emergency repair to a septic system. In these situations, the property owner and/or utility provider should isolate the affected area (e.g., turn off the water supply). If the breach has compromised the protective cap, the property owner and/or utility provider must notify ODEQ. Once the situation has been assessed by ODEQ, depending on the severity of the situation, the property owner and/or utility provider will manage the repair to the protective cap, as directed by ODEQ. The owner and/or utility provider may be required to hire an asbestos abatement contractor to mitigate any ACM encountered if the work extends below the protective cap.

5.2.3 Vegetation

Vegetation (i.e., grass and trees) is a component of the remedy designed to provide a level of protection against erosion to maintain the minimum cap thickness and proper site drainage.

Maintenance of seeded areas may include reseeding embankments and ditches from surface erosion, providing supplemental water during drought conditions, and protecting vegetated areas from unauthorized traffic. General maintenance of vegetation will be the responsibility of property owners and monitored by ODEQ. Information will be provided to homeowners to ensure that vegetated areas are adequately maintained.

5.2.4 Stormwater Control and Conveyance Features

General maintenance of stormwater control and conveyance features (i.e., ditches and culverts) will typically involve removal of accumulated dirt or other debris that may impact or impede the conveyance of stormwater. This work may also include redistribution of riprap to ensure that drainage channel erosion is limited. Much of this work will be coordinated between ODEQ and Klamath County, except for maintenance of drainage channels on private property, which will be the responsibility of the property owner.

5.2.5 Roads, Driveways, and Walkways (Paved Surfaces)

General maintenance of paved surfaces, such as roads, driveways, and walkways, may require minor patching and/or crack repair work. Sealing work may be performed at the discretion of the homeowner. Homeowners will be responsible for periodic driveway and walkway repairs, and Klamath County will be responsible for repair of roadways.

5.2.6 Crawlspaces and Covered Decks

General maintenance of crawlspace liners and liners under the covered decks will include patching small holes and tears in the liner material. Gravel already in place should be redistributed over areas where the liner under the covered decks is exposed to UV light. These repairs will be the responsibility of the property owner. Acquisition of appropriate patching material should be coordinated through ODEQ.

5.2.7 Other Miscellaneous Features

Newly installed fences, decks, gardens, sprinkler systems, or other features will be maintained such that their function and use does not negatively impact the protective cap. In general, these features should not affect potential ACM below 2 feet bgs.

5.3 On-Site Repository Maintenance

Maintenance at the on-site repositories will be consistent with maintenance activities described in Section 5.2; however, ODEQ will be responsible for this work. In addition, this work will include maintenance of repository access controls (i.e., boulders and gates designed to prohibit unauthorized uses at the repositories). Maintenance will include performing fence and gate repairs and repositioning boulders to prohibit repository access, as needed.

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Section 6

Identification, Selection, and Implementation of Institutional Controls

ICs are non-engineered measures designed to prevent or limit exposure to hazardous substances left in place at contaminated sites. ICs are considered an integral part of the remedy for the Site. Consistent with expectations set out in the Superfund regulations and policies, the selected remedy does not rely exclusively on ICs to achieve protectiveness; ICs are considered in concert with other land use controls to be consistent with the concept of layering.

ICs will be used to minimize risks posed from ACM in soils that remain under the cap and to ensure that the cap remains protective. These controls will continue to generally allow for current land use activities but will restrict those uses to prevent damage to the caps, liners, and on-site repositories installed during RA.

This section describes the IC instruments that have been identified and selected at the Site. IC instruments at the Site are expected to be in-place in perpetuity; therefore, termination elements are not discussed in the O&M plan.

6.1 Instrument Identification and Screening

ICs were identified and selected during stakeholder meetings based on relative effectiveness and implementability to ensure long-term protectiveness of the engineered controls. Table 6-1 provides a summary of the IC instruments that were evaluated at the Site.

ICs are required indefinitely as part of the remedy, so proprietary and governmental controls are ideal since they run with the land and are enforceable. The balance between long-term protectiveness and the reasonably anticipated future use at the Site was also considered during the identification and selection process.

EPA will continue to work closely with ODEQ, Klamath County, and the community to ensure that ICs, in conjunction with engineered controls, will be effectively implemented for long-term protectiveness. ICs primarily will impact the Site property owners, occupants, workers, and visitors by controlling and/or limiting intrusive activities on capped areas that could disturb contaminated soil.

6.2 Description of Category and Selected Instrument

The IC instruments that were retained for implementation at the Site following the identification and screening process are described further in this section. These retained instruments have been grouped by category (proprietary controls, government controls, and information devices).

6.2.1 Proprietary Control Instruments

In general, proprietary controls are private contractual mechanisms contained in a deed or other document transferring a piece of property and are used to restrict or affect the use of property. Proprietary controls involve the placement of restrictions on land use easements, equitable servitudes, and/or private covenants, conditions, and restrictions.

Proprietary controls provide for an orderly transfer of land usage. Proprietary controls also provide for the proper transfer of ownership so that land restrictions are clear when ownership changes. The controls may allow residential and recreational land use as indicated by local zoning but will limit uses that might create an exposure pathway or damage the remedy.

6.2.1.1 Easements and Equitable Servitude

An EES was selected to be used as a mechanism to establish use restrictions for properties at the Site. For each property within OU1, an executed EES was filed with the county records and will run with the land so that any future owners would take the property subject to the conditions of the instrument. Through such instruments, grantees, including ODEQ, may hold perpetual rights to enforce the conditions and restrictions of such instrument. The EES agreements will be legally established for each property (or portion thereof) that do not have UU/UE upon completion of RA. These agreements will limit the use of property to protect engineered controls and facilitate access to monitor, maintain, and repair engineering controls. These agreements will require the following conditions:

- **Easement:** The easement grants the right to access and/or use the real property of another without possessing it. Easements are helpful for providing pathways across two or more pieces of property such as right-of-way (easements of way) and easements of support (pertaining to excavations).
- **Engineering Control Use Restrictions:** These restrictions ensure that the cap (i.e., soil cover, riprap, gravel, asphalt, concrete, and/or liners) is not breached without proper authority.
- **Earthwork Restrictions:** Earthwork restrictions prevent new development, construction, or other physical changes to the property from interfering with the engineered controls implemented during RA.

Copies of each recorded EES for the Site are available at the Environmental Cleanup Site Information (ECSI) website (https://www.deq.state.or.us/lq/ECSI/ecsiquery.asp; search Site Name "NRE").

6.2.2 Governmental Control Instruments

Government controls are those controls using the regulatory authority of a governmental entity to impose restrictions on citizens or sites under its jurisdiction such as encroachment permits or imposing restrictions on land or resource use (EPA 2012a). Typically, these controls include changes in local zoning, permits, codes, or regulations.

6.2.2.1 Earthwork Notification and Reporting Form

An Earthwork Notification and Reporting Form would be completed by property owners or contractors to notify and inform ODEQ that a significant cap disturbance is anticipated and will be

managed appropriately. This notification would be separate from other existing city and county permits. This notification form would achieve protection by establishing requirements for personal protective equipment; temporary and permanent engineering controls; and potentially contaminated soil handling, storage and disposal procedures. Specific activities that may not warrant ODEQ involvement or special management requirements include:

- Shrub/tree planting
- Gardening/rototilling
- Fence post installation
- Shallow footing/slab-on-grade foundation
- Patio construction
- Sprinkler system installation/repair
- Retaining wall construction
- Underground utility installation/repair

The Earthwork Notification and Reporting Form is required for all proposed work near or below 2 feet bgs within 10 feet of the protective cap. Only contractors certified for asbestos abatement are qualified to disturb the soil below the protective cap. A copy of the Earthwork Notification and Reporting Form template is provided in Appendix D.

6.2.3 Informational Device Instruments

Informational devices provide information or notification to local communities that residual or contained contamination remains on site (EPA 2012a). These devices (such as state registries of contaminated properties, deed notices, and advisories) coupled with community awareness activities guide behavior to avoid or prevent exposures that may exceed health-based levels.

6.2.3.1 Notice of Environmental Contamination

A Notice of Environmental Contamination is unilaterally issued by ODEQ as a deed notice, consistent with Oregon Revised Statute (ORS) 465.200 et seq. The deed notice is added to the property's title and available upon request for property records. It is intended to inform prospective property purchasers about asbestos contamination associated with the parcel of interest. Notices of Environmental Contamination will mostly be used for properties along Thicket Court that have underground asbestos-contaminated steam pipe remaining but have not had surface excavation work performed during RA. Copies of the recorded Notices of Environmental Contamination are available at the ECSI website (https://www.deq.state.or.us/lq/ECSI/ecsiquery.asp; search Site Name "NRE").

6.2.3.2 Community and Contractor Awareness

A long-term community education and awareness program, to be administered by ODEQ, has been established by EPA and ODEQ to promote community involvement and develop awareness of ICs to be implemented at the Site. It is meant to ensure that current and future property owners are aware of potential risks associated with exposure to contaminated materials and to help these property owners understand how to mitigate their risks in the future and report

concerns. Community feedback is encouraged and essential to maintain a working remedy and protect the NRE community.

Following completion of RA activities at each property, informational packages were provided to each homeowner. Duplicates of these packages were stored by EPA and ODEQ. These informational packages included remediation completion information, as-built drawings, applicable IC documents, and other general maintenance instructions.

As part of community outreach, EPA established and manages the site webpage (https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1002476) as a source for information to the public regarding current activities at the Site.

Informational devices will also be available at the ECSI website (http://www.deq.state.or.us/lq/ecsi/ecsidetailfull.asp?seqnbr=2335) to answer questions or concerns about the remedy, asbestos, and ICs. Additional questions and concerns should be directed to the long-term site manager with ODEQ. Contact information will be provided at ESCI.

6.2.4 Supplemental Tools

Supplemental tools were also identified and will be used as necessary to support implementation of the ICs. The following supplemental tools were retained at the Site:

- **As-Built Drawings and Cap Thickness Figures.** The purpose of the as-built drawings and cap thickness figures are to provide documentation on the final remedial status, contamination left in place, and cap thickness details. The as-built drawings (see Appendix B) and cap thickness figures (see Appendix C) supplement implementation of community awareness.
- **Subdivision Replat.** The purpose of the subdivision replat was to re-establish property boundaries to facilitate transfer of future property ownership and delineate common use areas (i.e., repositories, common area) for long-term management. In addition, vacant properties were assembled with adjacent occupied parcels to prevent future construction and disruption of the cap.
- **Oregon Utility Notification Center (OUNC) Program.** The purpose of the OUNC program is to utilize an existing "call before you dig" notification system to inform ODEQ of potential excavation work. The OUNC program supplements implementation of community awareness and provide a valuable tool to support ODEQ enforcement activities.
- **County Database and GIS Overlay.** The purpose of recording the extent of residual contamination with the county database and GIS overlay is to establish a property records repository with Klamath County. These publicly available property records were filed with Klamath County Planning Department where this information could be used to inform new and existing property owners of extent of residual contamination as well as as-built conditions.

6.3 Instrument Implementation

The IC period will be fully initiated once the Site is determined to be O&F (see Section 1.2); however, several IC instruments, such as EES, were implemented as individual properties are

completed. Implementation of ICs has been grouped in the following categories to help identify areas that require different layering of ICs. Community awareness will be applied site-wide to ensure that IC knowledge is transferred to all community groups. Table 6-2 summarizes the distribution of ICs instruments to be implemented across the Site.

6.3.1 Private Properties

This IC implementation area is characterized by having RA work performed across the entire property or only a portion of the property. These areas that were remediated that do not achieve UU/UE would require ICs. Parcel BQ is the only exception since RAs completed at this parcel eliminated exposure pathways; therefore, providing acceptable level of risk for all land uses. The IC instruments applicable to private properties (either the entire area or only a portion) include the EES and the Earthwork Notification and Reporting Form. One exception is Parcel BI; since only a very small portion of that property was contaminated with a negligible amount of ACM, that property will only receive a Notice of Environmental Contamination. Figure 6-1 shows what portions of the Site are identified as "Private Property."

A surface pickup was completed along a service road (i.e., Antenna Road) south of the excavation completed on Parcel MBK-F. ACM found at this location included several isolated pieces along the road surface and is shown on Figure 6-1 (see Appendix B for legal description). Given the unique nature of this cleanup, an EES and the Earthwork Notification and Reporting Form would not apply at this location. Future site inspections should be performed to confirm whether residual ACM debris remain.

6.3.2 On-Site Repositories

This IC implementation area is characterized by areas where excavated contaminated soil and debris were placed during RA for permanent disposal. The IC instrument that would be applicable is an EES. Non-repair excavation, building, or other construction activities are prohibited on the footprint of the repository. Figure 6-1 shows what portions of the Site are identified as "Onsite Repositories."

6.3.3 Thicket Court Asbestos Pipe

This IC implementation area is characterized as the properties along the northside of Thicket Court where a buried intact asbestos steam pipeline is known to exist but was left in place. Surficial ACM and asbestos-contaminated soil were not found, so remediation was not required since there is no exposure and is currently protective. The IC instrument that would be applicable at these properties is the Notice of Environmental Contamination. Figure 6-1 shows what portions of the Site are identified as "Thicket Court Asbestos Pipe."

6.3.4 Right-of-Way

This IC implementation area is characterized by having RA work performed within the county right-of-way. Contaminated soil was remediated along portions of these areas (i.e., road shoulders, ditches) and beneath North Ridge Drive and Hunter's Ridge Road. The IC instrument applicable to county right-of-way areas include the Earthwork Notification and Reporting Form for contractors or utility companies. Figure 6-1 shows what portions of the Site are identified as "Right-of-Way."

6.3.5 Common Area

This IC implementation area is characterized by having RA work performed within the "common area" also identified as the relocated Memorial Park. Contaminated soil was remediated throughout this area. The IC instrument that would be applicable is an EES. Non-repair excavation, building, or other construction activities are prohibited. Figure 6-1 shows what portions of the Site are identified as "Common Area."

Section 7

Reporting Requirements and Enforcement

At a minimum, Site reporting will include inspection and maintenance reports, IC enforcement reporting, and five-year reviews. Five-year review reports will be completed by EPA on a five-year cycle and in accordance with *Comprehensive Five-Year Review Guidance* (EPA 2001b). ODEQ will submit reports on O&M activities to EPA on a routine annual basis and following severe storm events. EPA will review the reports on an ongoing basis.

7.1 Inspection and Maintenance Reports

Reports summarizing O&M activities will be prepared by ODEQ and submitted to the EPA remedial project manager by January 31 for O&M activities completed in the preceding calendar year. These reports will summarize inspections, maintenance work completed, actual costs for the reporting period, and budget for the next reporting period. In addition, regular updates to the O&M HASP, as-built drawings, and information from property owners will be provided when applicable.

These reports will assist EPA in considering the adequacy of the O&M program, the frequency of repairs, costs at the Site, and how these factors relate to determining and ensuring protectiveness of the remedy. Other key events should be documented to ensure that ICs remain effective, including:

- Changes in property sales or ownership
- Changes to property records
- New construction, demolition, grading, and tree removal activities
- Proposed changes to land use or zoning
- Required engineered control repair/maintenance with documented as-built drawings
- Identification or discovery of ACM on Site

7.2 Institutional Control Enforcement Reporting

IC enforcement consists of methods for addressing issues related to improper or incomplete implementation of ICs, maintenance of ICs, and breaches of ICs. IC enforcement at the Site will be the responsibility of ODEQ.

Upon any violation of any condition or restriction contained in the EES, the State of Oregon and the United States may enforce the EES through any available means, seeking any available legal or equitable remedies. For the State of Oregon, such means may include available legal or equitable remedies to enforce this EES as set forth in ORS 465.900.

The most effective method of enforcement is early problem identification and communication. This can include site visits and issuing letters or notices to provide documentation of the problem.

7.3 Five-Year Reviews

Five-year site reviews will be performed because contaminated soil is left in place below the protective cap, preventing unrestricted use of the Site. EPA is responsible for performing and funding the five-year reviews. The five-year review process consists of six components: (1) community involvement and notification, (2) document review, (3) data review and analysis, (4) site inspection, (5) interviews, and (6) protectiveness determination (EPA 2003) as follows:

- Community involvement activities will include notifying the community that the five-year review will be conducted, notifying the community that the five-year review has been completed, and providing the results of the review.
- Document review involves a review of all relevant documents and data to obtain information to assess the performance of the response action. Documents for review include but are not limited to the ROD (EPA 2011), annual O&M reports, and annual IC evaluations.
- Data review and analysis will involve a review of sampling and monitoring plans and results from monitoring activities, if applicable.
- Site inspections will be conducted to gather information about the site's status and visually confirm and document the conditions of the remedy, the site, and the surrounding area.
- Interviews may be conducted as necessary with local residents and county and city officials to gather additional information about the site's status or identify remedy issues.

When determining the protectiveness of the remedy, the five-year review will include a technical assessment to examine the following three questions to provide a framework for organizing and evaluating data and information and ensure that all relevant issues are considered when determining the protectiveness of the remedy:

- Is the remedy functioning as intended by the decision documents?
- Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?
- Has any other information come to light that could call into question the protectiveness of the remedy (EPA 2001a)?

According to the ROD (EPA 2011), the remedial components will be subject to continual re-evaluation as part of the five-year review to ensure protectiveness of the remedy into the future. This will include any re-evaluation based on possible improvements to the technology to detect asbestos in soils. The remedy will be re-evaluated in accordance with the review requirements of Comprehensive Environmental Response, Compensation, and Liability Act Section 121(c). Routine reports summarizing the five-year review will be prepared by EPA in accordance with the *Comprehensive Five-Year Review Guidance* (EPA 2001b).

Section 8

Operation and Maintenance Cost Estimate

As part of this O&M plan, costs were developed to estimate the site O&M activities. The O&M cost estimate was developed to provide EPA and ODEQ with a cost basis for establishing O&M activities, costs for routine and non-routine remedy maintenance, annual site inspections, and cost for five-year reviews, as described in this O&M plan.

8.1 Methodology and Organization

The basis for the O&M cost estimate is the selected remedy cost estimate prepared in 2013 for the RD. The selected remedy cost estimate was developed according to *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study* (EPA 2000).

The O&M cost estimate was prepared using the Micro-Computer Aided Cost Engineering System (MCACES) Second Generation (MII) software version 4.4.2 and Microsoft Excel. Microsoft Excel was used to present cost estimate summary and present value analysis. The detailed O&M cost estimate (cost summary, present value analysis, unit cost development table, and MII cost report) is presented in Appendix E. The estimate includes the following assumptions:

- The RD cost estimate was modified to reflect the scope as presented in this site O&M plan. New unit costs were developed as necessary to reflect the major O&M components and are summarized in the unit cost development table presented in Appendix E.
- The escalation rate used to adjust previous costs to current costs is based on the composite escalation index obtained from the U.S. Army Corps of Engineers (USACE) Civil Works Construction Cost Index System (CWCCIS), EM 1110-2-1304, 30 September 2019.
- Labor rates for craft, non-craft, and professional labor were updated using current wage reports from the Foreign Labor Certification Data Center Online Wage Library (flcdatacenter.com).
- A contingency of 20 percent is used, which includes 10 percent scope and 10 percent bid contingencies. The 10 percent scope contingency was applied to account for the uncertainty in the extent of the O&M needed. The 10 percent bid contingency reflects the unknown costs associated with implementing the O&M such as adverse weather conditions, materials costs, or unfavorable market conditions.
- Technical support and project management (by EPA and stakeholders) costs were included as markup and are based on the recommended range in *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study* (EPA 2000) and engineering judgement.

The O&M cost estimate consists of a unit cost development table/MII cost report, a cost summary, and a present value analysis. The unit cost development table/MII cost report provides the costs for individual O&M components, including routine inspections, maintenance of on-site

repositories, monitoring of institutional controls, and maintenance of major breaches of the protective cap. The cost summary includes annual O&M costs, other periodic costs for the long-term O&M, contingencies, and professional or technical services costs. A present value analysis of the estimated O&M cost was also completed using an assumed period of 30 years although the O&M will be conducted indefinitely throughout the life of the Site.

Present value analysis is a method to evaluate expenditures, either capital or O&M, which occur over different time periods. The single cost figure, referred to as the present value, is the amount needed to be set aside at the initial point in time (base year) to assure that funds will be available in the future as they are needed, assuming certain economic conditions. Inflation was first applied to annual costs prior to the present value analysis. Inflation was based on the USACE CWCCIS yearly composite cost index (weighted average). The discount rate for present value analysis was based on the real discount rate of 7.0 percent obtained from *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, (EPA 2000), Page 4-5.

8.2 Cost Estimates Accuracy and Cost Uncertainty

The O&M cost estimate was developed to be as accurate as the current information allows and is based on the assumptions presented in this plan. The cost estimate is expected to have an accuracy of +50 to -30 percent of the actual costs. This cost accuracy range is consistent with EPA's *Remedial Design/Remedial Action Handbook* (EPA 1995) for preliminary development of O&M activities and responsibilities. Currently, this cost estimate is considered an opinion of probable cost only, and further refinement of the cost estimate will be done after additional inputs are gained from the stakeholders.

The O&M cost estimate does not include potential programmatic costs associated with specific EPA or ODEQ contracting vehicles such as the EPA Response Action Contract or EPA environmental services and operations contract. These typical costs include program management costs, general and administrative costs, subcontracting costs, and fees.

8.3 O&M Cost Estimate

As stated above, this O&M plan presents a probable cost of O&M. The actual cost to the stakeholders may be lower, depending on whether the state can find cost efficiencies in implementing the O&M at the Site.

The detailed O&M cost estimate (cost summary, present value analysis, and MII cost report and backup) is presented in Appendix E. Exhibits 8-1 and 8-2 present a summary of the O&M costs.

Exhibit 8-1. Summary of Probable Operation and Maintenance Cost Incurred by ODEQ

O&M Component	Cost Type	Description	Cost
Routine Site Inspection, Monitoring, and Maintenance	Annual O&M Cost	Includes annual site inspection to inspect the integrity of all the components of the remedy put in-place; evaluation and update of the implemented institutional controls at the Site; and minor maintenance of on-site repositories. It is assumed that annual O&M cost would be incurred annually.	**$62,000/year for Year 1**
			$55,000/year for Year 2
			$52,000/year for Year 3 Onward
Major Cap Breach Maintenance	Periodic O&M Cost	Includes periodic costs for repairing major breaches to the protective cap at the Site. It is assumed that periodic O&M costs would be incurred every 15 years.	**$224,000/15 years**
Compensation for Damages	Periodic O&M Cost	Includes periodic costs for seeking compensation for damages to the remedy put in-place due to others' negligent activities. It is assumed that periodic O&M costs would be incurred every 10 years.	**$25,000/10 years**

Note:

1. Detailed costs and backup are presented in Appendix E.
2. Costs are rounded to the nearest $1,000.
3. Costs based on 2020 prices.
4. Costs presented are expected to have accuracy between -30 to +50 percent of actual cost, based on the scope presented.

Exhibit 8-2. Summary of Probable Five-Year Review Costs Incurred by EPA

O&M Component	Cost Type	Description	Cost
Five-Year Site Review	Periodic Cost	Includes costs for site visit, five-year site review report, and setting up a community meeting to inform the local community about the status of the Site.	**$39,000/5 years**

Note:

1. Detailed costs and backup are presented in Appendix E.
2. Cost is rounded to the nearest $1,000.
3. Costs based on 2020 prices.
4. Costs presented are expected to have an accuracy between -30 to +50 percent of actual costs, based on the scope presented.

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Section 9

References

CDM Smith. 2015. *Final Remedial Design. North Ridge Estates Superfund Site, Operable Unit 1*. December.

EPA. 2017. *Guidance for Management of Superfund Remedies in Post Construction*. OLEM Directive 9200.3-105. February.

EPA. 2012a. *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*. OSWER Directive 9355.0-89. EPA-540-R-09-001. December.

EPA. 2012b. *Institutional Controls: A Guide to Preparing Institutional Control Implementation and Assurance Plans at Contaminated Sites*. OSWER Directive 9200.0-77. EPA-540-R-09-002. December.

EPA. 2011. *Record of Decision for the North Ridge Estates Superfund Site, Operable Unit 01, Klamath Falls, OR*. September.

EPA. 2003. *Five-Year Review Process in the Superfund Program*. OSWER Directive 9355.7-08FS. EPA/540-F-02-004. April.

EPA. 2001a. *Operation and Maintenance in the Superfund Program*. OSWER 9200.1-37FS. EPA/540/F-01/004. May.

EPA. 2001b. *Comprehensive Five-Year Review Guidance*. OSWER Directive 9355.7-03B-P. June.

EPA. 2000. *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study*. OSWER 9355.0-75. July.

EPA. 1995. *Remedial Design/Remedial Action Handbook*. June.

ODEQ and EPA. 2014. *Superfund State Contract for North Ridge Estates Site, Operable Unit #1.* May.

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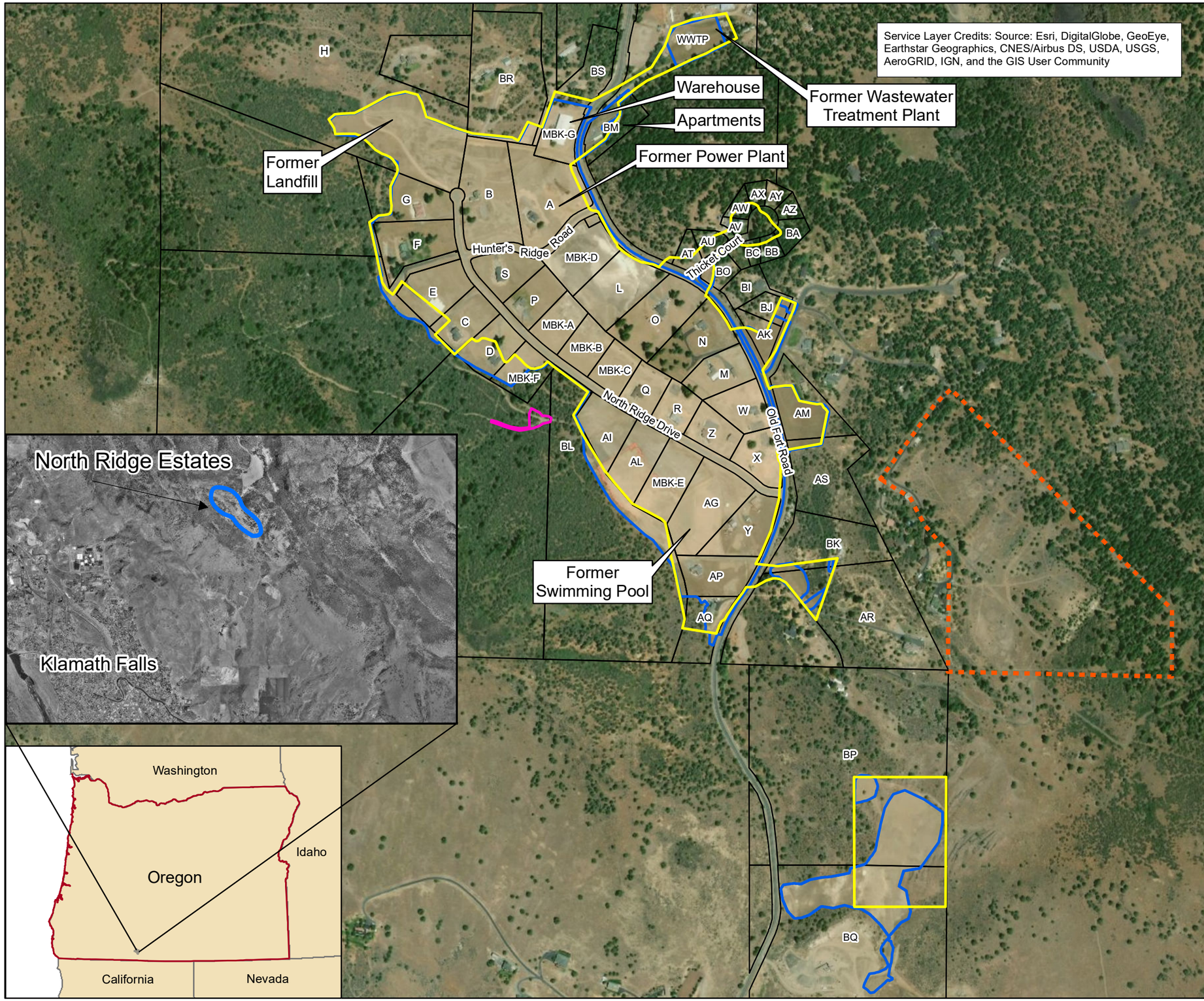
Figures



Legend

- OU1 - North Ridge Estates
- OU2 - Firing Range
- Excavation Limits
- Surface Pickup Area
- Parcels

N

0 500 1,000 1,500
Feet
1 inch = 660 feet

Geographic Data Standards:
Projected Coordinate System:
NAD 1983 State Plane Oregon
South FIPS

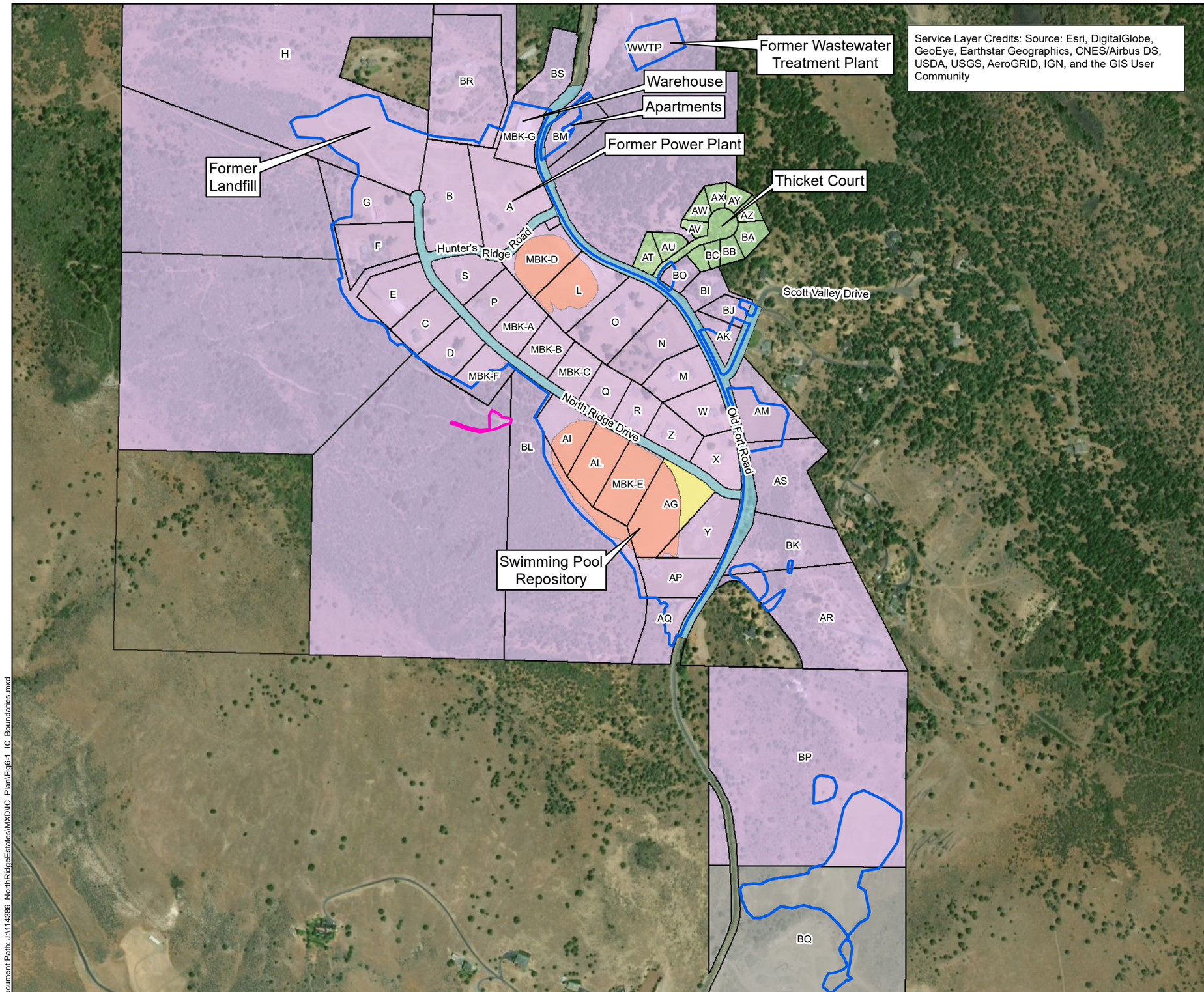
March 2020

This product is for informational purposes and may not have been prepared for legal, engineering or surveying purposes. Users of this information should review or consult the primary data and information source to ascertain the usability of this information.

Site Location Map

Figure 2-1

CDM Smith



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Excavation Limits
- Surface Pickup Area

Institutional Controls Required

- Private Properties
- Onsite Repositories
- Thicket Court Asbestos Pipe
- Right-of-Way
- Common Area

No Institutional Controls Required

- Unlimited Use/Unrestricted Exposure

N

0 500 1,000 1,500
Feet
1 inch = 660 feet

Geographic Data Standards:
Projected Coordinate System:
NAD 1983 State Plane Oregon
South FIPS

March 2020

This product is for informational purposes and may not have been prepared for legal, engineering or surveying purposes. Users of this information should review or consult the primary data and information source to ascertain the usability of this information.

Institutional Control Implementation Areas

Figure 6-1

CDM Smith

Document Path: J:\114386_NorthRidgeEstates\MXD\IC_Plan\Fig6-1_IC_Boundaries.mxd

Tables

Table 6-1. Identification and Selection of Institutional Control Instruments

Institutional Control Instrument – Objective and Description	Remedial Action Objective (RAO)[1]	Instrument Implementation Boundaries	Potentially Responsible Entity	Institutional Control Instrument Screening				Selection and Rationale
				Effectiveness		Implementability		
Proprietary Controls								
Easement and Equitable Servitude. The purpose of the easement and equitable servitude (EES) is to allow access to perform required maintenance on engineered controls and restrict property use. Equitable servitudes may include restrictions on land use, such as prohibitions of residential or agricultural use. Equitable servitudes may also prohibit grantors from conducting activities, such as excavation, that would impair the protectiveness of a constructed remedy, such as a soil cap. An executed EES would be filed with the county records and is intended to run with the land, so that any future owners will also take the property subject to the conditions of the instrument. Through such instruments, grantees, including the Oregon Department of Environmental Quality (ODEQ), may hold perpetual rights to enforce the conditions and restrictions of such instruments.	All RAOs	Private Property On-Site Repositories	ODEQ	❸	Prohibits various land uses to protect human receptors from disturbing the cap. Provides a government enforcement tool.	❸	Highly implementable since this mechanism has already been established at several parcels with older versions of an EES. Would requires property owners to provide notarized signature; however, there appears to be community acceptance of these restrictions.	**Retained:** EESs have already been implemented by ODEQ at the Site and have shown to be effective. Maintaining use of EES to apply land restrictions will be consistent with current practice.
Covenants, Conditions, and Restrictions. The purpose of the covenants, conditions, and restrictions (CC&Rs) is to establish controls to prevent unrestricted land use. Land use restrictions may also be implemented within the site through use of private CC&Rs that are recorded with the property deed. CC&Rs are commonly established for new residential subdivisions and have already been established for residential parcels within the site, setting such requirements as minimum lot size. At the request of the U.S. Environmental Protection Agency (EPA), under authority of the Consent Decree, the North Ridge Estates (NRE) receiver could propose to amend the CC&Rs for the NRE subdivision to incorporate selected land use restrictions necessary to protect human health from exposure to remaining asbestos-containing materials. Amendments to the CC&Rs may be facilitated through the NRE receiver's majority ownership of parcels within the subdivision. Once in place, CC&Rs are typically enforced by homeowners acting through a homeowners' association (HOA). Activities of HOAs are typically funded through assessment of maintenance fees upon homeowners, subject to the CC&Rs. This self-enforcing mechanism may provide enhanced reliability.	All RAOs	Private Property On-Site Repositories	Receiver Potential HOA	❷	Relies on community for enforcement (HOA) to protect human receptors. Volunteer program may not be as effective as enforcement through ODEQ.	❷	Requires amendment of existing CC&Rs and community acceptance. May be more difficult than EESs.	**Not Retained:** The objectives and restrictions that are achieved with the CC&Rs are redundant with those achievable through EESs for this site. Using EESs in lieu of CC&Rs has greater community acceptance and lower associated costs since EESs are standard practice with ODEQ.
Government Controls								
Public Open Space Ordinance. The purpose of a public open space ordinance is to prohibit activities that could result in public exposure to asbestos-containing material (ACM) by preventing damage to engineered controls. This ordinance would place restrictions on various activities in public areas (e.g., low impact activities only to prevent damage to the cap, no all-terrain vehicle use on public trails).	RAOs #1 and #2	On-Site Repositories Common Area	Klamath County	❷	Variance may not prevent various activities since it's a public space. Enforcement would be reliant on county and funding may not always be available to support this type of enforcement.	❶	Reasonable belief that the county would approve the zoning change. Dependent on current county commissioners. Zoning changes can be very time consuming and difficult to implement.	**Not Retained:** Ordinances were found not to be feasible to implement due to time and resource requirements.
Zoning Ordinance. The purpose of a zoning ordinance is to impose land or resource restrictions under the authority of an existing unit of government. Klamath County has demonstrated legal authority to pass ordinances respecting the use and development of land. Such authority might also be used to pass ordinances requiring the safe handling or management of soils from the site that are or may be contaminated with ACM.	All RAOs	Sitewide	Klamath County	❷	Variance would enforce restrictions on future development. However, enforcement would be reliant on county and funding may not always be available to support this type of enforcement.	❶	Reasonable belief that the county would approve the zoning change. Dependent on current county commissioners. Zoning changes can be very time consuming and difficult to implement.	**Not Retained:** Ordinances were found not to be feasible to implement due to time and resource requirements.
Excavation Notification and Reporting Form. The purpose of the excavation notification and reporting form is to protect human health by ensuring adequate engineering controls are in place when excavating into residual contamination (i.e., below the cap). In addition, the notification form would identify the process to require that contaminated materials/waste be properly handled, stored, and disposed of at an approved disposal facility. Further, this notification form would provide requirements and options for acquiring clean fill and topsoil, donning personal protective equipment, providing qualified contractors, and requiring proper waste disposal requirements.	All RAOs	Private Property	ODEQ	❸	Protects human receptors by establishing soil disturbance protocols and compliance requirements with engineering control. Provides notifications to ODEQ prior to execution of excavation work activities. ODEQ may verify that work was performed using proper protocols.	❷	Reasonably possible to implement through either a county-sponsored or state program. Implementation requirements to be determined.	**Retained:** The notification and reporting form requirement has been retained to monitor and enforce the restrictions on excavation activities.

Table 6-1. Identification and Selection of Institutional Control Instruments

Institutional Control Instrument – Objective and Description	Remedial Action Objective (RAO)[1]	Instrument Implementation Boundaries	Potentially Responsible Entity	Institutional Control Instrument Screening				Selection and Rationale
				Effectiveness		Implementability		
Informational Devices								
Notice of Environmental Contamination. The purpose of the Notice of Environmental Contamination is to ensure that residual asbestos information associated with a property is shared with a prospective purchaser during a property transaction. Notice of Environmental Contamination informational notices may also be utilized to provide notice of contamination on the property and to discourage uses that could lead to unacceptable exposures to such contamination.	All RAOs	Thicket Court Asbestos Pipe	ODEQ	❷	Protect human receptors knowledge transfer during a property transaction. Knowledge of notice may be forgotten over time.	❸	Easily implemented using legal instruments and labor resources. Does not require homeowner signature.	**Retained:** Notices of Environmental Contamination have already been implemented by ODEQ at the Site and have shown to be effective.
Community Awareness. The purpose of community awareness is to provide resources and education to inform the community (including public utility) of the site engineered controls in place (i.e., protective cap.) to limit exposures and risk to residual ACM. Long-term site control information may be distributed to existing community members through websites, community meetings, and signage on-site, and/or provided to title companies to distribute to new homeowners. A fact sheet, updated periodically, may also include contact information of long-term program staff. Additionally, a parcel completion package will be provided to property owners upon completion of remediation activities.	All RAOs	Sitewide	EPA ODEQ	❷	Protects human receptors by enhancing awareness of potential site hazards and remedies. Does not physically address contamination.	❸	Easily implemented using available technical and community involvement labor resources.	**Retained:** Community awareness and fact sheets will be distributed to inform the community of institutional controls.
Contractor Awareness. The purpose of contractor awareness is to ensure contractors specialized in asbestos abatement are informed of long-term status of the Site (e.g., contaminated soil left in place, excavation notification and reporting form requirements, etc.).	All RAOs	Sitewide	EPA ODEQ	❷	Protects human receptors by enhancing awareness of potential site hazards and remedies. Does not physically address contamination.	❸	Easily implemented using available technical and community involvement labor resources.	**Retained:** Outreach to qualified contractors would be performed to supplement the notification and reporting form.

Notes:

1. The implementation of the remedial measures, including ICs, should meet the RAOs as follows (EPA 2011):
   - Prevent inhalation exposures by humans to asbestos fibers in soil above levels that pose an unacceptable risk for residential use
   - Prevent the migration of asbestos contamination by natural and man-made transport mechanisms from source locations to unimpacted locations and media
   - Prevent the potential for human inhalation and incidental ingestion exposure to soil in the vicinity of the former power plant contaminated with arsenic concentrations above levels that pose an unacceptable risk to human health

Key:

❶ – Low

❷ – Medium

❸ – High

Table 6-2. Institutional Control Instrument Relationship Matrix by Parcel

Parcels	Tax Lot ID or Ownership (if not Private Property)	Property Address	ODEQ ECSI ID#	Instrument Implementation Boundaries	Institutional Control Instruments			
					Easement and Equitable Servitude	Contaminated Soil Disturbance Notification Form	Notice of Environmental Contamination	Community and Contractor Awareness
A	R-3809-015A0-01800	3637 Hunters Ridge Rd	5994	Private Property	•	•		•
AK and BJ	R-3809-015D0-02600	Vacant	6012	Private Property	•	•		•
AM	R-3809-015D0-01000	3451 Old Fort Rd	6011	Private Property	•	•		•
Antenna Road	R-3809-015C0-00500	Vacant/Service Rd	6029	Private Property	•			
AP	R-3809-015D0-01500	2840 Old Fort Rd	5988	Private Property	•	•		•
AQ	R-3809-015D0-01600	2720 Old Fort Rd	5987	Private Property	•	•		•
AR	R-3809-015D0-01800	2725 Old Fort Rd	6013	Private Property	•	•		•
AS	R-3809-015D0-01100	Vacant	6014	Private Property	•	•		•
AT	R-3809-015A0-00400	3707 Thicket Ct	6030	Thicket Court Asbestos Pipe			•	•
AU	R-3809-015A0-00500	3737 Thicket Ct	6030	Thicket Court Asbestos Pipe			•	•
AV	R-3809-015A0-00600	3809 Thicket Ct	6030	Thicket Court Asbestos Pipe			•	•
AW	R-3809-015A0-00700	3815 Thicket Ct	6030	Thicket Court Asbestos Pipe			•	•
AX	R-3809-015A0-00800	3821 Thicket Ct	6030	Thicket Court Asbestos Pipe			•	•
AY	R-3809-015A0-00900	3827 Thicket Ct	6030	Thicket Court Asbestos Pipe			•	•
AZ	R-3809-015A0-01000	---	6030	Thicket Court Asbestos Pipe			•	•
B	R-3809-015B0-00600	3433 Hunters Ridge Rd	5993	Private Property	•	•		•
BA	R-3809-015A0-01100	3818 Thicket Ct	6030	Thicket Court Asbestos Pipe			•	•
BB	R-3809-015A0-01200	3812 Thicket Ct	6030	Thicket Court Asbestos Pipe			•	•
BC	R-3809-015A0-01301	---	6030	Thicket Court Asbestos Pipe			•	•
BC	R-3809-015A0-01300	3804 Thicket Ct	6030	Thicket Court Asbestos Pipe			•	•
BI	R-3809-015D0-02700	3831 Scott Valley Dr	6016	Private Property			•	•
BK	R-3809-015D0-01900	2727 Old Fort Rd	6020	Private Property	•	•		•
BL, MBK-F, and Part of AI	R-3809-015D0-01502 R-3809-015C0-00500	Vacant	6015	Private Property	•	•		•
BM	R-3809-015A0-00307	4343 Old Fort Rd	6019	Private Property	•	•		•
BO	R-3809-015A0-01600	3710 Thicket Ct	6021	Private Property	•	•		•
BP	R-3809-02200-00100	2737 Old Fort Rd	6022	Private Property	•	•		•
BQ	R-3809-02200-00801	Vacant/Quarry	6023	Private Property				
BR	R-3809-015B0-00101	3510 Jasma Lane	6018	Private Property	•	•		•
Part of BR	R-3809-015A0-00303	3620 Jasma Lane	6018	Private Property	•	•		•
C	R-3809-015C0-00300	3508 North Ridge Dr	5992	Private Property	•	•		•
Part of C, E, and F	R-3809-015C0-00300 R-3809-015C0-00700	Vacant	6029	Private Property	•	•		•
D	R-3809-015C0-00400	3514 North Ridge Dr	5991	Private Property	•	•		•
E	R-3809-015C0-00200	3502 North Ridge Dr	5995	Private Property	•	•		•
F	R-3809-015B0-00500	3440 North Ridge Dr	5996	Private Property	•	•		•
G	R-3809-015B0-00400	3434 North Ridge Dr	5997	Private Property	•	•		•
H - Parcel 1	R-3809-015B0-00202	Vacant	5998	Private Property	•	•		•
H - Parcel 2	R-3809-015B0-00201	Vacant	5998	Private Property	•	•		•
Hunters Ridge Road	Klamath County	---	6376	Right-of-Way		•		•
M	R-3809-015D0-00800	3560 Old Fort Rd	5999	Private Property	•	•		•
MBK-A	R-3809-015D0-03000	Vacant	6026	Private Property	•	•		•
MBK-B	R-3809-015D0-03100	Vacant	6027	Private Property	•	•		•
MBK-C	R-3809-015D0-03200	Vacant	6028	Private Property	•	•		•
MBK-G	R-3809-015A0-00304	4300 Old Fort Rd	6025	Private Property	•	•		•
Memorial Park Repository - MBK-D and L	R-3809-015A0-01700 R-3809-015D0-00500	Vacant	5990	On-Site Repository	•			•
N	R-3809-015D0-00700	3668 Old Fort Rd	6000	Private Property	•	•		•
North Ridge Drive	Klamath County	---	6376	Right-of-Way		•		•
O	R-3809-015D0-00600	3808 Old Fort Rd	6001	Private Property	•	•		•
Old Fort Road	Klamath County	---	6376	Right-of-Way		•		•
P	R-3809-015D0-02900	3515 North Ridge Dr	6002	Private Property	•	•		•
Q	R-3809-015D0-03300	3533 North Ridge Dr	6003	Private Property	•	•		•
R	R-3809-015D0-03400	3537 North Ridge Dr	6004	Private Property	•	•		•
S	R-3809-015C0-00100	3530 Hunters Ridge Rd	6005	Private Property	•	•		•
Scott Valley Drive	Klamath County	---	6376	Right-of-Way		•		•
Swimming Pool Repository - AG, AL, MBK-E, Part of AI Common Area (Relocated Memorial Park)	R-3809-015D0-01501	Vacant	5989	On-Site Repository Common Area	•			•
Thicket Court	Private Road	---	6030	Right-of-Way				•
W	R-3809-015D0-00900	3442 Old Fort Rd	6006	Private Property	•	•		•
WWTP	R-3809-015A0-00301	Old Fort Rd	6024	Private Property	•	•		•
X	R-3809-015D0-01200	3601 North Ridge Dr	6007	Private Property	•	•		•
Y	R-3809-015D0-01400	3636 North Ridge Dr	6008	Private Property	•	•		•
Z	R-3809-015D0-03500	3547 North Ridge Dr	6009	Private Property	•	•		•

Key:

	Proprietary Controls
	Government Controls
	Informational Devices

Appendix A

Appendix A

Operation and Maintenance Inspection Form

Appendix A – Operation and Maintenance Inspection Form

Part I. General Site Information					
Site Name:	North Ridge Estates	**State/County:**	Oregon (Klamath County)	**Parcel/Tax ID:**	
EPA Point of Contact	Linda Meyer (206) 553-6636	**ODEQ Point of Contact**	Katie Daugherty (541) 229-6748		
Inspection Date:		**Person(s) Performing Inspection:**		**Person(s) Performing Inspection:**	

Part II. Remedy Performance Assessment

Remedy Component	Potential Problem	Problem Observed?			If Yes, Describe Extent of Problem	Repair Required?		If Yes, Describe Potential Repair Solution	Responsibility	Due Date
		Yes	No	N/A		Yes	No			
Protective Cap	Have rills developed deeper than 2 inches? Are the rills within a 10-foot interval?	☐	☐	☐		☐	☐			
	Have gullies developed deeper than 6 inches?	☐	☐	☐		☐	☐			
	Have animals created burrows in the protective cap?	☐	☐	☐		☐	☐			
	Have unauthorized vehicles damaged the protective cap?	☐	☐	☐		☐	☐			
	Any evidence of ACM on Site including areas where the protective cap is less than 2 feet (see as-built drawings) or within the dripline of the legacy trees?	☐	☐	☐		☐	☐			
	Are there areas that show evidence of unstable slopes, subsidence, or slope failure? Are there signs of active bank erosion and/or lateral cutting?	☐	☐	☐		☐	☐			
	Any visible ACM along the perimeter of the Site (where applicable)?	☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			

Remedy Component	Potential Problem	Problem Observed?			If Yes, Describe Extent of Problem	Repair Required?		If Yes, Describe Potential Repair Solution	Responsibility	Due Date
		Yes	No	N/A		Yes	No			
Vegetation	Are grass species well maintained and in good health? (sparse vegetation no greater than 10 percent of area and bare areas no greater than 100 square feet)	☐	☐	☐		☐	☐			
	Are trees and shrubs well maintained and in good health?	☐	☐	☐		☐	☐			
	Are there any stressed or dying trees that may impact or damage the protective when felled?	☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			
Ditches and Culverts	Are ditches and culverts free of obstructions that may impede conveyance of stormwater?	☐	☐	☐		☐	☐			
	Are riprap surface intact and effectively providing armor protection?	☐	☐	☐		☐	☐			
	Are there any areas that show signs of excessive scour? (i.e., gullies forming along centerline of ditch)	☐	☐	☐		☐	☐			
	Are culvert inlets and outlets damaged?	☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			

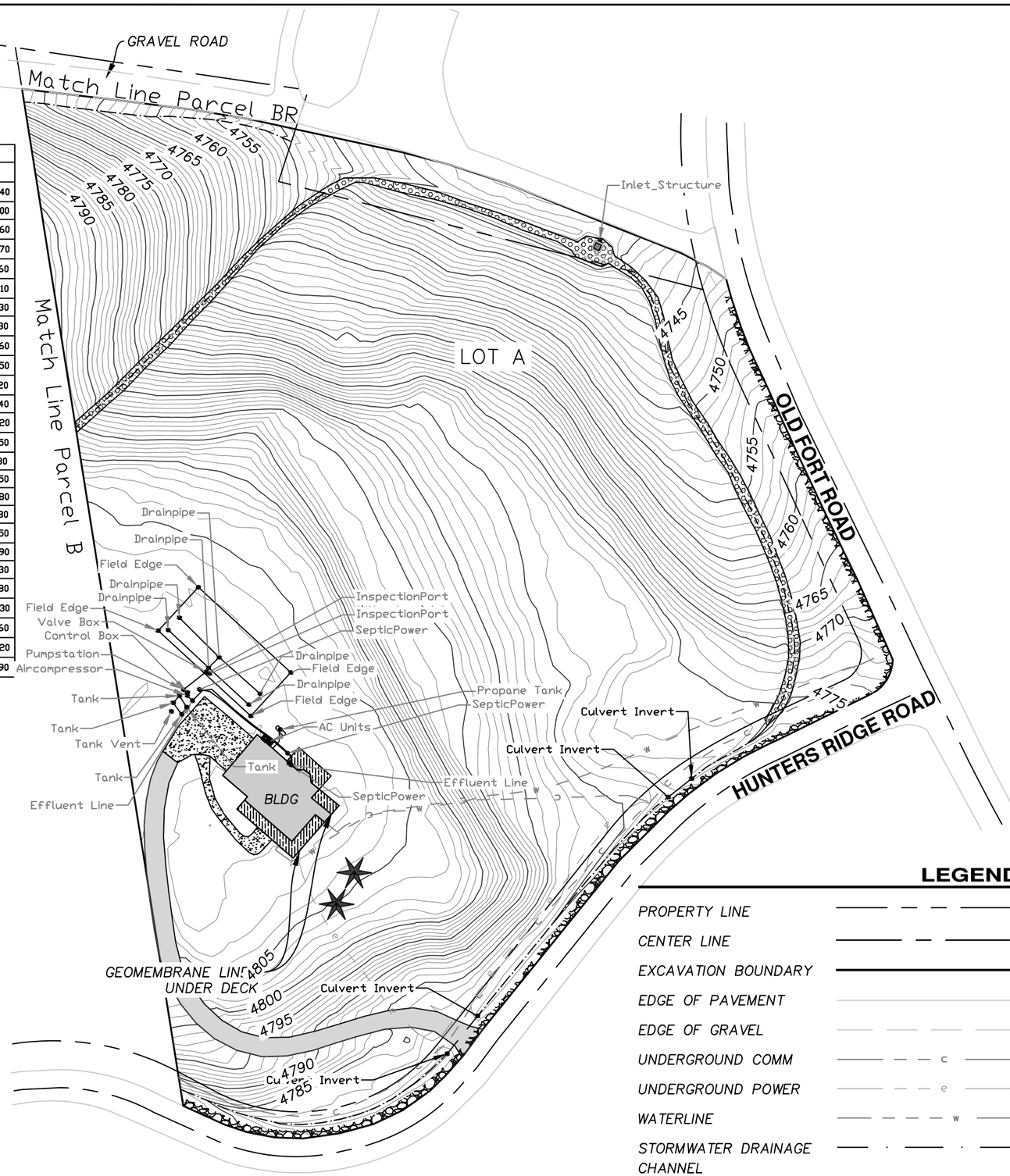
Remedy Component	Potential Problem	Problem Observed?			If Yes, Describe Extent of Problem	Repair Required?		If Yes, Describe Potential Repair Solution	Responsibility	Due Date
		Yes	No	N/A		Yes	No			
Driveways, and Walkways	Are the driveways showing signs are failure? (i.e., alligator cracking)	☐	☐	☐		☐	☐			
	Are there any other signs of considerable damage to paved surfaces, other than normal wear and use?	☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			
Crawlspaces and Covered Decks	Are the liners inside crawlspaces and under covered decks intact? Are there any punctures in the liner?	☐	☐	☐		☐	☐			
	Are the liners exposed to UV radiation?	☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			
Access Controls	Where applicable, are access controls in place? Any damages?	☐	☐	☐		☐	☐			
	Are the access controls effective?	☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			
Miscellaneous Features/Changes in Site Conditions	Are there any new site features installed that have damaged the protective cap?	☐	☐	☐		☐	☐			
		☐	☐	☐		☐	☐			

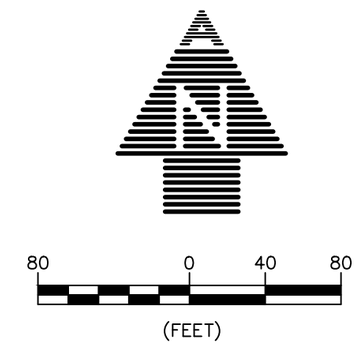
Appendix B

Appendix B

Remedial Action As-Built Drawings

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
3374	Drainpipe	4807.31	220907.5870	4583433.7740
3358	Effluent Line	4807.37	220841.7470	4583489.7800
3363	SepticPower	4805.88	220892.8000	4583427.6460
3376	Drainpipe	4807.81	220890.0710	4583468.5270
3368	SepticPower	4806.59	220849.7560	4583487.1360
3370	SepticPower	4807.24	220842.8720	4583488.2510
3372	Effluent Line	4805.55	220885.2900	4583422.9130
3373	Drainpipe	4807.93	220933.0940	4583406.5130
3375	Drainpipe	4807.84	220882.7040	4583460.9560
3377	Drainpipe	4807.29	220914.6010	4583440.8950
3378	Drainpipe	4807.90	220941.3840	4583414.0720
3379	Valve Box	4807.81	220904.7900	4583432.1640
3380	InspectionPort	4807.82	220903.6810	4583434.6620
3381	InspectionPort	4807.36	220904.2580	4583433.5150
3382	Tank	4807.52	220880.9590	4583419.0130
3383	Tank	4807.52	220876.0860	4583415.5450
3384	Tank	4806.99	220883.8500	4583409.9580
3385	Tank	4807.02	220888.6450	4583414.0380
3386	Pumpstation	4806.96	220892.7560	4583416.8450
3387	Tank Vent	4808.88	220878.0210	4583408.6690
3388	Control Box	4806.49	220890.8480	4583419.4830
3389	Aircompressor	4807.93	220888.6610	4583419.3880
3390	Field Edge	4807.23	220874.9490	4583462.2930
3391	Field Edge	4805.06	220904.3490	4583489.4160
3392	Field Edge	4806.37	220961.9850	4583426.9420
3393	Field Edge	4807.39	220932.5860	4583399.8190





REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	TREE
CENTER LINE	DECK
EXCAVATION BOUNDARY	ASPHALT
EDGE OF PAVEMENT	CONCRETE
EDGE OF GRAVEL	OVERSIZED MATERIAL
UNDERGROUND COMM	GRAVEL SHOULDER
UNDERGROUND POWER	
WATERLINE	
STORMWATER DRAINAGE CHANNEL	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT A
FINAL LIFT
TOPOGRAPHIC SURVEY

ADKINS CONSULTING ENGINEERING, LLP
Engineers ▲ Planners ▲ Surveyors
1435 Esplanade Ave • Klamath Falls, Oregon 97601 • (541) 884-4666 • FAX (541) 884-5335
Oregon • California

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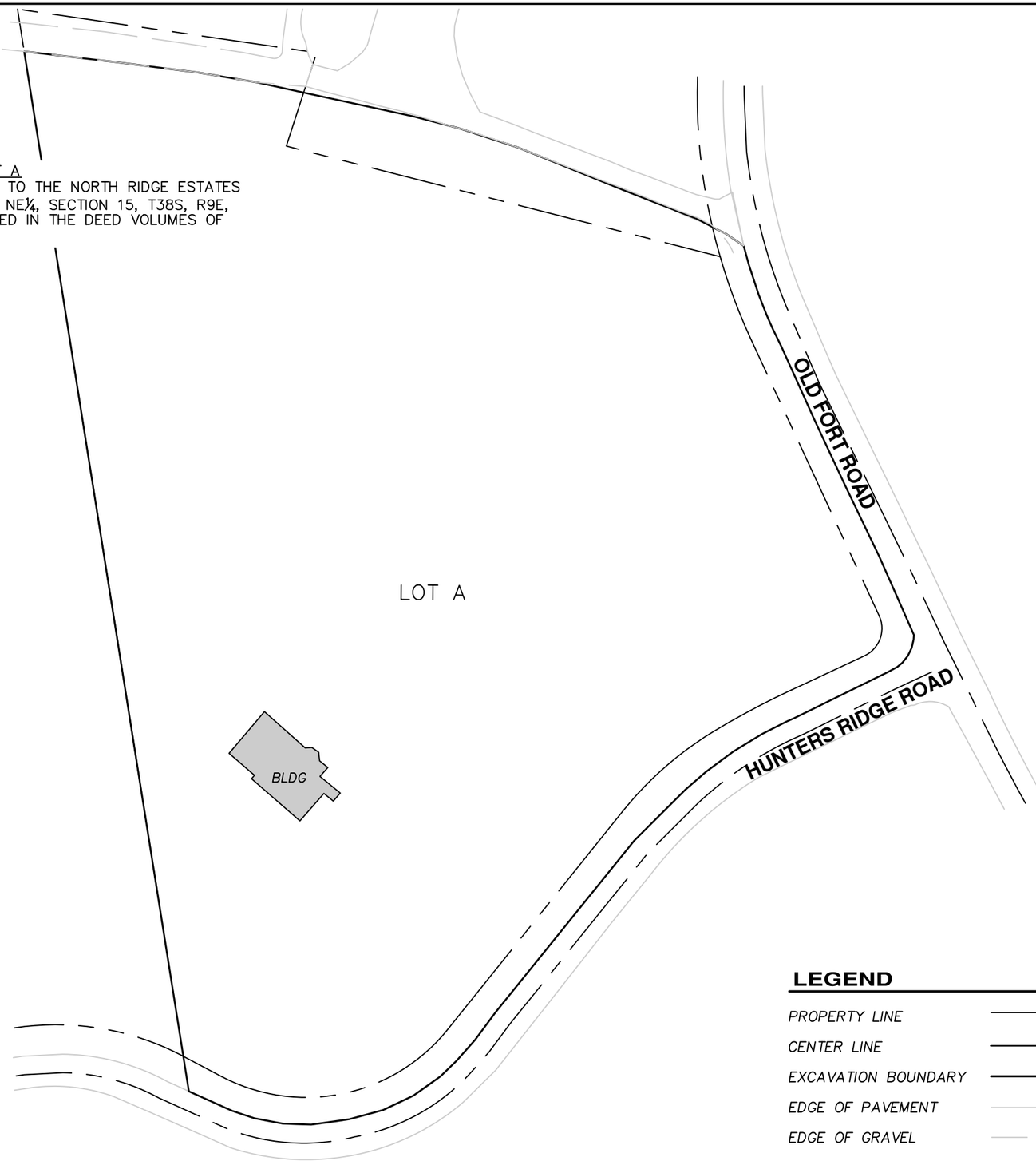
DATE:	2/21/2019
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	SES
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

A.3

EXCAVATION DESCRIPTION FOR LOT A

LOT 10, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE SW¼ NE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



80 0 40 80

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	
EDGE OF GRAVEL	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT A

LEGAL DESCRIPTION

TOPOGRAPHIC SURVEY

ADKINS CONSULTING ENGINEERING, LLP

Engineers ▲ Planners ▲ Surveyors

1435 Esplanade Ave • Klamath Falls, Oregon 97601 • (541) 884-4666 • FAX (541) 884-5335

Oregon • California

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DRAWN BY:	SES
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

A.4

LEGEND

PROPERTY LINE

CENTER LINE

EXCAVATION BOUNDARY

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/19

50 0 25 50

(FEET)

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT AK
FINAL SURFACE AS-BUILT
TOPOGRAPHIC SURFACE

ADKINS CONSULTING ENGINEERING, LLP
Engineers ▲ Planners ▲ Surveyors
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Oregon · California

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FILE:	PLAN
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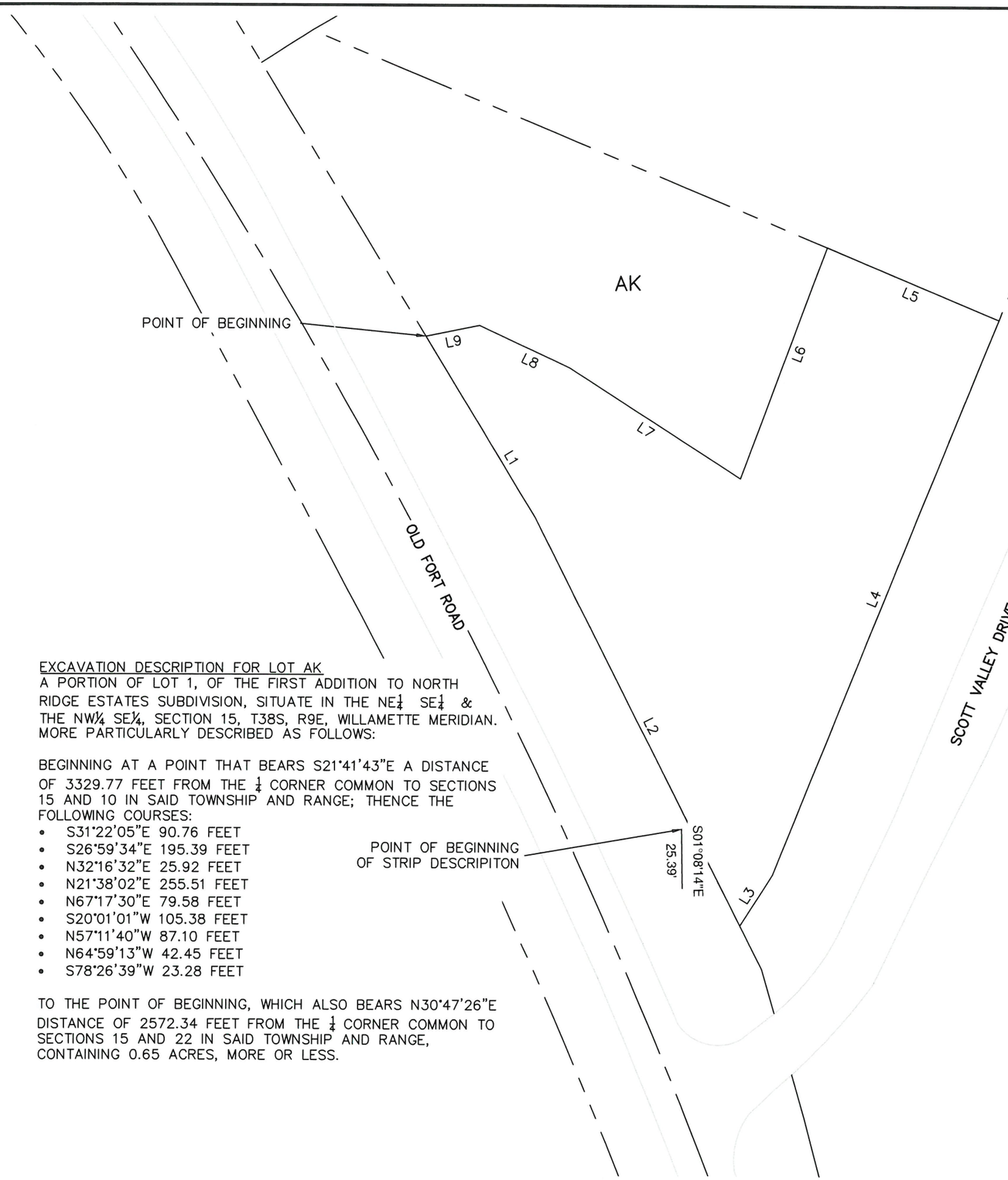
DRAWN BY:	SAR
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	1" = 50'

AK.3



STRIP DESCRIPTION FOR LOT AK

A 1 FOOT STRIP OF LAND, 25.39 FEET IN LENGTH, IN LOT 1 OF THE FIRST ADDITION TO NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NE¼ SE¼ & THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. THE CENTERLINE OF WHICH IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S21°06'03"E A DISTANCE OF 3566.21 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE S01°08'14"E 25.39 FEET, TO THE END OF SAID CENTERLINE, WHICH ALSO BEARS N35°55'02"E A DISTANCE OF 2436.16 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 25.39 SQAURE FEET, MORE OR LESS.

LEGEND

PROPERTY LINE

CENTER LINE

EXCAVATION BOUNDARY

EXCAVATION DESCRIPTION FOR LOT AK

A PORTION OF LOT 1, OF THE FIRST ADDITION TO NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NE¼ SE¼ & THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S21°41'43"E A DISTANCE OF 3329.77 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S31°22'05"E 90.76 FEET
- S26°59'34"E 195.39 FEET
- N32°16'32"E 25.92 FEET
- N21°38'02"E 255.51 FEET
- N67°17'30"E 79.58 FEET
- S20°01'01"W 105.38 FEET
- N57°11'40"W 87.10 FEET
- N64°59'13"W 42.45 FEET
- S78°26'39"W 23.28 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N30°47'26"E DISTANCE OF 2572.34 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.65 ACRES, MORE OR LESS.

Line Table

Line #	Length	Direction
L1	90.757	S31° 22' 04.55"E
L2	195.391	S26° 59' 34.01"E
L3	25.917	N32° 16' 32.33"E
L4	255.505	N21° 38' 01.59"E
L5	79.579	N67° 17' 30.28"W
L6	105.383	S20° 01' 00.51"W
L7	87.097	N57° 11' 40.19"W
L8	42.453	N64° 59' 12.98"W
L9	23.276	S78° 26' 38.78"W

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/19

50 0 25 50
(FEET)

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT AK
AS-BUILT
EXCAVATION DESRCIPTION

ADKINS CONSULTING ENGINEERING, LLP
Engineers ▲ Planners ▲ Surveyors
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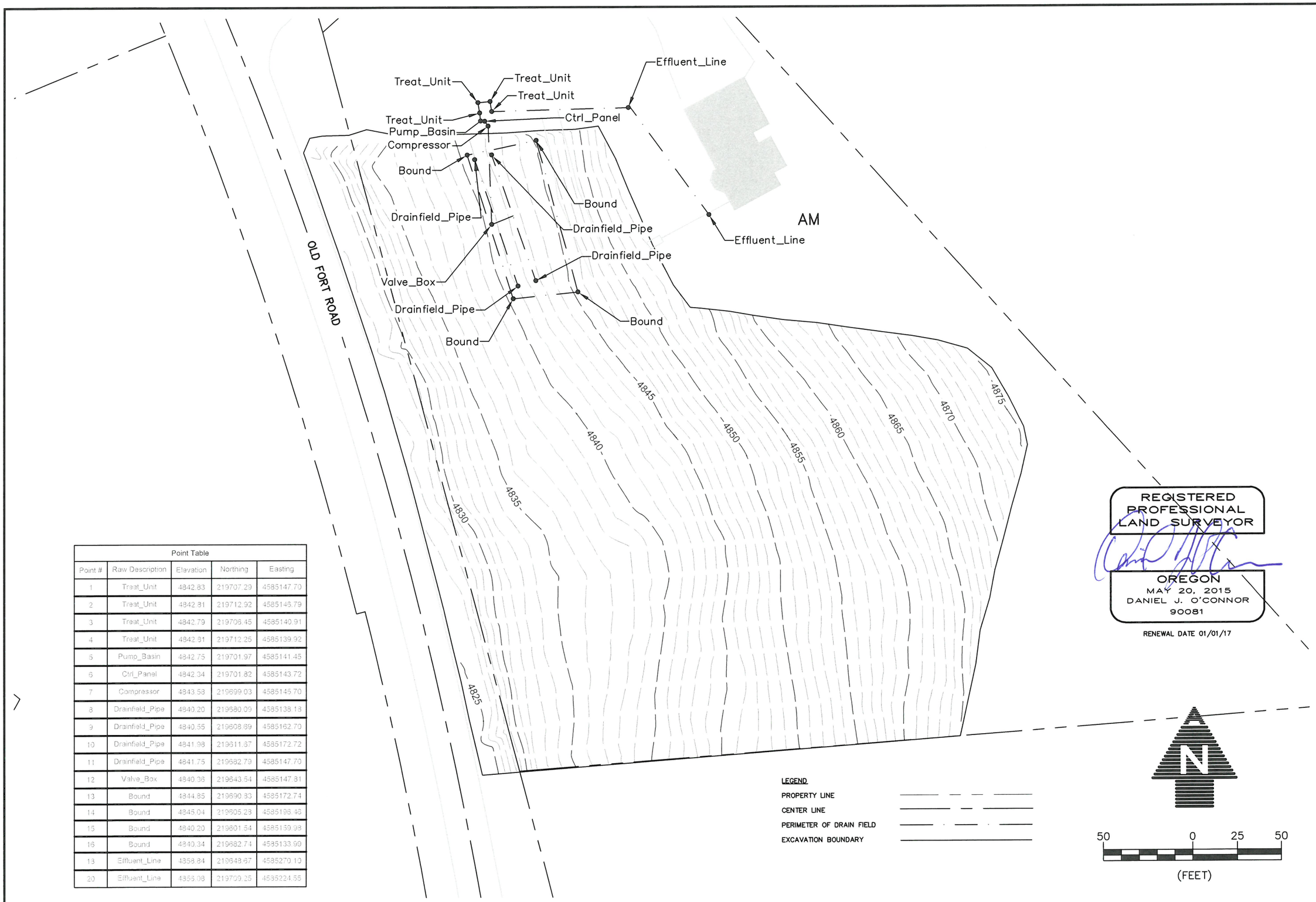
SURVEYED BY:	DNN
SCALE:	1" = 50'

AK.4



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
1	Treat_Unit	4842.83	219707.29	4585147.70
2	Treat_Unit	4842.81	219712.92	4585146.79
3	Treat_Unit	4842.79	219706.45	4585140.91
4	Treat_Unit	4842.81	219712.25	4585139.92
5	Pump_Basin	4842.75	219701.97	4585141.45
6	Ctrl_Panel	4842.34	219701.82	4585143.72
7	Compressor	4843.58	219699.03	4585145.70
8	Drainfield_Pipe	4840.20	219680.09	4585138.13
9	Drainfield_Pipe	4840.55	219608.69	4585162.70
10	Drainfield_Pipe	4841.98	219611.87	4585172.72
11	Drainfield_Pipe	4841.75	219682.79	4585147.70
12	Valve_Box	4840.36	219643.54	4585147.81
13	Bound	4844.85	219690.33	4585172.74
14	Bound	4845.04	219605.23	4585196.46
15	Bound	4840.20	219601.54	4585159.98
16	Bound	4840.34	219682.74	4585133.99
13	Effluent_Line	4858.84	219648.67	4585270.10
20	Effluent_Line	4856.08	219709.25	4585224.55

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT AM
FINAL SURFACE AS-BUILT
TOPOGRAPHIC SURVEY

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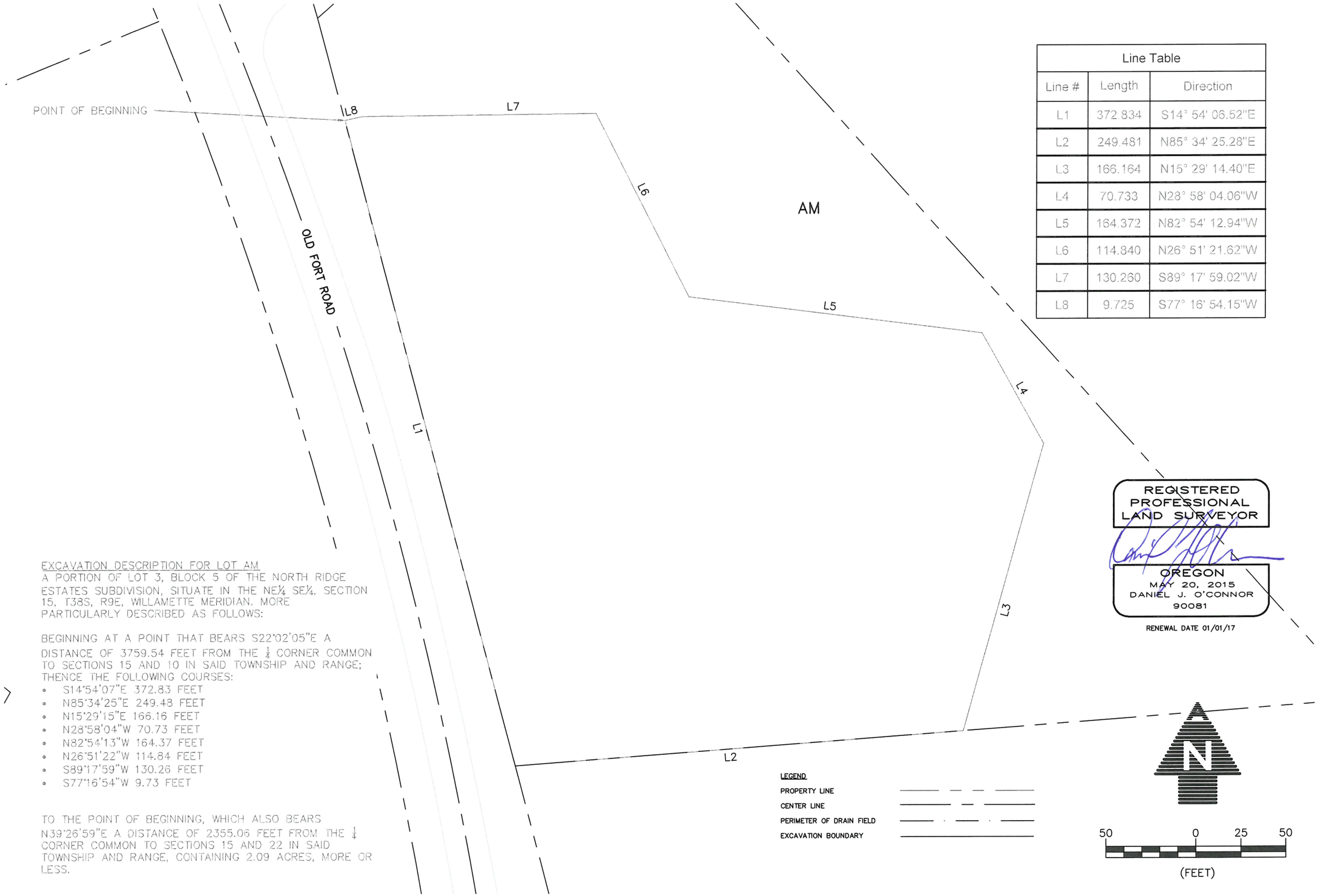
SURVEYED BY:	DNN
SCALE:	1" = 50'

AM.3



Line Table		
Line #	Length	Direction
L1	372.834	S14° 54' 06.52"E
L2	249.481	N85° 34' 25.28"E
L3	166.164	N15° 29' 14.40"E
L4	70.733	N28° 58' 04.06"W
L5	164.372	N82° 54' 12.94"W
L6	114.840	N26° 51' 21.62"W
L7	130.260	S89° 17' 59.02"W
L8	9.725	S77° 16' 54.15"W

EXCAVATION DESCRIPTION FOR LOT AM

A PORTION OF LOT 3, BLOCK 5 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NE¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S22°02'05"E A DISTANCE OF 3759.54 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S14°54'07"E 372.83 FEET
- N85°34'25"E 249.48 FEET
- N15°29'15"E 166.16 FEET
- N28°58'04"W 70.73 FEET
- N82°54'13"W 164.37 FEET
- N26°51'22"W 114.84 FEET
- S89°17'59"W 130.26 FEET
- S77°16'54"W 9.73 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N39°26'59"E A DISTANCE OF 2355.06 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 2.09 ACRES, MORE OR LESS.

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/17

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT AM
AS-BUILT
EXCAVATION DESCRIPTION

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SURVEYED BY:	DNN
SCALE:	1" = 50'

AM.4

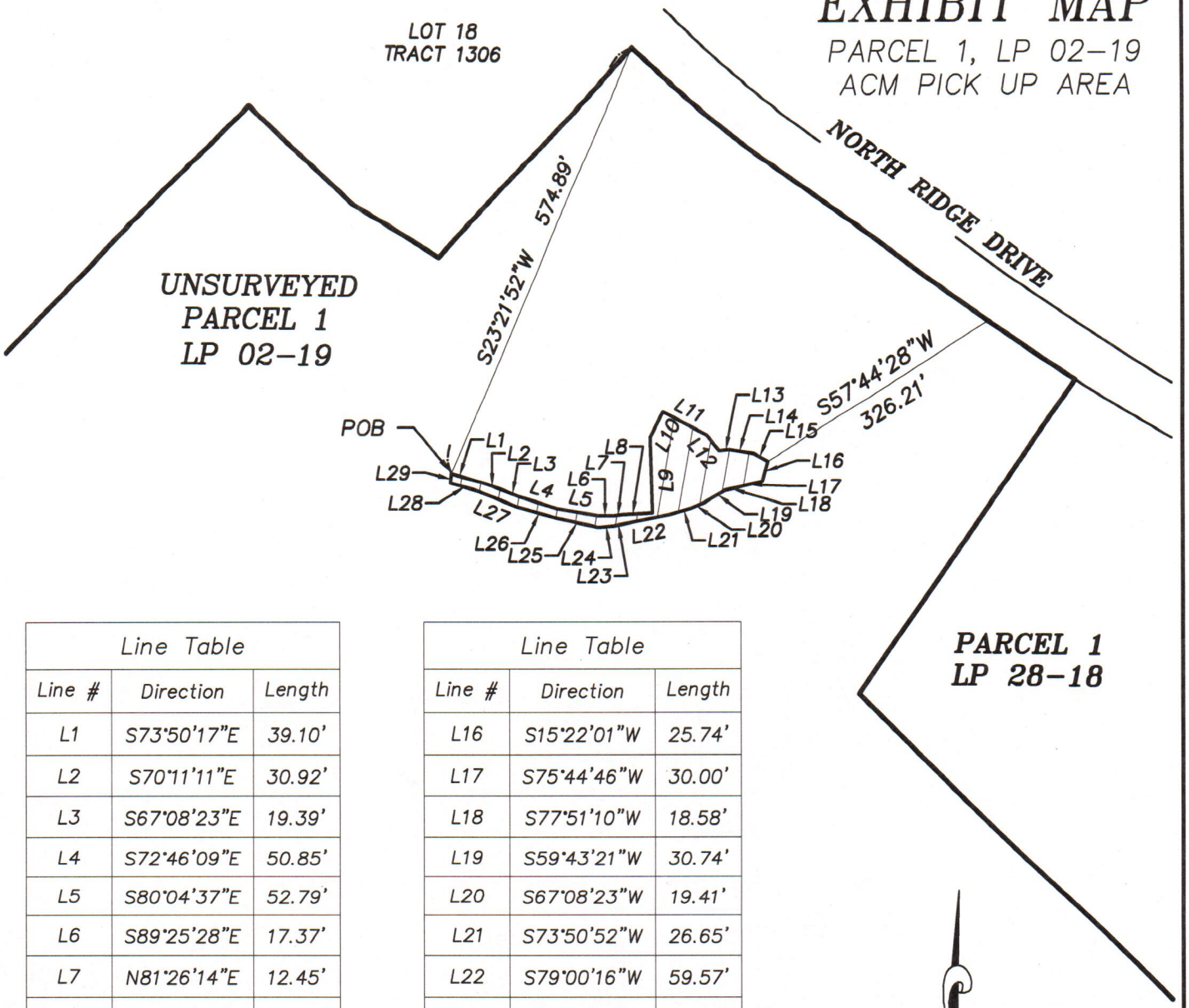
ACM Pick Up Area

Commencing at the most Northwesterly corner of said Parcel 1, located on the Southerly right of way line of North Ridge Drive; thence South 23°21'52" West, 574.89 feet to the True Point of Beginning; thence South 73°50'17" East, 39.10 feet; thence South 70°11'11" East, 30.92 feet; thence South 67°08'23" East, 19.39 feet; thence South 72°46'09" East, 50.85 feet; thence South 80°04'37" East, 52.79 feet; thence South 89°25'28" East, 17.37 feet; thence North 81°26'14" East, 12.45 feet; thence North 86°47'22" East, 37.44 feet; thence North 01°31'12" West, 93.90 feet; thence North 26°19'39" East, 36.10 feet; thence South 61°34'20" East, 61.89 feet; thence South 39°56'15" East, 25.23 feet; thence North 82°52'46" East, 11.99 feet; thence South 81°21'23" East, 31.40 feet; thence South 60°08'11" East, 20.58 feet to a point that Bears South 57°44'28" West, 326.21 feet from the most Northeasterly corner of said Parcel 1; thence South 15°22'01" West, 25.74 feet; thence South 75°44'46" West, 30.00 feet; thence South 77°51'10" West, 18.58 feet; thence South 59°43'21" West, 30.74 feet; thence South 67°08'23" West, 19.41 feet; thence South 73°50'52" West, 26.65 feet; thence South 79°00'16" West, 59.57 feet; thence South 77°39'00" West, 10.92 feet; thence South 85°06'15" West, 19.61 feet; thence North 77°34'10" West, 55.22 feet; thence North 74°14'55" West, 50.84 feet; thence North 67°37'59" West, 51.39 feet; thence North 73°35'01" West, 36.52 feet; thence North 05°26'39" East, 11.77 feet to the point of beginning.

Bearings and Distances are based on the Oregon State Plane Coordinate System, South Zone.

EXHIBIT MAP

PARCEL 1, LP 02–19
ACM PICK UP AREA



Line Table		
Line #	Direction	Length
L1	S73°50'17"E	39.10'
L2	S70°11'11"E	30.92'
L3	S67°08'23"E	19.39'
L4	S72°46'09"E	50.85'
L5	S80°04'37"E	52.79'
L6	S89°25'28"E	17.37'
L7	N81°26'14"E	12.45'
L8	N86°47'22"E	37.44'
L9	N01°31'12"W	93.90'
L10	N26°19'39"E	36.10'
L11	S61°34'20"E	61.89'
L12	S39°56'15"E	25.23'
L13	N82°52'46"E	11.99'
L14	S81°21'23"E	31.40'
L15	S60°08'11"E	20.58'

Line Table		
Line #	Direction	Length
L16	S15°22'01"W	25.74'
L17	S75°44'46"W	30.00'
L18	S77°51'10"W	18.58'
L19	S59°43'21"W	30.74'
L20	S67°08'23"W	19.41'
L21	S73°50'52"W	26.65'
L22	S79°00'16"W	59.57'
L23	S77°39'00"W	10.92'
L24	S85°06'15"W	19.61'
L25	N77°34'10"W	55.22'
L26	N74°14'55"W	50.84'
L27	N67°37'59"W	51.39'
L28	N73°35'01"W	36.52'
L29	N05°26'39"E	11.77'

1"=200'

REGISTERED
PROFESSIONAL
LAND SURVEYOR

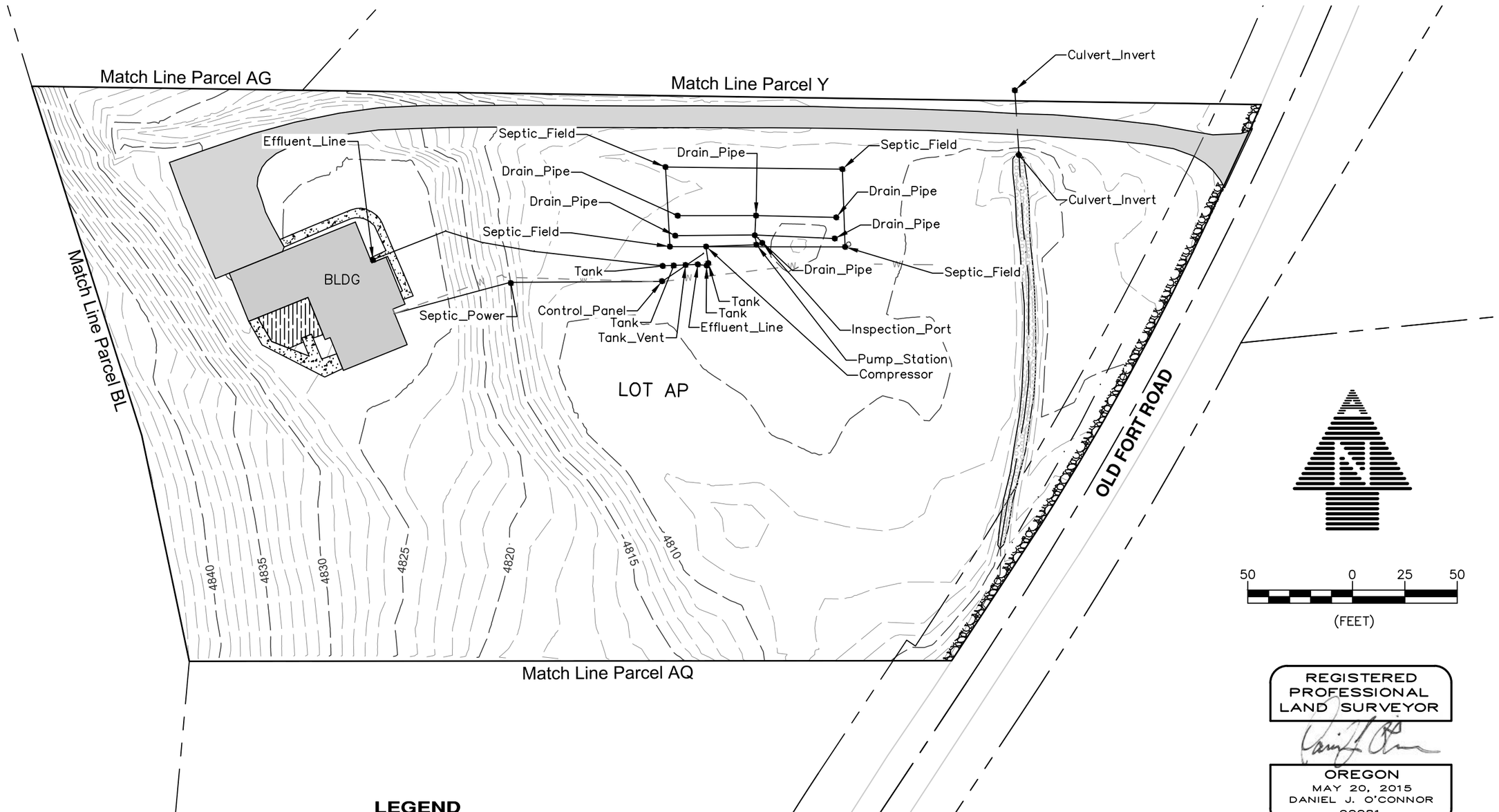
Keith R. Rhine

OREGON
JULY 11, 2000
KEITH R. RHINE
58985
RENEWAL DATE: 12–31–20

R-C RHINE-CROSS GROUP

RHINE-CROSS GROUP LLC
ENGINEERING - SURVEYING - PLANNING
112 N 5th ST - SUITE 200 - P.O. BOX 909
KLAMATH FALLS, OREGON 97601

Phone: (541) 851-9405 Fax: (541) 273-9200 admin@rc-grp.com



LEGEND

PROPERTY LINE	DECK
CENTER LINE	ASPHALT
EXCAVATION BOUNDARY	CONCRETE
EDGE OF PAVEMENT	GRAVEL SHOULDER
WATERLINE	OVERSIZED MATERIAL
STORMWATER DRAINAGE CHANNEL	

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT AP
FINAL SURFACE AS-BUILT
TOPOGRAPHIC SURVEY

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DRAWN BY:	ZEF
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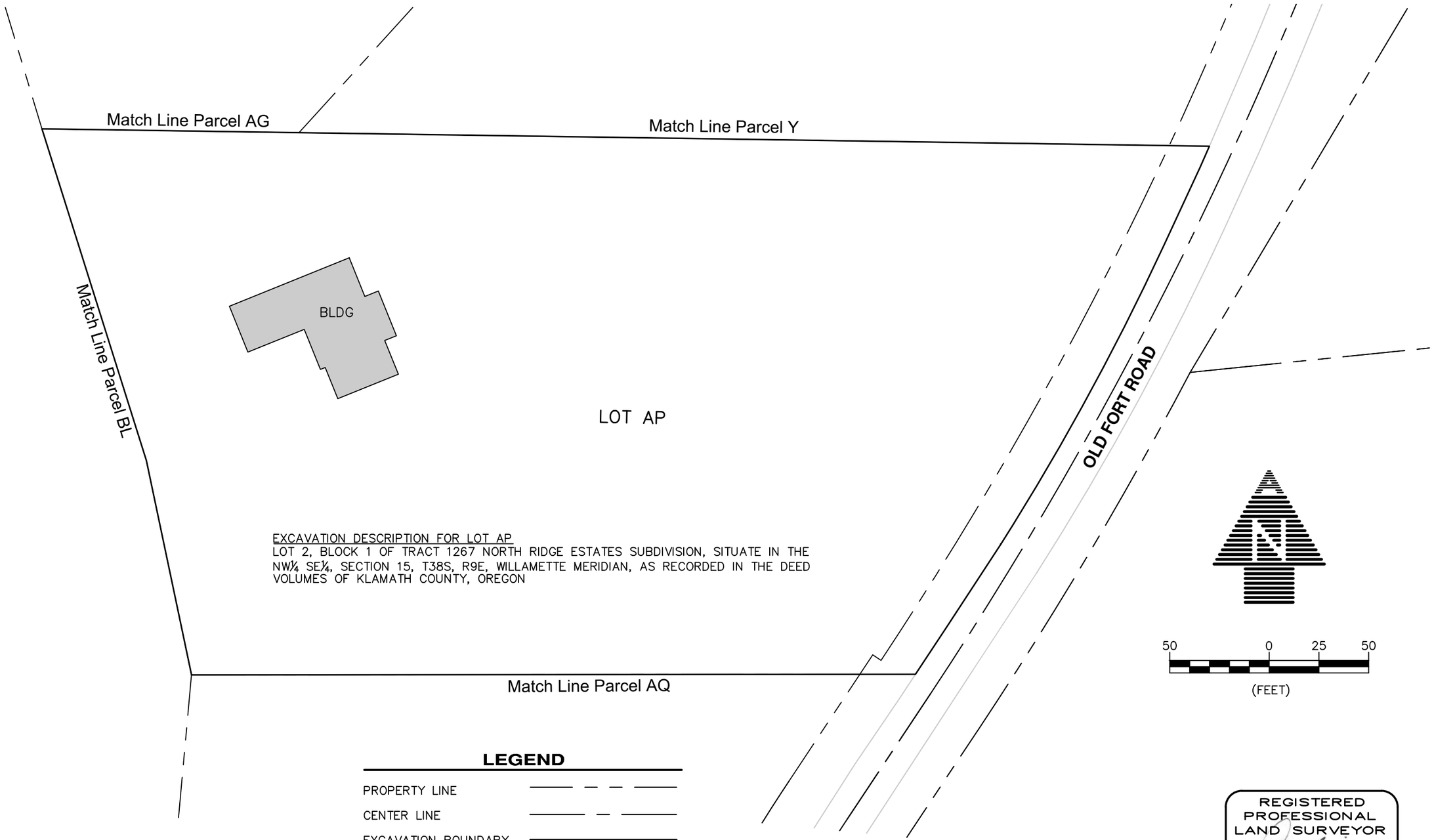
SURVEYED BY:	DNN
SCALE:	1" = 50'

AP.3



EXCAVATION DESCRIPTION FOR LOT AP
LOT 2, BLOCK 1 OF TRACT 1267 NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT AP AS-BUILT EXCAVATION DESCRIPTION

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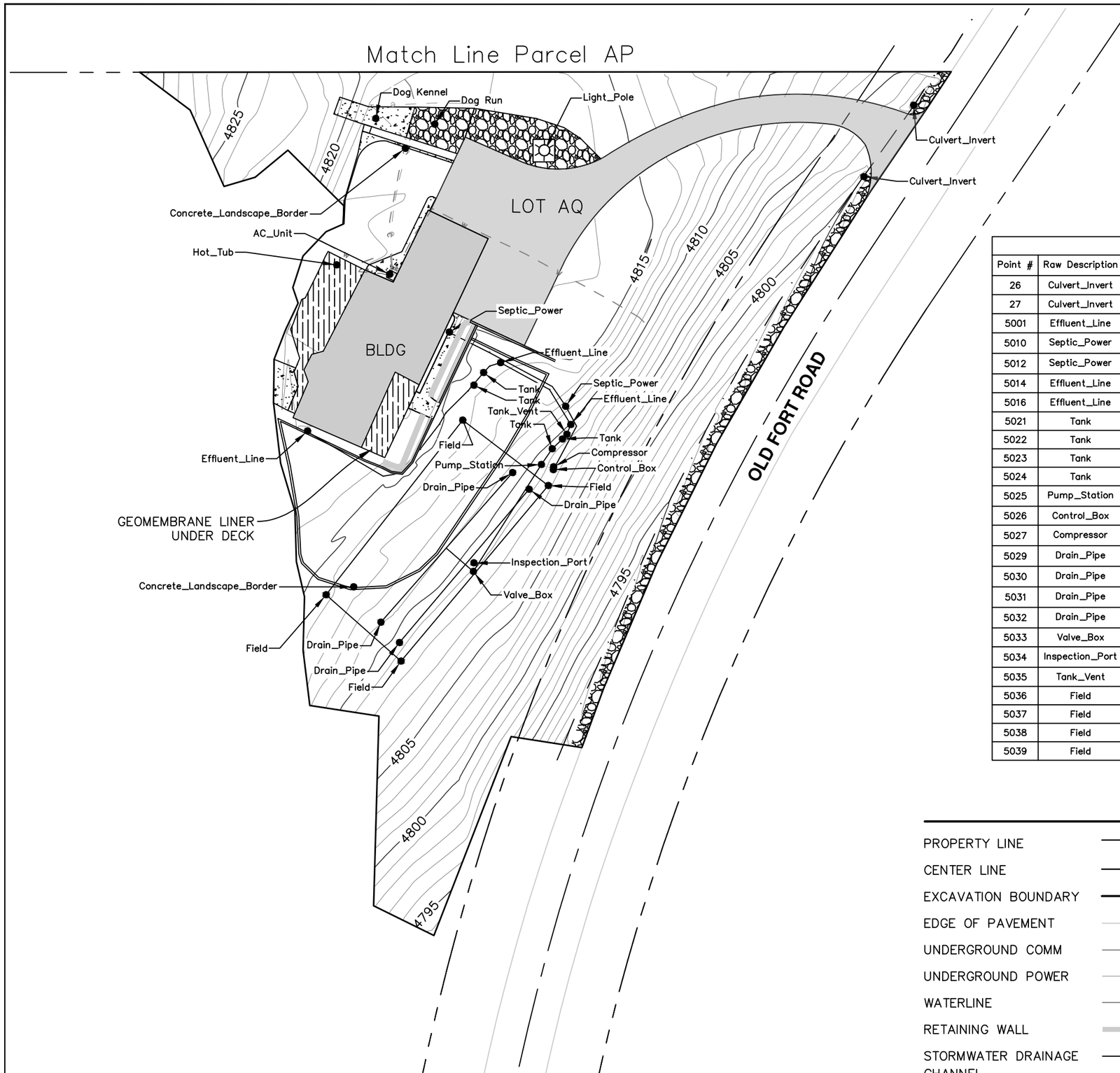
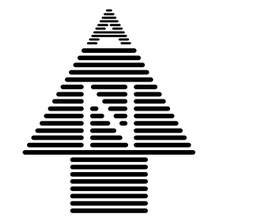
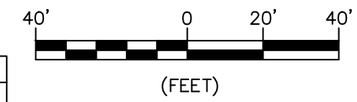
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	1" = 50'

AP.4







Point Table				
Point #	Raw Description	Elevation	Northing	Easting
26	Culvert_Invert	4800.02	218254.9690	4584837.6480
27	Culvert_Invert	4801.06	218281.9020	4584856.3830
5001	Effluent_Line	4815.93	218159.0850	4584627.8000
5010	Septic_Power	4815.53	218196.3370	4584681.2980
5012	Septic_Power	4808.15	218168.3670	4584725.1770
5014	Effluent_Line	4812.01	218184.8150	4584700.6000
5016	Effluent_Line	4807.68	218161.4940	4584727.0600
5021	Tank	4814.31	218176.3170	4584690.5360
5022	Tank	4814.37	218181.0760	4584694.2220
5023	Tank	4809.68	218152.3620	4584720.0750
5024	Tank	4809.74	218156.0040	4584723.9480
5025	Pump_Station	4809.72	218146.4170	4584715.9910
5026	Control_Box	4807.49	218144.4700	4584720.4590
5027	Compressor	4810.10	218145.5310	4584720.6360
5029	Drain_Pipe	4810.81	218143.3820	4584705.1600
5030	Drain_Pipe	4810.74	218086.9520	4584655.5030
5031	Drain_Pipe	4809.25	218079.3100	4584662.4840
5032	Drain_Pipe	4809.16	218137.0660	4584711.3840
5033	Valve_Box	4808.78	218106.0990	4584690.3310
5034	Inspection_Port	4809.02	218109.3220	4584690.5330
5035	Tank_Vent	4808.16	218157.7870	4584725.5950
5036	Field	4813.13	218163.1640	4584686.3260
5037	Field	4812.45	218097.3160	4584634.8510
5038	Field	4808.15	218072.2630	4584663.0560
5039	Field	4807.90	218138.4610	4584718.5890

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM — c —
UNDERGROUND POWER — e —
WATERLINE — w —
RETAINING WALL
STORMWATER DRAINAGE CHANNEL

ASPHALT
CONCRETE
GRAVEL
DECK

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT AQ
FINAL LIFT
TOPOGRAPHIC SURVEY

ADKINS CONSULTING ENGINEERING, LLP
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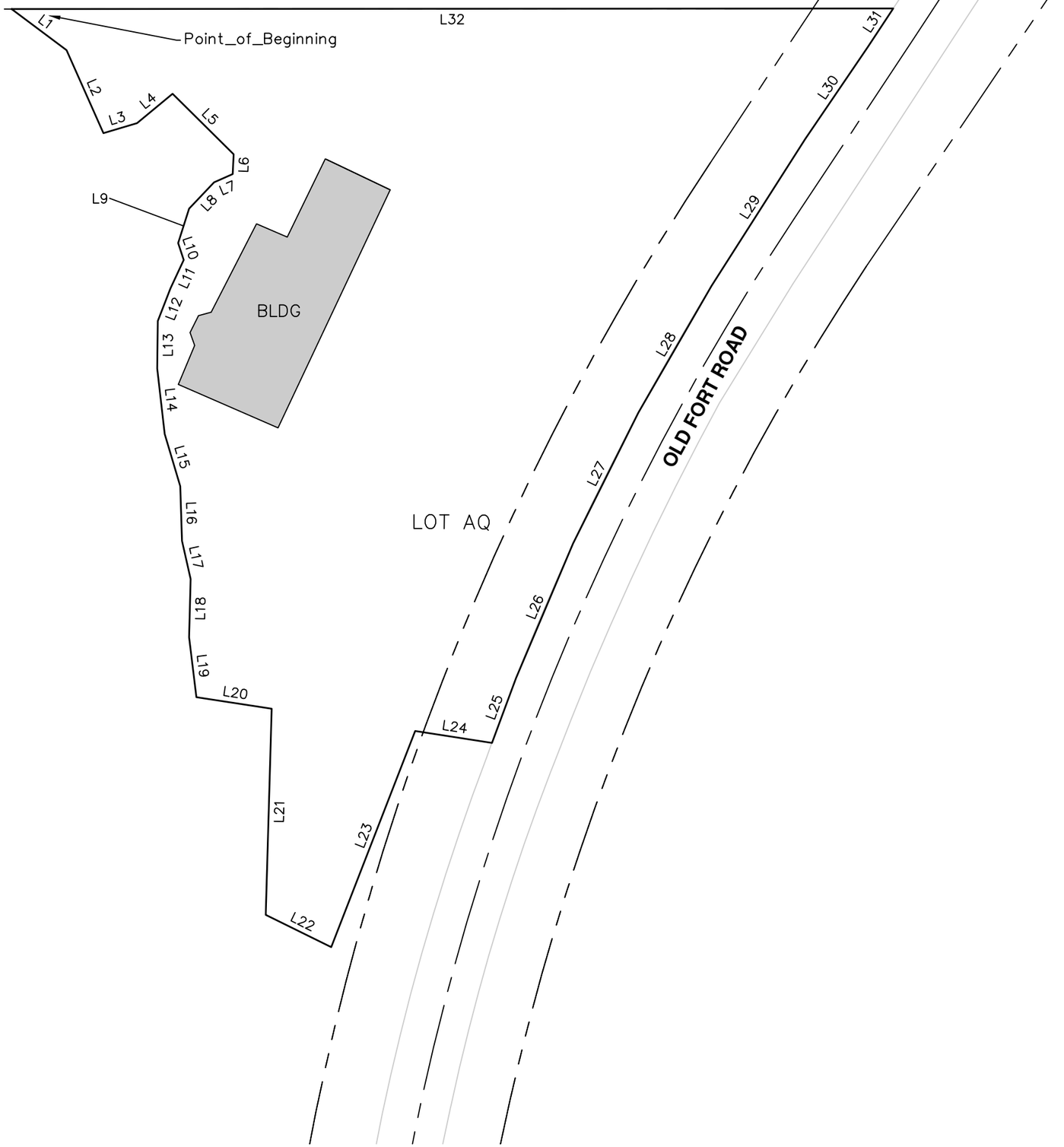
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

AQ.3



REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

40' 0 20' 40'
(FEET)

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT AQ
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

AQ.4

Line Table		
Line #	Length	Direction
L1	23.77	S53° 09' 26"E
L2	31.49	S24° 01' 20"E
L3	12.21	N73° 26' 18"E
L4	15.99	N50° 24' 13"E
L5	29.85	S45° 11' 19"E
L6	6.85	S02° 26' 09"W
L7	7.10	S65° 59' 27"W
L8	12.60	S43° 32' 46"W
L9	12.54	S17° 40' 29"W
L10	6.16	S18° 33' 20"E
L11	10.89	S25° 13' 16"W
L12	12.18	S21° 12' 21"W
L13	16.47	S00° 39' 57"W
L14	22.88	S06° 34' 00"E
L15	18.93	S16° 38' 19"E
L16	18.90	S01° 40' 35"E
L17	13.62	S12° 55' 07"E
L18	20.19	S01° 32' 59"W
L19	20.95	S06° 59' 51"E
L20	26.40	S81° 11' 11"E

Line Table		
Line #	Length	Direction
L21	71.55	S01° 38' 19"W
L22	25.33	S63° 51' 35"E
L23	80.42	N21° 14' 38"E
L24	26.96	S81° 11' 11"E
L25	23.96	N20° 16' 48"E
L26	50.76	N23° 01' 43"E
L27	50.77	N26° 31' 08"E
L28	50.78	N30° 00' 27"E
L29	60.49	N32° 32' 06"E
L30	38.63	N34° 12' 04"E
L31	15.96	N33° 24' 38"E
L32	305.98	S89° 57' 17"W

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OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

40' 0 20' 40'
(FEET)

EXCAVATION DESCRIPTION FOR LOT AQ

A PORTION OF LOT 1, BLOCK 1 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE SW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S10°31'04"E A DISTANCE OF 4969.47 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S53°09'26"E 23.77 FEET
- S24°01'20"E 31.49 FEET
- N73°26'18"E 12.21 FEET
- N50°24'13"E 15.99 FEET
- S45°11'19"E 29.85 FEET
- S02°26'09"W 6.85 FEET
- S65°59'27"W 7.10 FEET
- S43°32'46"W 12.60 FEET
- S17°40'29"W 12.54 FEET
- S18°33'20"E 6.16 FEET
- S25°13'16"W 10.89 FEET
- S21°12'21"W 12.18 FEET
- S00°39'57"W 16.47 FEET
- S06°34'00"E 22.88 FEET
- S16°38'19"E 18.93 FEET
- S01°40'35"E 18.90 FEET
- S12°55'07"E 13.62 FEET
- S01°32'59"W 20.19 FEET
- S06°59'51"E 20.95 FEET
- S81°11'11"E 26.40 FEET
- S01°38'19"W 71.55 FEET
- S63°51'35"E 25.33 FEET
- N21°14'38"E 80.42 FEET
- S81°11'11"E 26.96 FEET
- N20°16'48"E 23.96 FEET
- N23°01'43"E 50.76 FEET
- N26°31'08"E 50.77 FEET
- N30°00'27"E 50.78 FEET
- N32°32'06"E 60.49 FEET
- N34°12'04"E 38.63 FEET
- N33°24'38"E 15.96 FEET
- S89°57'17"W 305.98 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N67°11'17"E A DISTANCE OF 1077.26 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 1.70 ACRES, MORE OR LESS.

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT AQ
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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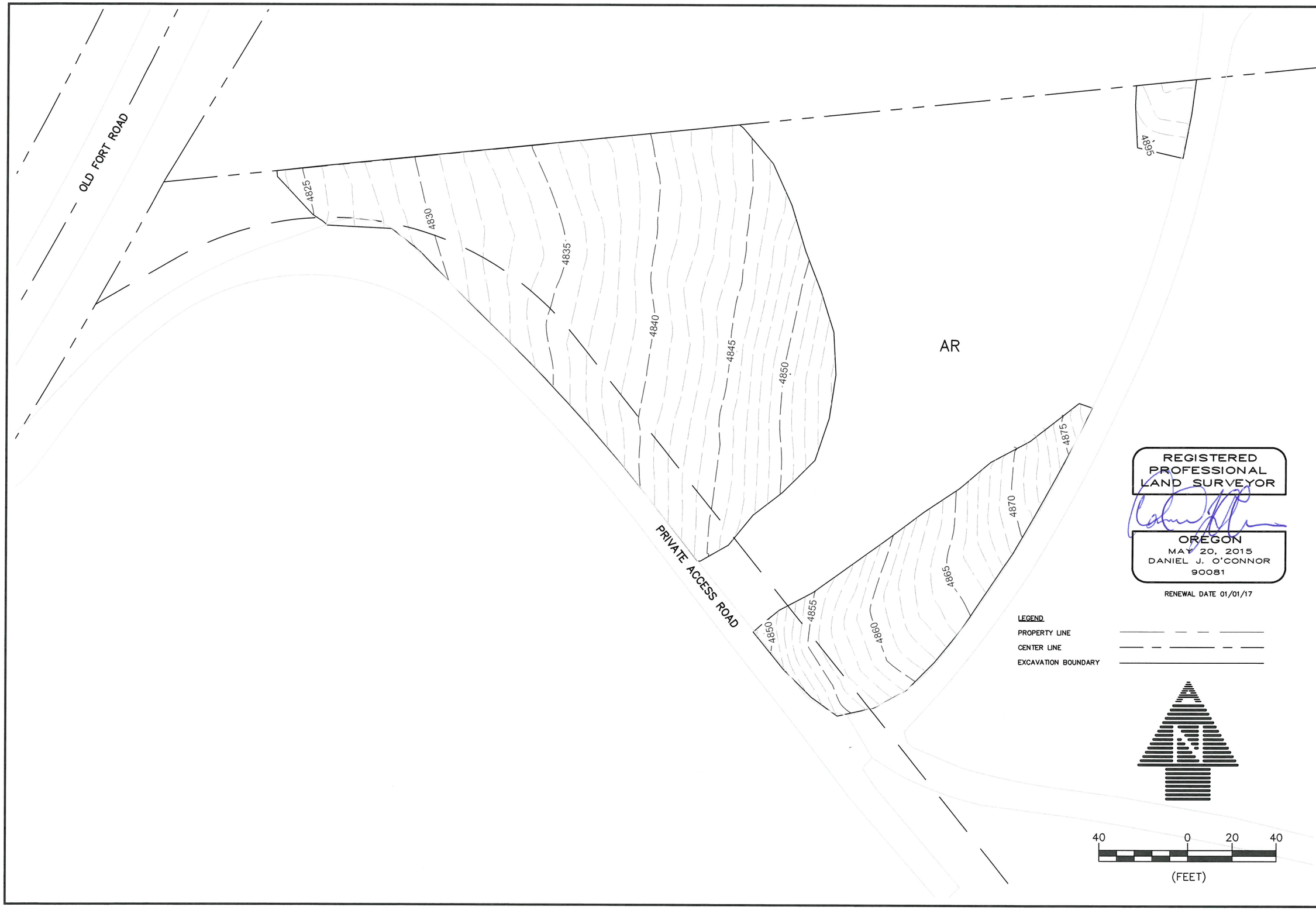
SCALE:	AS SHOWN

AQ.5



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NORTHRIDGE REMEDIATION
LOT AR
FINAL SURFACE AS-BUILT
TOPOGRAPHIC SURFACE

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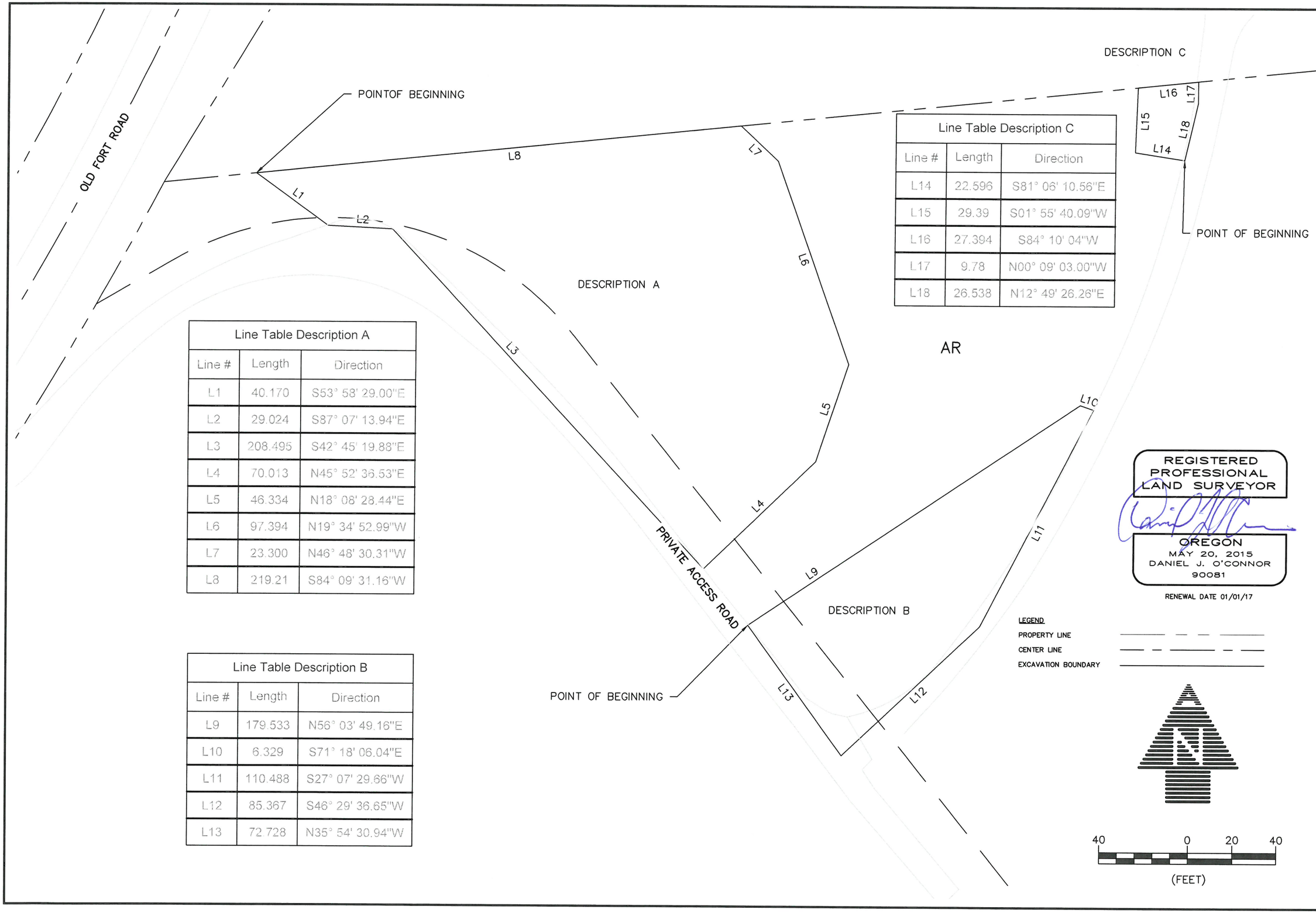
SCALE:	1" = 40'

AR.3



Line Table Description A		
Line #	Length	Direction
L1	40.170	S53° 58' 29.00"E
L2	29.024	S87° 07' 13.94"E
L3	208.495	S42° 45' 19.88"E
L4	70.013	N45° 52' 36.53"E
L5	46.334	N18° 08' 28.44"E
L6	97.394	N19° 34' 52.99"W
L7	23.300	N46° 48' 30.31"W
L8	219.21	S84° 09' 31.16"W

Line Table Description B		
Line #	Length	Direction
L9	179.533	N56° 03' 49.16"E
L10	6.329	S71° 18' 06.04"E
L11	110.488	S27° 07' 29.66"W
L12	85.367	S46° 29' 36.65"W
L13	72.728	N35° 54' 30.94"W

Line Table Description C		
Line #	Length	Direction
L14	22.596	S81° 06' 10.56"E
L15	29.39	S01° 55' 40.09"W
L16	27.394	S84° 10' 04"W
L17	9.78	N00° 09' 03.00"W
L18	26.538	N12° 49' 26.26"E

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NORTHRIDGE REMEDIATION
LOT AR
AS-BUILT
DESCRIPTION EXHIBIT

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AR.4

EXCAVATION DESCRIPTION A FOR LOT AR

A PORTION OF LOT 2, BLOCK 3 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE SE¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S16°24'18"E A DISTANCE OF 4930.48 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S53°58'29"E 40.17 FEET
- S87°07'14"E 29.02 FEET
- S42°45'20"E 208.50 FEET
- N45°52'37"E 70.01 FEET
- N18°08'28"E 46.33 FEET
- N19°34'53"W 97.39 FEET
- N46°48'30"W 23.30 FEET
- S84°09'31"W 219.21 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N68°47'03"E DISTANCE OF 1585.85 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.6 ACRES, MORE OR LESS.

EXCAVATION DESCRIPTION B FOR LOT AR

A PORTION OF LOT 2, BLOCK 3 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE SE¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S18°08'02"E A DISTANCE OF 5191.22 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N56°03'49"E 179.53 FEET
- S71°18'06"E 6.33 FEET
- S27°07'30"W 110.49 FEET
- S46°29'37"W 85.37 FEET
- N35°54'31"W 77.73 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N77°43'24"E DISTANCE OF 1741.40 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.20 ACRES, MORE OR LESS.

EXCAVATION DESCRIPTION C FOR LOT AR

A PORTION OF LOT 2, BLOCK 3 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE SE¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S28°58'09"E A DISTANCE OF 5057.36 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S81°06'11"E 22.60 FEET
- S01°55'40"W 29.40 FEET
- S84°10'04"W 27.39 FEET
- N00°09'03"W 9.78 FEET
- N12°49'26"E 26.54 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N72°57'10"E DISTANCE OF 1983.80 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.02 ACRES, MORE OR LESS.

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SCALE:	

AR.5

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/19

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT AS
FINAL SURFACE AS-BUILT
TOPOGRAPHIC SURFACE

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SURVEYED BY:	DNN
SCALE:	1" = 20'

AS.3

Line Table		
Line #	Length	Direction
L1	31.107	N59° 03' 24.25"E
L2	193.436	N79° 42' 02.96"E
L3	14.693	N17° 26' 58.68"E
L4	32.751	N07° 29' 44.24"E
L5	246.543	S85° 34' 58.15"W
L6	75.051	S14° 46' 17.37"E
L7	5.598	S10° 16' 19.98"E

EXCAVATION DESCRIPTION A FOR LOT AS

A PORTION OF LOT 4, BLOCK 3 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NE¼ SE¼ AND THE SE¼ OF THE SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S21°15'36"E A DISTANCE OF 4210.01 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES: N59°03'24"E 31.11 FEET

- N79°42'03"E 193.44 FEET
- N17°26'59"E 14.69 FEET
- N07°29'44"E 32.75 FEET
- S85°34'58"W 246.54 FEET
- S14°46'17"E 75.05 FEET
- S10°26'17"E 5.60 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N49°26'16"E DISTANCE OF 2122.43 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.31 ACRES, MORE OR LESS.

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OREGON
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DANIEL J. O'CONNOR
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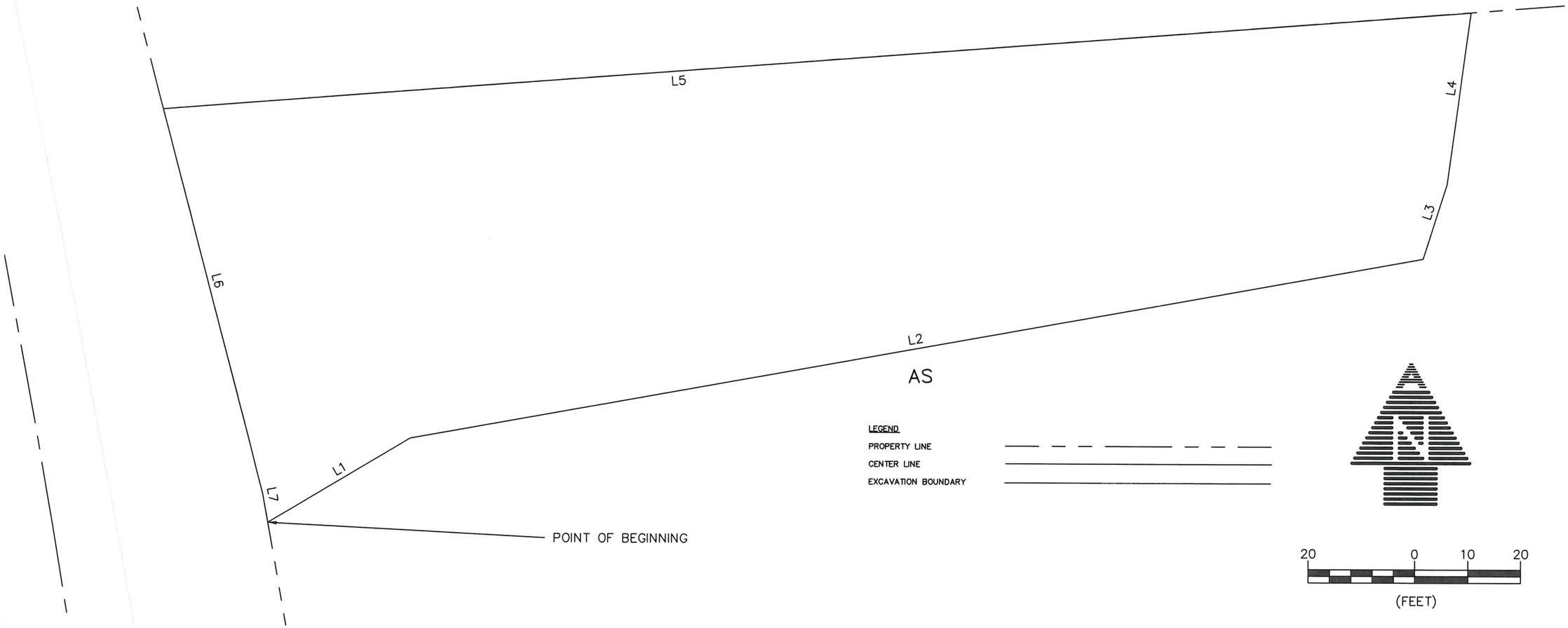
RENEWAL DATE 01/01/13



No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT AS
AS-BUILT
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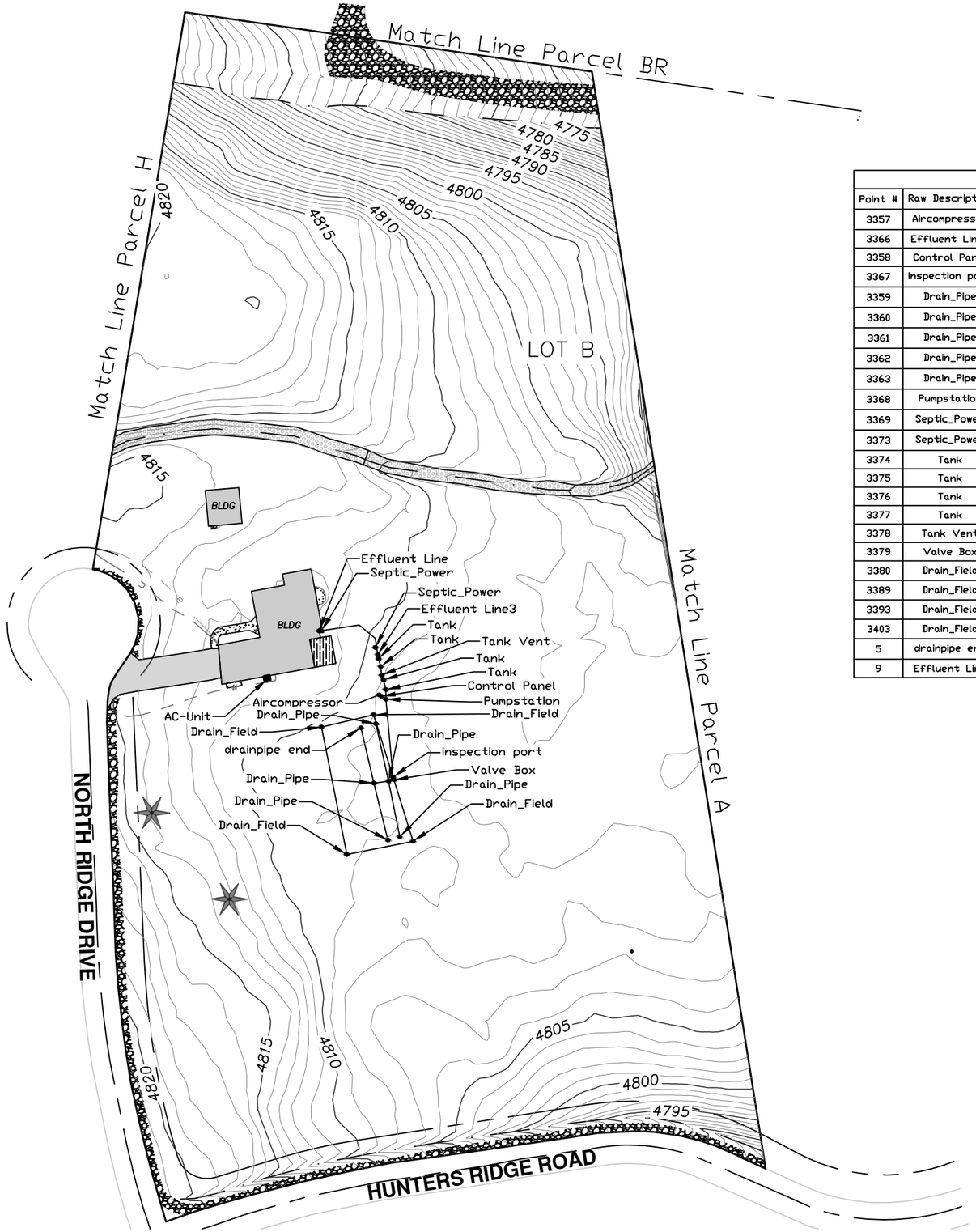
AS.4



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
3357	Aircompressor	4809.72	220920.3180	4583164.4300
3366	Effluent Line3	4808.26	220946.4500	4583163.5870
3358	Control Panel	4807.73	220919.4730	4583165.8720
3367	inspection port	4808.76	220866.7270	4583173.5700
3359	Drain_Pipe	4808.39	220864.0680	4583170.6850
3360	Drain_Pipe	4808.37	220862.8390	4583161.0220
3361	Drain_Pipe	4808.84	220901.4750	4583162.4270
3362	Drain_Pipe	4808.90	220827.8040	4583177.9300
3363	Drain_Pipe	4808.84	220825.6820	4583170.3250
3368	Pumpstation	4808.38	220917.5210	4583168.8840
3369	Septic_Power	4807.93	220951.2570	4583162.0180
3373	Septic_Power	4809.82	220961.9840	4583126.8210
3374	Tank	4809.39	220943.9740	4583164.1220
3375	Tank	4809.34	220938.8100	4583165.5070
3376	Tank	4808.88	220930.2200	4583167.3260
3377	Tank	4808.84	220923.8120	4583168.9060
3378	Tank Vent	4810.22	220933.2000	4583166.1040
3379	Valve Box	4808.72	220864.9410	4583174.1210
3380	Drain_Field	4806.04	220824.9110	4583186.6280
3389	Drain_Field	4807.58	220907.3850	4583160.9320
3393	Drain_Field	4807.93	220899.3850	4583126.9110
3403	Drain_Field	4807.58	220816.3310	4583143.3950
5	drainpipe end	4808.82	220898.8560	4583152.6370
9	Effluent Line	4808.65	220962.0040	4583125.3420

80 0 40 80

(FEET)

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DANIEL J. O'CONNOR
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LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM
UNDERGROUND POWER
WATERLINE
STORMWATER DRAINAGE CHANNEL

TREE
DECK
ASPHALT
CONCRETE
OVERSIZED MATERIAL
GRAVEL SHOULDER

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT B
FINAL LIFT
TOPOGRAPHIC SURVEY

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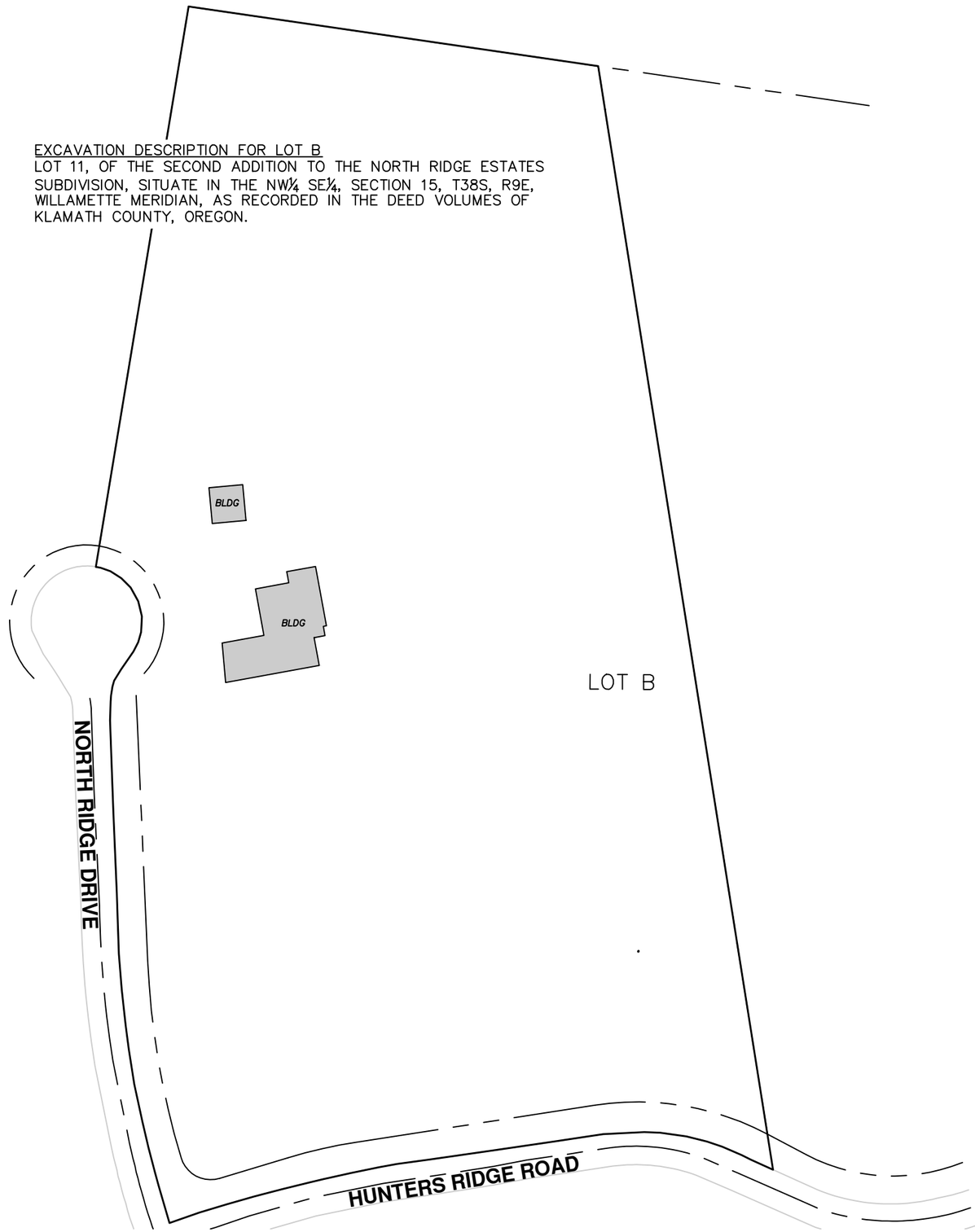
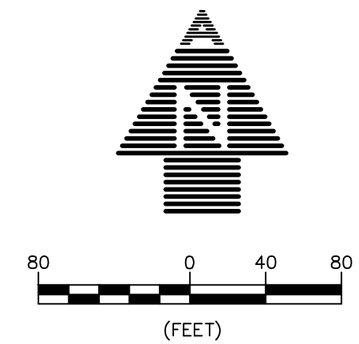
SCALE:	AS SHOWN

B.3

EXCAVATION DESCRIPTION FOR LOT B

LOT 11, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.





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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT B

LEGAL DESCRIPTION

TOPOGRAPHIC SURVEY

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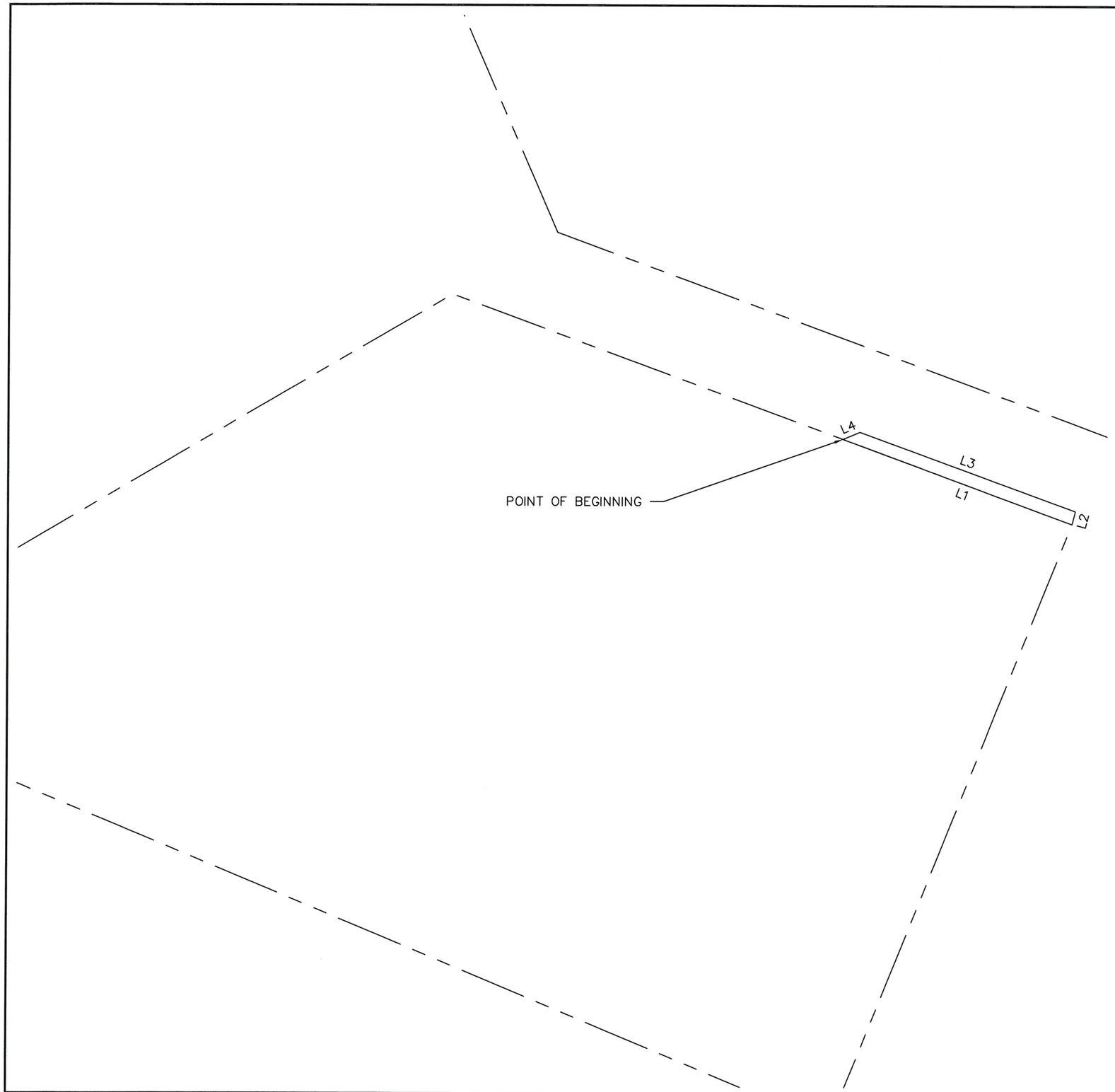
B.4



Line Table		
Line #	Length	Direction
L1	68.540	S69° 43' 40.98"E
L2	3.758	N14° 29' 03.45"E
L3	64.368	N69° 55' 47.50"W
L4	5.169	S67° 28' 45.96"W

EXCAVATION DESCRIPTION FOR LOT BI

A PORTION OF LOT 3, OF THE FIRST ADDITION TO NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NE¼ SE¼ AND THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S27°02'52"E A DISTANCE OF 3249.07 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S69°43'41"E 68.54 FEET
- N14°29'04"E 3.76 FEET
- N69°55'48"W 64.37 FEET
- S67°28'46"W 5.17 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N32°58'18"E DISTANCE OF 2872.60 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.006 ACRES, MORE OR LESS.

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/17

30 0 15 30
(FEET)

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT BI
AS-BUILT

EXCAVATION DESCRIPTION

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SURVEYED BY:	DNN
SCALE:	1"=30'

BI.1

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/19

LEGEND

PROPERTY LINE

CENTER LINE

EXCAVATION BOUNDARY

30 0 15 30

(FEET)

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT BJ
FINAL SURFACE AS-BUILT
TOPOGRAPHIC SURFACE

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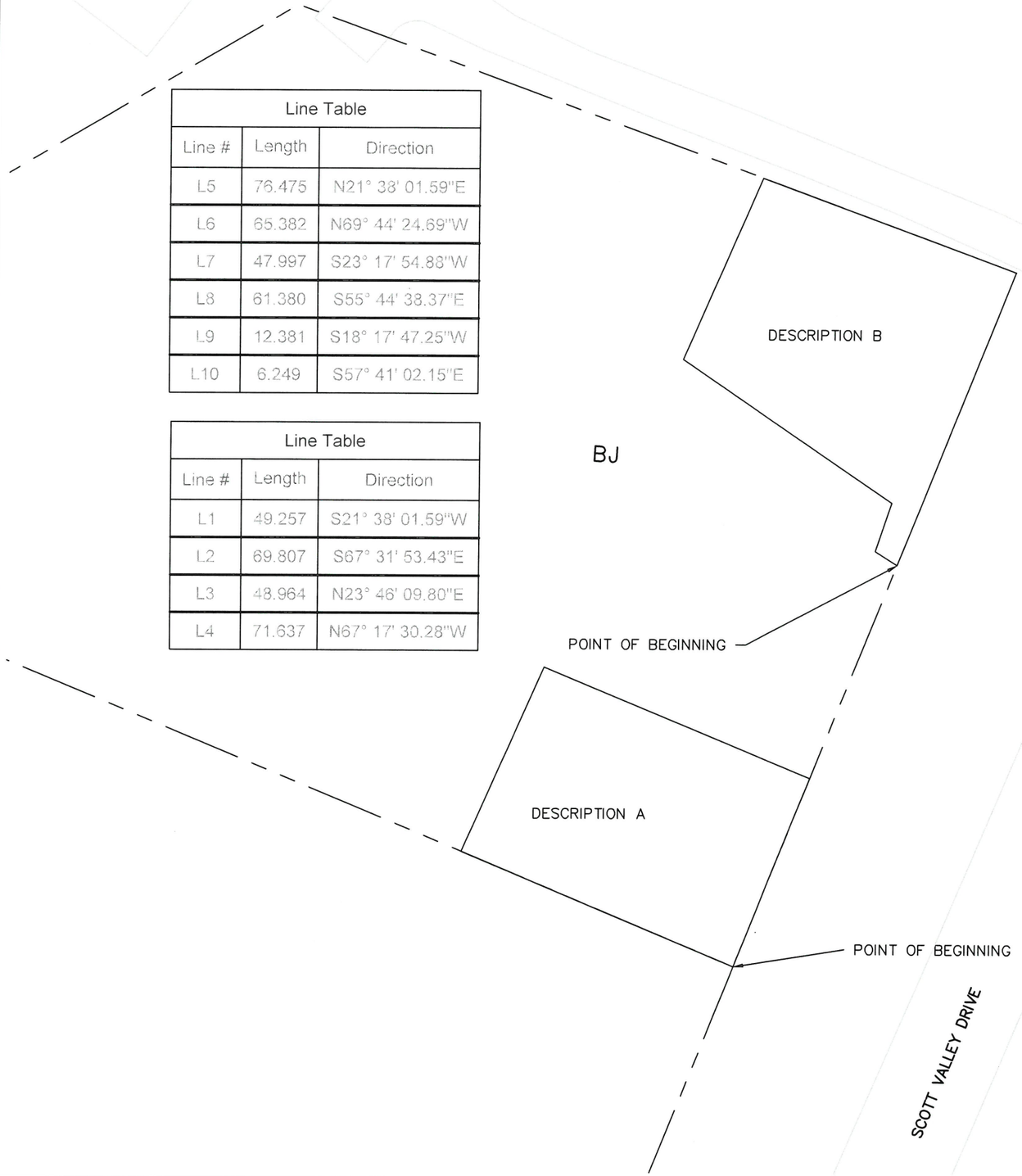
SURVEYED BY:	DNN
SCALE:	1" = 30'

BJ.3

Line Table		
Line #	Length	Direction
L5	76.475	N21° 38' 01.59"E
L6	65.382	N69° 44' 24.69"W
L7	47.997	S23° 17' 54.88"W
L8	61.380	S55° 44' 38.37"E
L9	12.381	S18° 17' 47.25"W
L10	6.249	S57° 41' 02.15"E

Line Table		
Line #	Length	Direction
L1	49.257	S21° 38' 01.59"W
L2	69.807	S67° 31' 53.43"E
L3	48.964	N23° 46' 09.80"E
L4	71.637	N67° 17' 30.28"W



EXCAVATION DESCRIPTION B FOR LOT BJ

A PORTION OF LOT 1, OF THE FIRST ADDITION TO NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NE¼ SE¼ AND THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S26°51'37"E A DISTANCE OF 3349.97 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N21°38'02"E 76.48 FEET
- N69°44'25"E 65.38 FEET
- S23°17'55"W 48.00 FEET
- S55°44'38"E 61.38 FEET
- S18°17'47"W 12.38 FEET
- S57°41'02"E 6.25 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N34°38'22"E DISTANCE OF 2813.88 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.09 ACRES, MORE OR LESS.

EXCAVATION DESCRIPTION A FOR LOT BJ

A PORTION OF LOT 1, OF THE FIRST ADDITION TO NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NE¼ SE¼ AND THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S25°32'38"E A DISTANCE OF 3420.40 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S21°38'02"E 49.26 FEET
- S67°31'53"E 69.81 FEET
- N23°46'10"E 48.96 FEET
- N67°17'30"W 71.64 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N35°08'18"E DISTANCE OF 2711.75 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.08 ACRES, MORE OR LESS.

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081
RENEWAL DATE 01/01/19

LEGEND
PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY

30 0 15 30
(FEET)

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT BJ
AS-BUILT
EXCAVATION DESCRIPTION

ADKINS CONSULTING ENGINEERING, LLP
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DATE:	12/20/2016
PROJECT:	3405-01
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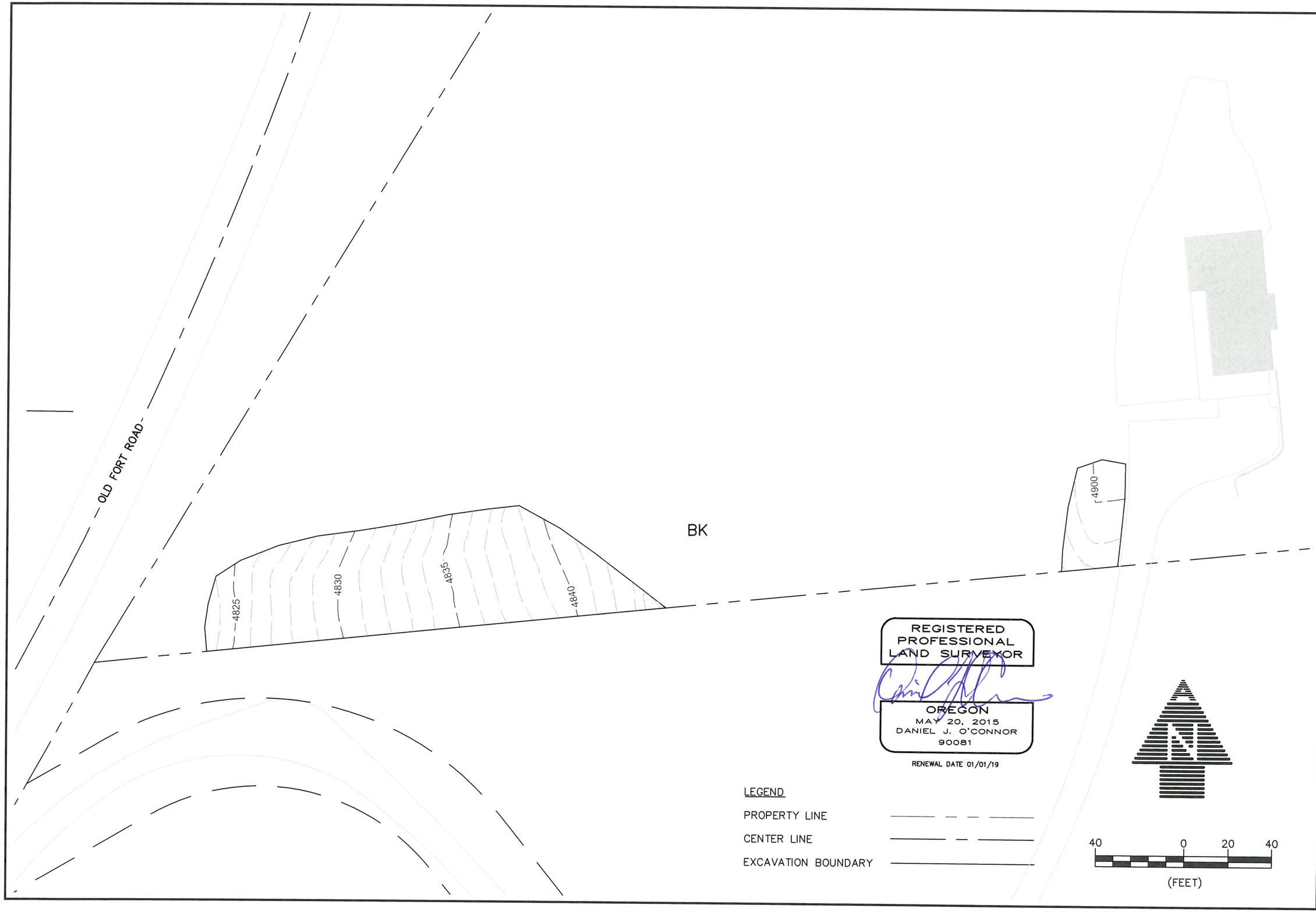
DRAWN BY:	SAR
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	

BJ.4



No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT BK
FINAL SURFACE AS-BUILT
TOPOGRAPHIC SURFACE

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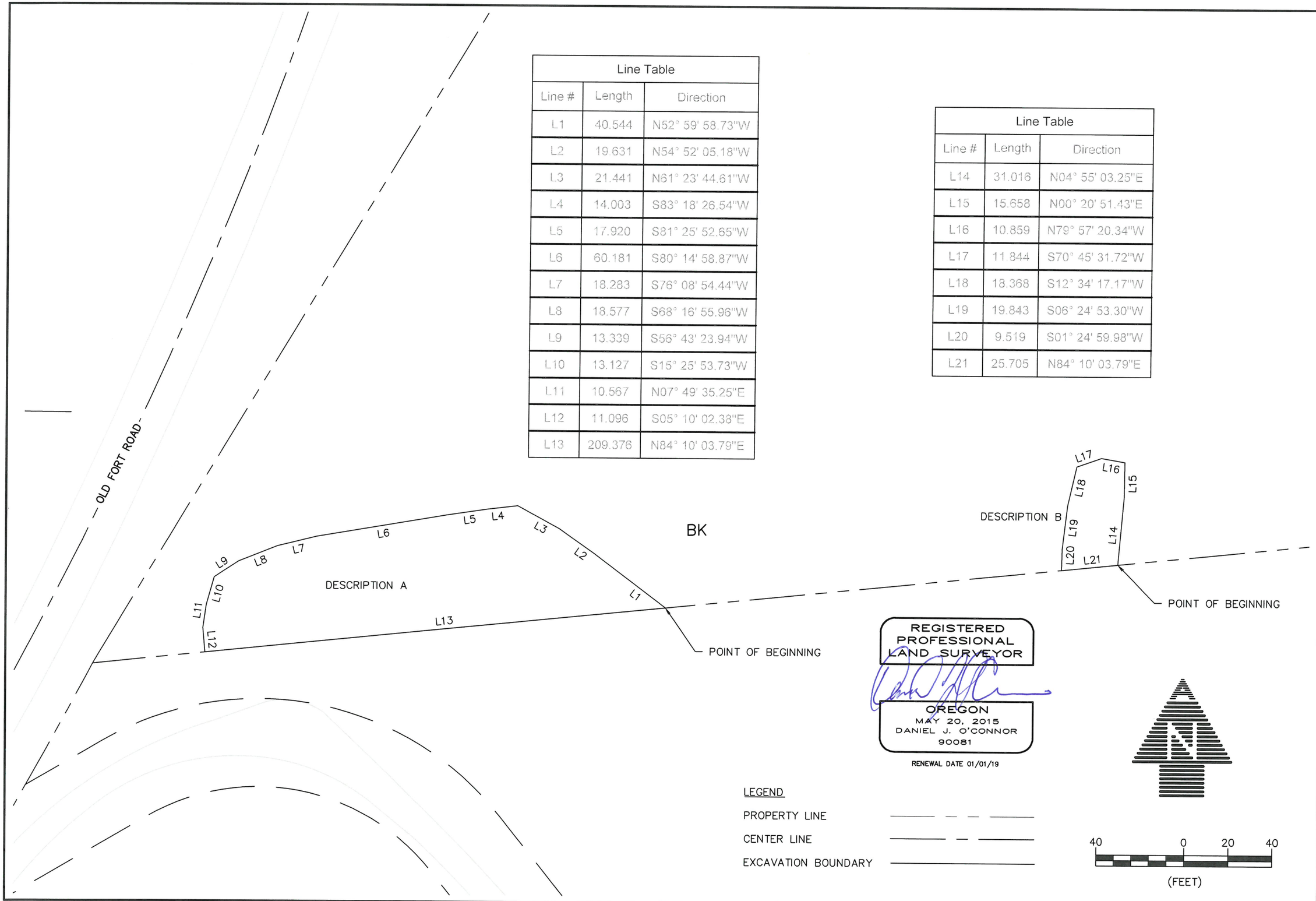
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	1" = 40'

BK.3

Line Table		
Line #	Length	Direction
L1	40.544	N52° 59' 58.73"W
L2	19.631	N54° 52' 05.18"W
L3	21.441	N61° 23' 44.61"W
L4	14.003	S83° 18' 26.54"W
L5	17.920	S81° 25' 52.65"W
L6	60.181	S80° 14' 58.87"W
L7	18.283	S76° 08' 54.44"W
L8	18.577	S68° 16' 55.96"W
L9	13.339	S56° 43' 23.94"W
L10	13.127	S15° 25' 53.73"W
L11	10.567	N07° 49' 35.25"E
L12	11.096	S05° 10' 02.38"E
L13	209.376	N84° 10' 03.79"E

Line Table		
Line #	Length	Direction
L14	31.016	N04° 55' 03.25"E
L15	15.658	N00° 20' 51.43"E
L16	10.859	N79° 57' 20.34"W
L17	11.844	S70° 45' 31.72"W
L18	18.368	S12° 34' 17.17"W
L19	19.843	S06° 24' 53.30"W
L20	9.519	S01° 24' 59.98"W
L21	25.705	N84° 10' 03.79"E



No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT BK
AS-BUILT
DESCRIPTION EXHIBITS

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CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	1" = 40'

BK.4

EXCAVATION DESCRIPTION B FOR LOT BK

A PORTION OF LOT 3, BLOCK 3, OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE SE¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S18°53'10"E A DISTANCE OF 4975.35 FEET FROM THE $\frac{1}{4}$ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N52°52'59"W 40.54 FEET
- N54°52'05"W 19.63 FEET
- N61°23'45"W 21.44 FEET
- S83°18'27"W 14.00 FEET
- S81°25'53"W 17.92 FEET
- S80°14'59"W 60.18 FEET
- S76°08'54"W 18.28 FEET
- S68°16'56"W 18.58 FEET
- S56°43'24"W 13.34 FEET
- S15°25'54"W 13.13 FEET
- N07°49'35"E 10.58 FEET
- S05°10'02"E 11.10 FEET
- N84°10'04"E 209.38 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N70°38'11"E DISTANCE OF 1798.04 FEET FROM THE $\frac{1}{4}$ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.20 ACRES, MORE OR LESS.

EXCAVATION DESCRIPTION B FOR LOT BK

A PORTION OF LOT 3, BLOCK 3, OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE SE¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S21°10'20"E A DISTANCE OF 5025.83 FEET FROM THE $\frac{1}{4}$ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N04°55'03"E 31.02 FEET
- N00°20'51"E 15.66 FEET
- N79°57'20"W 10.86 FEET
- S70°45'32"W 11.84 FEET
- S12°34'17"W 18.37 FEET
- S06°24'53"W 19.84 FEET
- S01°25'00"W 9.52 FEET
- N84°10'04"E 25.71 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N72°01'01"E DISTANCE OF 1998.70 FEET FROM THE $\frac{1}{4}$ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.03 ACRES, MORE OR LESS.

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/19

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT BK
AS-BUILT
LEGAL DESCRIPTIONS

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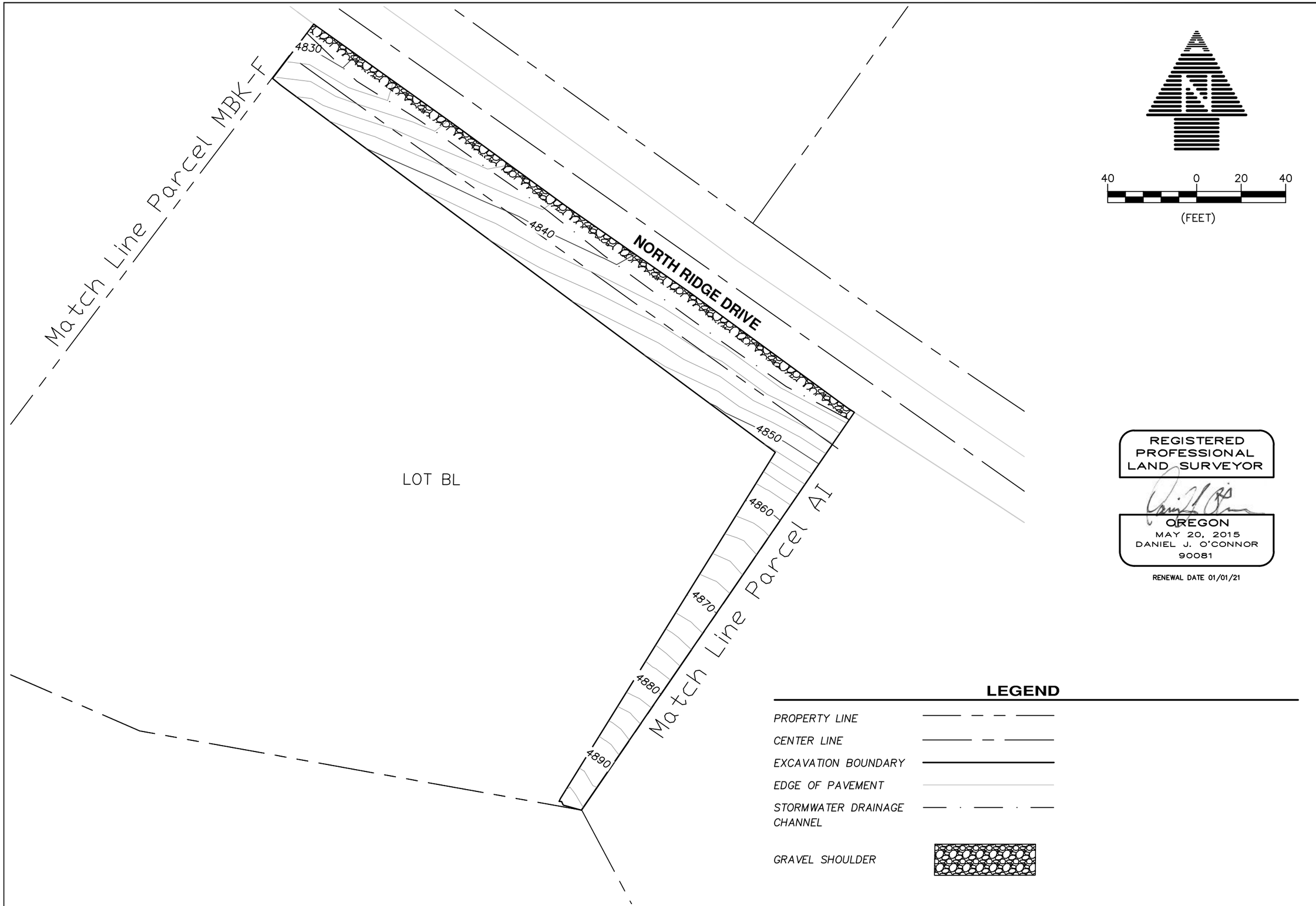
CHECKED BY:	DJO
SURVEYED BY:	
SCALE:	

BK.5



REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BL
FINAL LIFT
TOPOGRAPHIC SURVEY

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DRAWN BY:	ZEF
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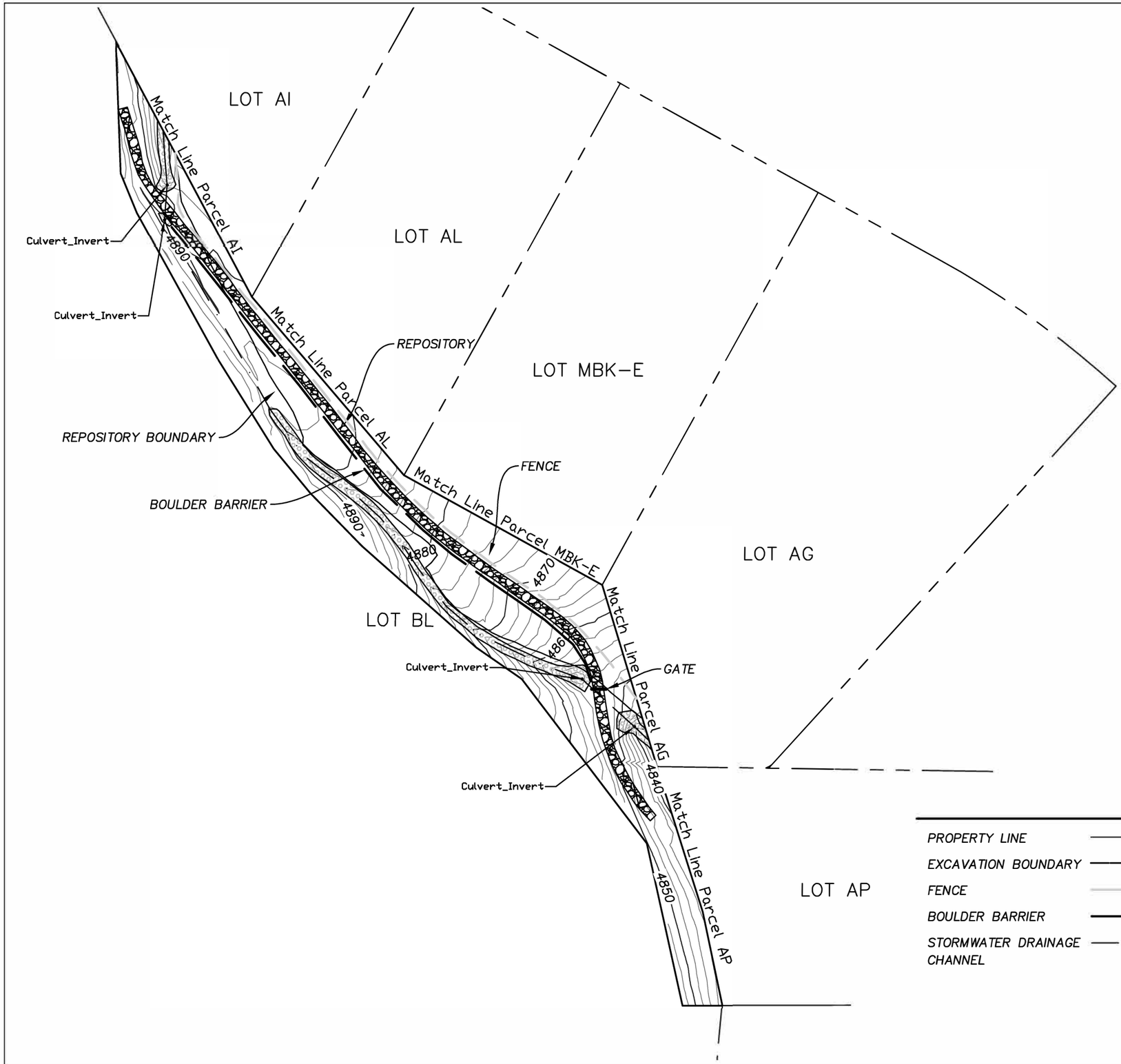
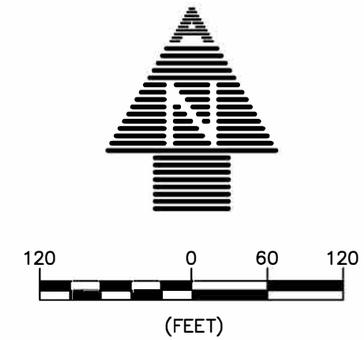
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BL.5





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OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
EXCAVATION BOUNDARY	
FENCE	
BOULDER BARRIER	
STORMWATER DRAINAGE CHANNEL	
OVERSIZED MATERIAL	
GRAVEL ROAD	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BL
FINAL LIFT
TOPOGRAPHIC SURVEY

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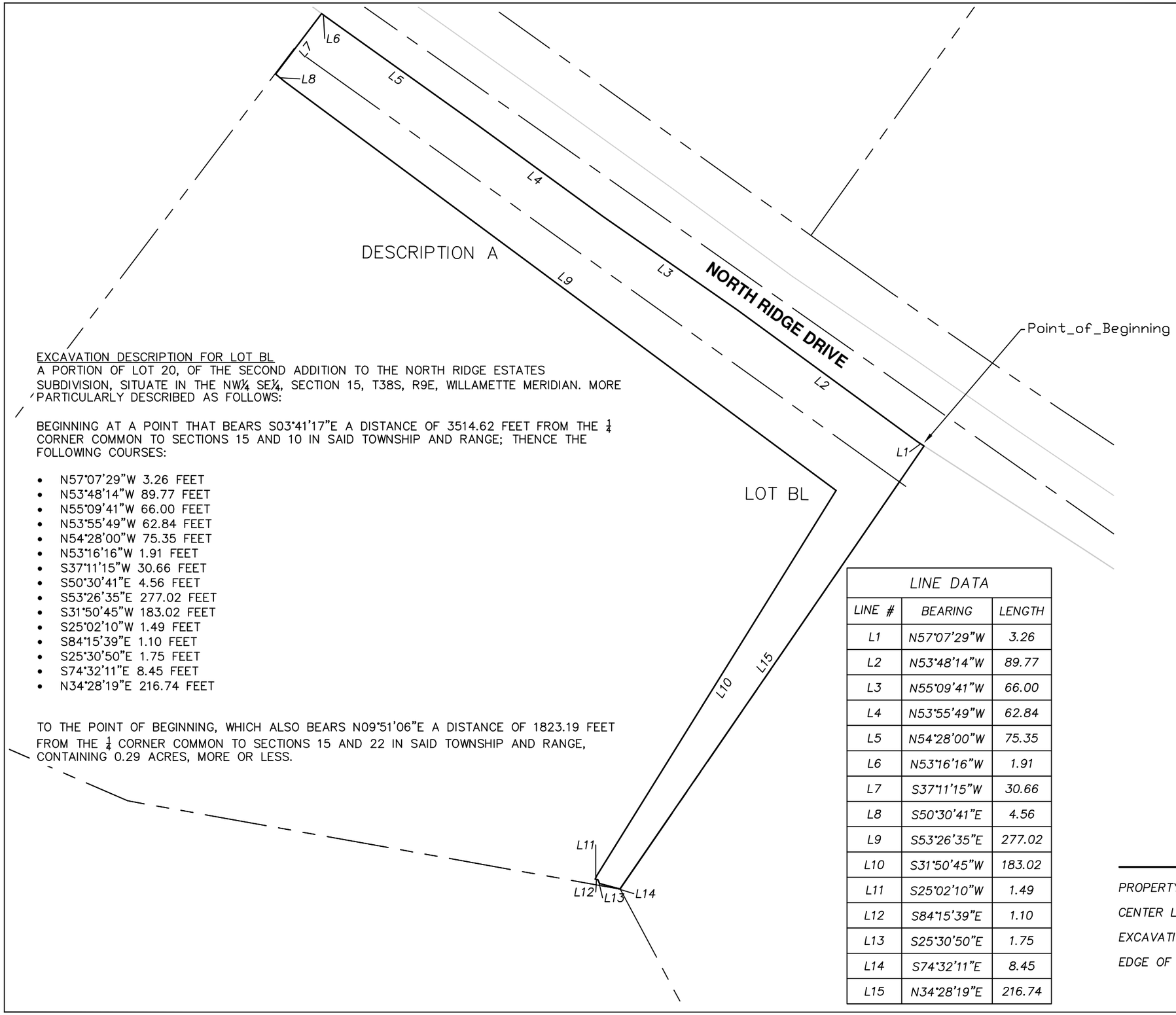
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BL.6



EXCAVATION DESCRIPTION FOR LOT BL

A PORTION OF LOT 20, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S03°41'17"E A DISTANCE OF 3514.62 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N57°07'29"W 3.26 FEET
- N53°48'14"W 89.77 FEET
- N55°09'41"W 66.00 FEET
- N53°55'49"W 62.84 FEET
- N54°28'00"W 75.35 FEET
- N53°16'16"W 1.91 FEET
- S37°11'15"W 30.66 FEET
- S50°30'41"E 4.56 FEET
- S53°26'35"E 277.02 FEET
- S31°50'45"W 183.02 FEET
- S25°02'10"W 1.49 FEET
- S84°15'39"E 1.10 FEET
- S25°30'50"E 1.75 FEET
- S74°32'11"E 8.45 FEET
- N34°28'19"E 216.74 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N09°51'06"E A DISTANCE OF 1823.19 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.29 ACRES, MORE OR LESS.

40 0 20 40
(FEET)

LINE DATA

LINE #	BEARING	LENGTH
L1	N57°07'29"W	3.26
L2	N53°48'14"W	89.77
L3	N55°09'41"W	66.00
L4	N53°55'49"W	62.84
L5	N54°28'00"W	75.35
L6	N53°16'16"W	1.91
L7	S37°11'15"W	30.66
L8	S50°30'41"E	4.56
L9	S53°26'35"E	277.02
L10	S31°50'45"W	183.02
L11	S25°02'10"W	1.49
L12	S84°15'39"E	1.10
L13	S25°30'50"E	1.75
L14	S74°32'11"E	8.45
L15	N34°28'19"E	216.74

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BL
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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PROJECT:	3405-01
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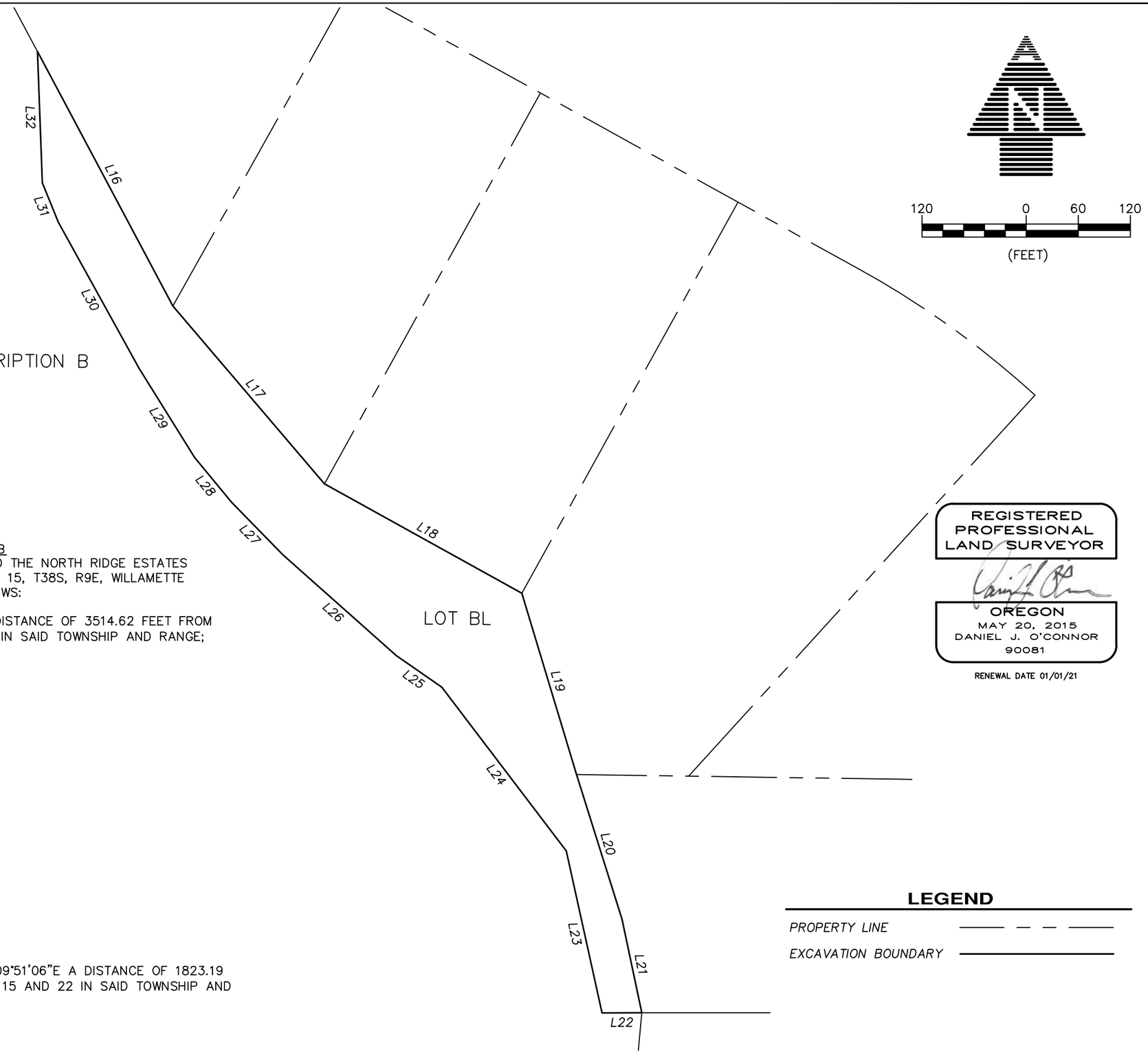
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BL.7

Line Table		
Line #	Length	Direction
L16	332.15	S28° 01′ 06″E
L17	269.11	S40° 26′ 46″E
L18	260.00	S61° 01′ 32″E
L19	217.92	S16° 46′ 35″E
L20	174.81	S17° 29′ 04″E
L21	110.14	S11° 52′ 36″E
L22	45.75	S89° 53′ 56″W
L23	190.99	N12° 25′ 56″W
L24	237.06	N37° 16′ 08″W
L25	63.35	N55° 17′ 06″W
L26	175.32	N48° 24′ 00″W
L27	84.75	N44° 18′ 04″W
L28	66.58	N39° 35′ 58″W
L29	120.68	N31° 52′ 36″W
L30	192.53	N28° 55′ 54″W
L31	49.02	N22° 04′ 37″W
L32	151.32	N02° 08′ 18″W



EXCAVATION DESCRIPTION FOR LOT BL DESCRIPTION B

A PORTION OF LOT 20, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW1/4 SE1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S03°41'17"E A DISTANCE OF 3514.62 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S28°01'06"E 332.15 FEET
- S40°26'46"E 269.11 FEET
- S61°01'32"E 260.00 FEET
- S16°46'35"E 217.92 FEET
- S17°29'04"E 174.81 FEET
- S11°52'36"E 110.14 FEET
- S89°53'56"W 45.75 FEET
- N12°25'56"W 190.99 FEET
- N37°16'08"W 237.06 FEET
- N55°17'06"W 63.35 FEET
- N48°24'00"W 175.32 FEET
- N44°18'04"W 84.75 FEET
- N39°35'58"W 66.58 FEET
- N31°52'36"W 120.68 FEET
- N28°55'54"W 192.53 FEET
- N22°04'37"W 49.02 FEET
- N02°08'18"W 151.32 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N09°51'06"E A DISTANCE OF 1823.19 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 2.39 ACRES, MORE OR LESS.

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BL
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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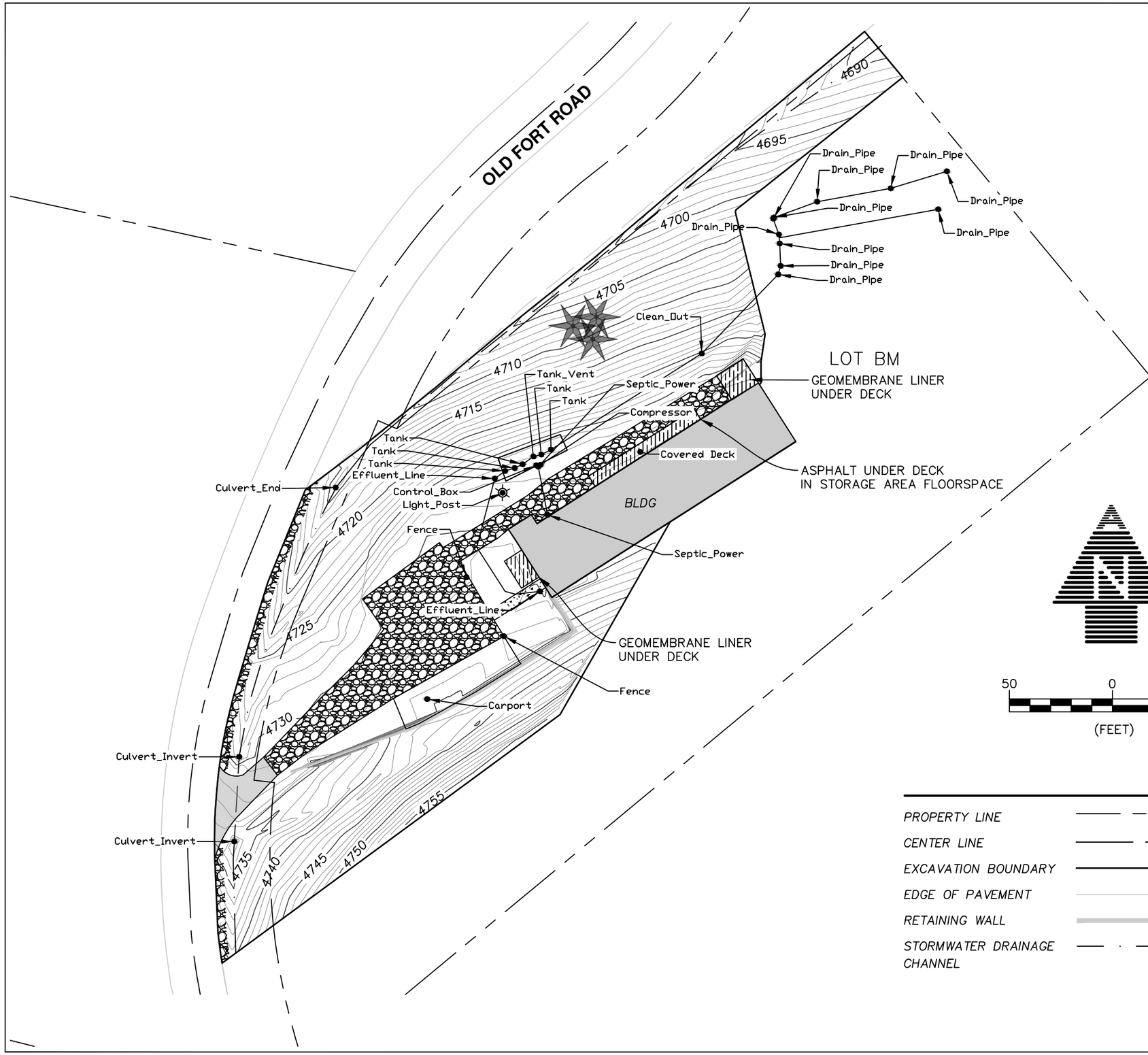
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BL.8



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
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14	Culvert_Invert	4731.61	221277.7040	4583805.6560
5000	Culvert_End	4714.94	221449.3900	4583854.8150
5008	Tank	4727.39	221460.6590	4583945.5790
5001	Effluent_Line	4731.88	221399.0540	4583954.0120
5009	Tank	4727.23	221465.3870	4583954.6090
5005	Effluent_Line	4726.09	221453.7440	4583932.0300
5006	Tank	4727.33	221457.4000	4583937.0210
5007	Tank	4726.26	221458.8210	4583941.7570
5010	Tank	4727.34	221467.7400	4583959.3460
5011	Tank_Vent	4728.23	221464.4270	4583950.7860
5012	Compressor	4728.25	221460.4430	4583954.3160
5013	Control_Box	4726.68	221460.1460	4583952.1470
5014	Septic_Power	4726.99	221459.5150	4583953.1130
5015	Septic_Power	4728.60	221436.1770	4583957.6230
5016	Clean_Out	4721.18	221514.3970	4584032.4350
5017	Drain_Pipe	4709.14	221552.7730	4584069.5360
5018	Drain_Pipe	4708.43	221556.9060	4584070.7030
5019	Drain_Pipe	4707.70	221567.7720	4584070.2900
5020	Drain_Pipe	4705.95	221572.1270	4584069.9290
5021	Drain_Pipe	4703.23	221579.7390	4584067.1750
5022	Drain_Pipe	4702.98	221580.3590	4584067.4930
5023	Drain_Pipe	4702.45	221588.0080	4584088.4410
5024	Drain_Pipe	4702.36	221594.4730	4584124.1340
5025	Drain_Pipe	4702.35	221602.7630	4584151.4110
5026	Drain_Pipe	4705.50	221584.3470	4584147.2170

50 0 25 50

(FEET)

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE		TREE	
CENTER LINE		DECK	
EXCAVATION BOUNDARY		ASPHALT	
EDGE OF PAVEMENT		CONCRETE	
RETAINING WALL		GRAVEL	
STORMWATER DRAINAGE CHANNEL			

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BM
FINAL LIFT
TOPOGRAPHIC SURVEY

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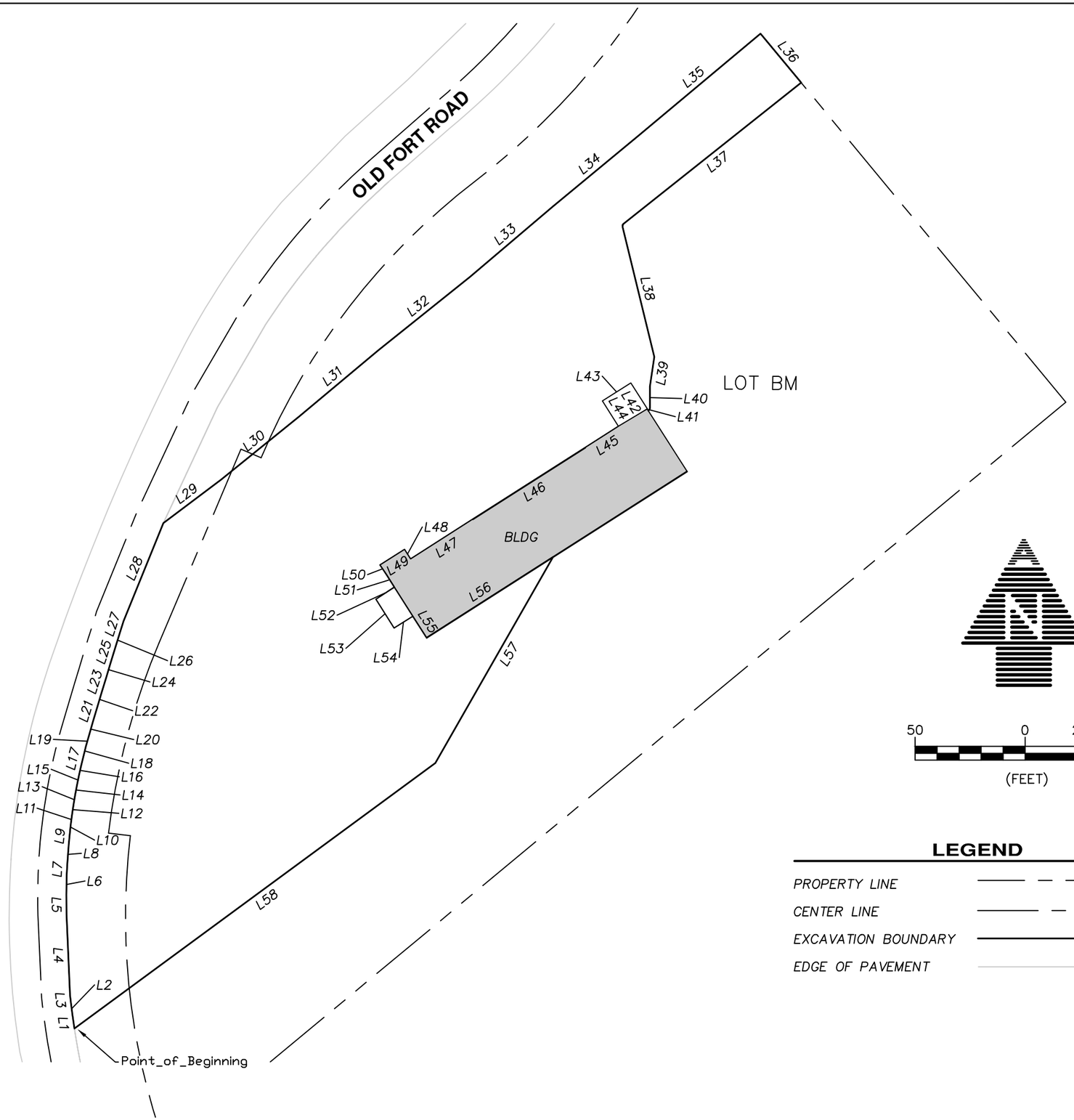
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BM.3



50 0 25 50

(FEET)

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BM
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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DATE:	2/21/2019
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BM.4

EXCAVATION DESCRIPTION FOR LOT BM

A PORTION OF PARCEL 3, OF LAND PARTITION 9–90, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY OREGON, SITUATE IN THE SW1/4 NE1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S09°16'40"E A DISTANCE OF 1784.56 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N08° 06' 07"W 6.36 FEET
- N07° 15' 28"W 5.36 FEET
- N06° 33' 27"W 3.53 FEET
- N02° 28' 23"W 36.63 FEET
- N00° 35' 08"W 9.13 FEET
- N01° 13' 13"E 9.12 FEET
- N02° 40' 48"E 4.56 FEET
- N04° 08' 28"E 9.11 FEET
- N05° 45' 04"E 6.83 FEET
- N06° 34' 47"E 2.27 FEET
- N07° 33' 24"E 4.55 FEET
- N08° 32' 03"E 4.55 FEET
- N09° 30' 45"E 4.54 FEET
- N10° 29' 30"E 4.54 FEET
- N11° 28' 19"E 4.54 FEET
- N12° 27' 10"E 4.54 FEET
- N13° 26' 06"E 4.54 FEET
- N14° 25' 04"E 4.53 FEET
- N15° 24' 06"E 4.53 FEET
- N16° 21' 51"E 7.01 FEET
- N16° 30' 38"E 7.02 FEET
- N16° 39' 23"E 7.03 FEET
- N16° 48' 07"E 7.04 FEET
- N16° 56' 51"E 7.05 FEET
- N17° 05' 33"E 7.05 FEET
- N17° 14' 14"E 7.06 FEET
- N17° 21' 58"E 5.51 FEET
- N22° 04' 41"E 48.06 FEET
- N53° 09' 54"E 32.86 FEET
- N51° 01' 58"E 45.31 FEET
- N50° 00' 23"E 47.03 FEET
- N51° 21' 00"E 53.64 FEET
- N49° 40' 38"E 49.13 FEET
- N50° 26' 08"E 50.64 FEET
- N50° 05' 16"E 72.23 FEET
- S39° 39' 27"E 28.94 FEET
- S51° 32' 02"W 103.90 FEET
- S13° 42' 21"E 61.71 FEET
- S08° 31' 51"W 13.57 FEET
- S00° 00' 00"E 10.07 FEET
- S31° 49' 39"W 1.14 FEET
- N32° 26' 27"W 14.99 FEET
- S57° 42' 06"W 15.33 FEET
- S32° 17' 54"E 13.59 FEET
- S57° 28' 16"W 17.80 FEET
- S57° 27' 34"W 60.62 FEET
- S57° 27' 34"W 33.54 FEET
- N32° 42' 30"W 5.18 FEET
- S57° 26' 38"W 13.16 FEET
- S33° 34' 28"E 4.25 FEET
- S32° 27' 02"E 7.65 FEET
- S55° 47' 56"W 10.05 FEET
- S32° 17' 20"E 15.48 FEET
- N57° 34' 09"E 10.02 FEET
- S32° 47' 12"E 11.50 FEET
- N57° 27' 34"E 68.33 FEET
- S29° 44' 42"W 108.00 FEET
- S53° 40' 54"W 203.55 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N06°01'12"E A DISTANCE OF 3562.08 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 1.03 ACRES, MORE OR LESS.

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

Line Table		
Line #	Length	Direction
L1	6.36	N08°06'07"W
L2	5.36	N07°15'28"W
L3	3.53	N06°33'27"W
L4	36.63	N02°28'23"W
L5	9.13	N00°35'08"W
L6	9.12	N01°13'13"E
L7	4.56	N02°40'48"E
L8	9.11	N04°08'28"E
L9	6.83	N05°45'04"E
L10	2.27	N06°34'47"E
L11	4.55	N07°33'24"E
L12	4.55	N08°32'03"E
L13	4.54	N09°30'45"E
L14	4.54	N10°29'30"E
L15	4.54	N11°28'19"E
L16	4.54	N12°27'10"E
L17	4.54	N13°26'06"E
L18	4.53	N14°25'04"E
L19	4.53	N15°24'06"E
L20	7.01	N16°21'51"E
L21	7.02	N16°30'38"E
L22	7.03	N16°39'23"E
L23	7.04	N16°48'07"E
L24	7.05	N16°56'51"E
L25	7.05	N17°05'33"E
L26	7.06	N17°14'14"E
L27	5.51	N17°21'58"E
L28	48.06	N22°04'41"E
L29	32.86	N53°09'54"E
L30	45.31	N51°01'58"E

Line Table		
Line #	Length	Direction
L31	47.03	N50°00'23"E
L32	53.64	N51°21'00"E
L33	49.13	N49°40'38"E
L34	50.64	N50°26'08"E
L35	72.23	N50°05'16"E
L36	28.94	S39°39'27"E
L37	103.90	S51°32'02"W
L38	61.71	S13°42'21"E
L39	13.57	S08°31'51"W
L40	10.07	S00°00'00"E
L41	1.14	S31°49'39"W
L42	14.99	N32°26'27"W
L43	15.33	S57°42'06"W
L44	13.59	S32°17'54"E
L45	17.80	S57°28'16"W
L46	60.62	S57°27'34"W
L47	33.54	S57°27'34"W
L48	5.18	N32°42'30"W
L49	13.16	S57°26'38"W
L50	4.25	S33°34'28"E
L51	7.65	S32°27'02"E
L52	10.05	S55°47'56"W
L53	15.48	S32°17'20"E
L54	10.02	N57°34'09"E
L55	11.50	S32°47'12"E
L56	68.33	N57°27'34"E
L57	108.00	S29°44'42"W
L58	203.55	S53°40'54"W

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BM
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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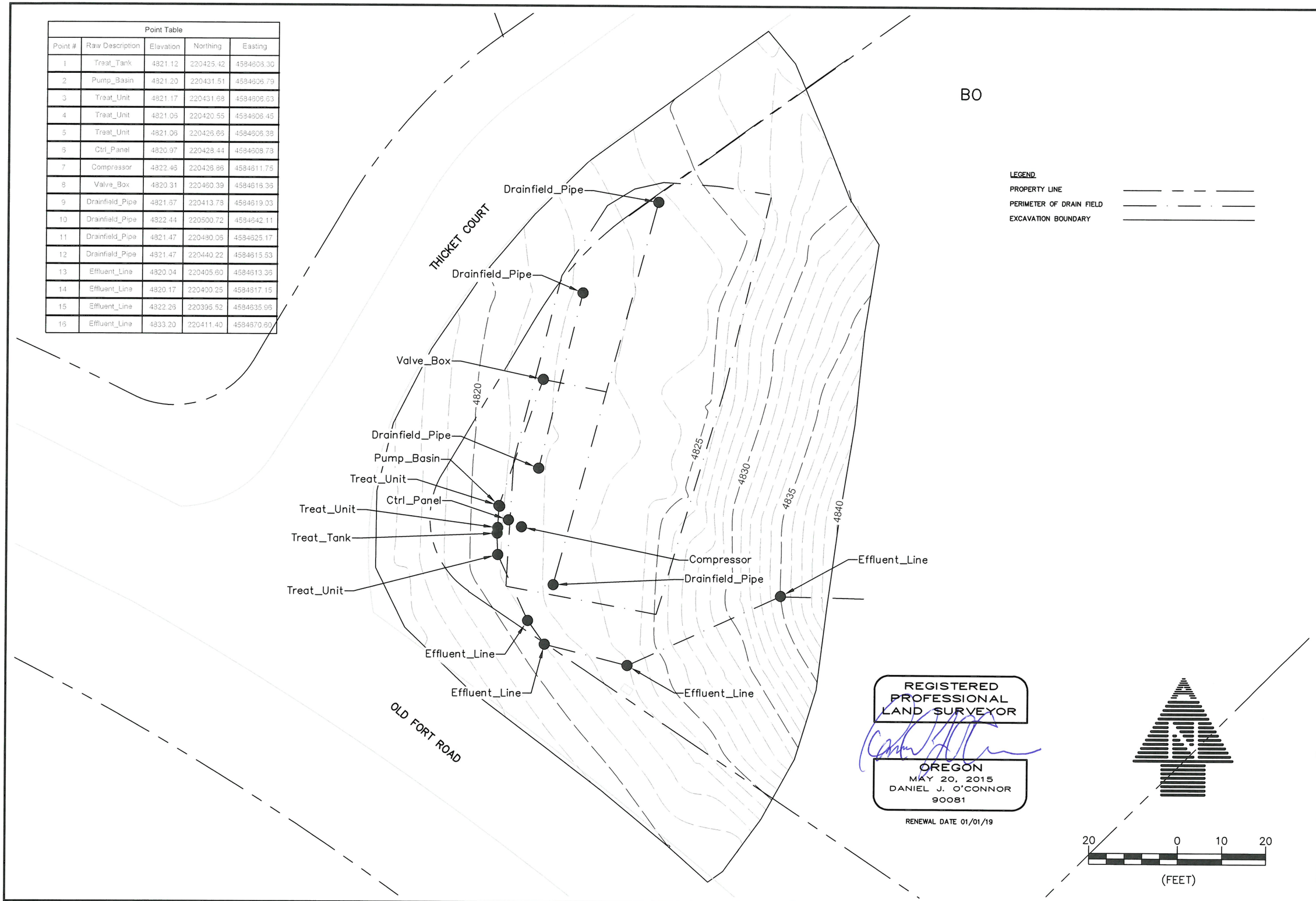
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BM.5

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
1	Treat_Tank	4821.12	220425.42	4584606.30
2	Pump_Basin	4821.20	220431.51	4584606.79
3	Treat_Unit	4821.17	220431.68	4584606.63
4	Treat_Unit	4821.06	220420.55	4584606.45
5	Treat_Unit	4821.06	220426.66	4584606.38
6	Ctrl_Panel	4820.97	220428.44	4584608.78
7	Compressor	4822.46	220426.86	4584611.75
8	Valve_Box	4820.31	220460.39	4584616.36
9	Drainfield_Pipe	4821.67	220413.78	4584619.03
10	Drainfield_Pipe	4822.44	220500.72	4584642.11
11	Drainfield_Pipe	4821.47	220480.06	4584625.17
12	Drainfield_Pipe	4821.47	220440.22	4584615.53
13	Effluent_Line	4820.04	220405.60	4584613.36
14	Effluent_Line	4820.17	220400.25	4584617.15
15	Effluent_Line	4822.26	220395.52	4584635.96
16	Effluent_Line	4833.20	220411.40	4584670.60



No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT BO
FINAL SURFACE AS-BUILT
TOPOGRAPHIC SURFACE

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DATE:	12/20/2016
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	SAR
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	1" = 20'

BO.3

EXCAVATION DESCRIPTION FOR LOT BO

A PORTION OF LOT 13, BLOCK 1 OF THE TANGLE WOOD TRACTS SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S19°46'17"E A DISTANCE OF 2991.09 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N28°42'55"E 10.15 FEET
- N16°49'57"E 16.49 FEET
- N07°27'21"E 101.99 FEET
- N25°14'40"W 39.14 FEET
- S54°07'29"W 49.01 FEET

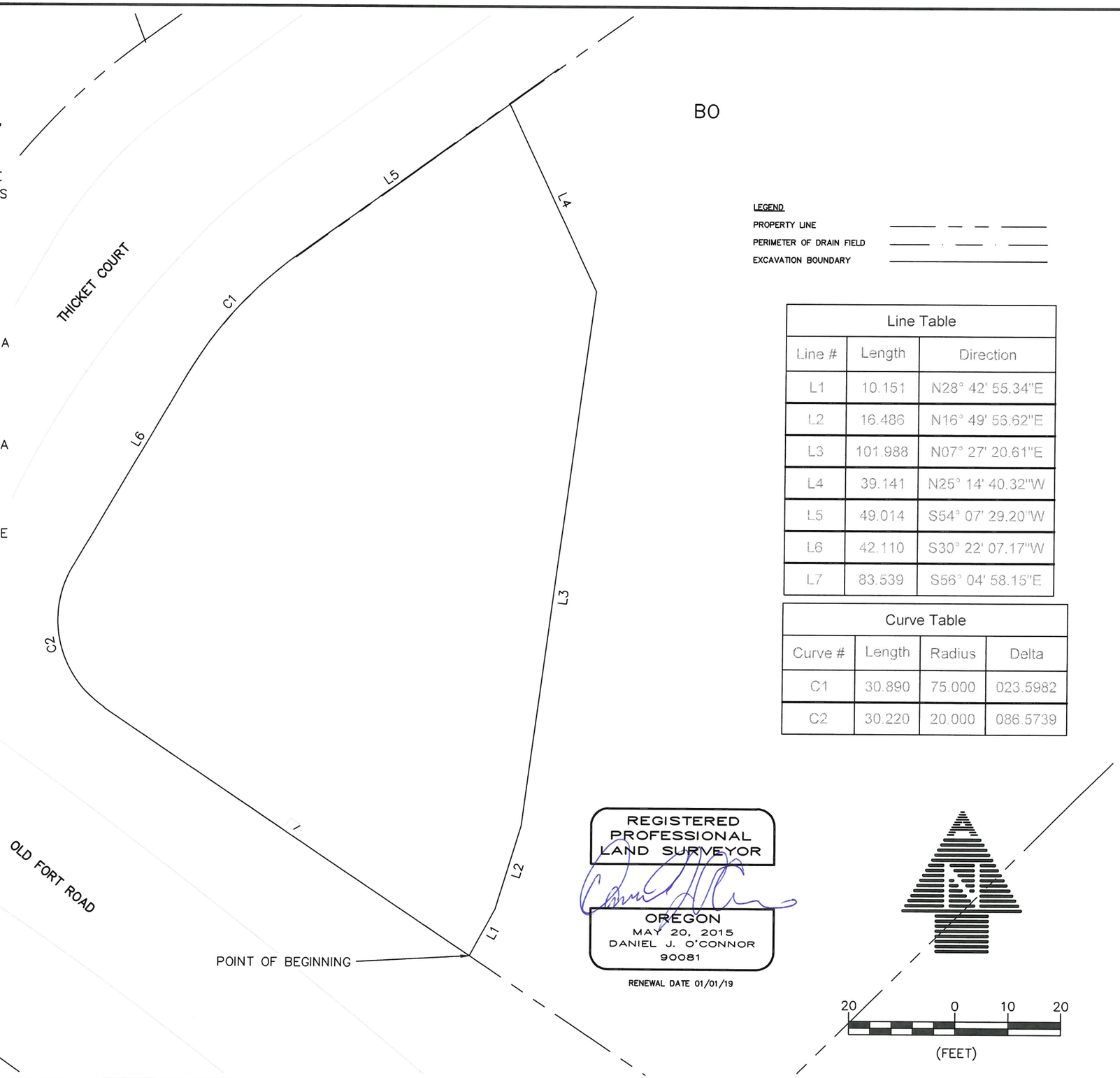
THENCE TO THE BEGINNING OF A CURVE TO THE LEFT, HAVING A RADIUS OF 75 FEET; THENCE ALONG SAID CURVE A DISTANCE OF 30.89 FEET, THROUGH A CENTRAL ANGLE OF 23°35'54", TO THE END OF SAID CURVE; THENCE THE FOLLOWING COURSES:

- S30°22'07"W 42.11 FEET

THENCE TO THE BEGINNING OF A CURVE TO THE LEFT, HAVING A RADIUS OF 20 FEET; THENCE ALONG SAID CURVE A DISTANCE OF 30.22 FEET, THROUGH A CENTRAL ANGLE OF 86°34'26", TO THE END OF SAID CURVE; THENCE THE FOLLOWING COURSES:

- S56°04'58"W 83.54 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N23°47'55"E A DISTANCE OF 2720.19 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.22 ACRES, MORE OR LESS.



LEGEND

PROPERTY LINE

PERIMETER OF DRAIN FIELD

EXCAVATION BOUNDARY

Line Table		
Line #	Length	Direction
L1	10.151	N28° 42' 55.34"E
L2	16.486	N16° 49' 56.62"E
L3	101.988	N07° 27' 20.61"E
L4	39.141	N25° 14' 40.32"W
L5	49.014	S54° 07' 29.20"W
L6	42.110	S30° 22' 07.17"W
L7	83.539	S56° 04' 58.15"E

Curve Table			
Curve #	Length	Radius	Delta
C1	30.890	75.000	023.5982
C2	30.220	20.000	086.5739

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/19

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT BO
AS-BUILT
EXCAVATION DESCRIPTION

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DRAWN BY:	SAR
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	1" = 20'

BO.4

70 0 35 70

(FEET)

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
EXCAVATION BOUNDARY	
STORMWATER DRAINAGE CHANNEL	
TREE	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT BP
FINAL LIFT

TOPOGRAPHIC SURVEY

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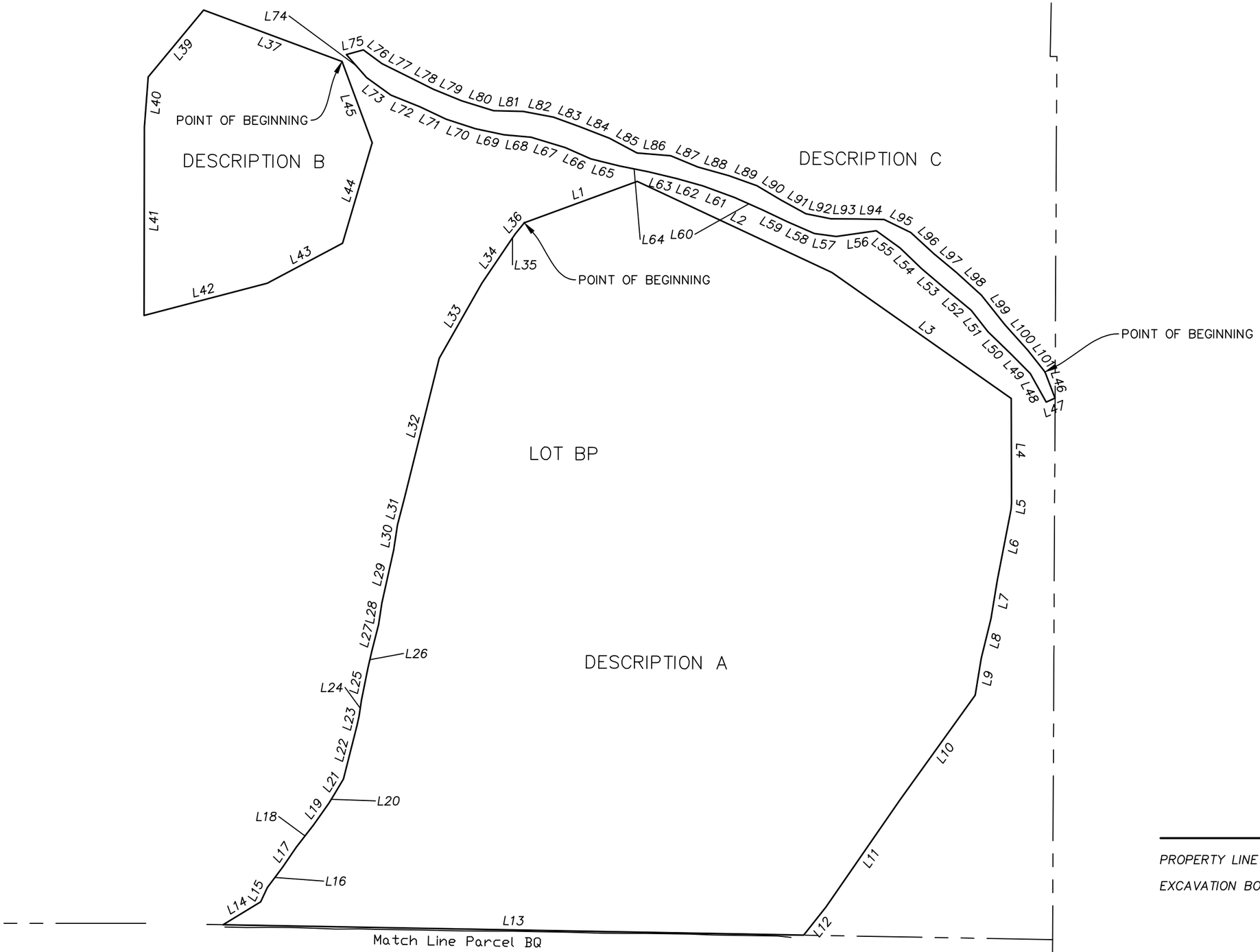
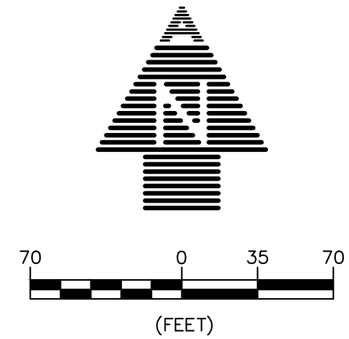
SCALE:	AS SHOWN

BP.3





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MAY 20, 2015
DANIEL J. O'CONNOR
90081

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LEGEND

PROPERTY LINE

EXCAVATION BOUNDARY

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT BP

LEGAL EXHIBIT

TOPOGRAPHIC SURVEY

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CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BP.4

Line Table		
Line #	Length	Direction
L1	81.01′	N69°53′18″E
L2	144.72′	S64°54′35″E
L3	147.58′	S54°56′15″E
L4	70.33′	S00°11′27″E
L5	4.41′	S04°32′58″W
L6	48.41′	S11°02′10″W
L7	26.48′	S09°21′46″W
L8	27.43′	S13°41′14″W
L9	25.10′	S09°25′29″W
L10	86.75′	S35°41′21″W
L11	87.68′	S34°37′41″W
L12	24.25′	S38°19′01″W
L13	391.17′	N88°58′20″W
L14	29.63′	N58°39′13″E
L15	10.65′	N25°22′27″E
L16	17.04′	N36°51′47″E
L17	16.51′	N34°26′34″E
L18	18.99′	N37°38′12″E
L19	17.54′	N35°20′47″E
L20	6.77′	N31°23′50″E

Line Table		
Line #	Length	Direction
L21	12.49′	N31°12′16″E
L22	37.09′	N14°08′25″E
L23	6.50′	N12°46′45″E
L24	10.89′	N08°15′22″E
L25	21.90′	N11°26′09″E
L26	11.95′	N13°13′46″E
L27	18.42′	N14°02′59″E
L28	14.76′	N08°35′44″E
L29	36.46′	N12°35′32″E
L30	17.09′	N08°47′23″E
L31	18.58′	N14°27′21″E
L32	97.15′	N13°59′00″E
L33	58.14′	N29°35′10″E
L34	33.26′	N34°04′01″E
L35	6.87′	N34°18′05″E
L36	9.59′	N39°13′03″E
L37	99.43′	N69°40′06″W
L39	58.47′	S39°42′56″W
L40	33.78′	S04°16′42″W
L41	126.89′	S00°06′31″W

Line Table		
Line #	Length	Direction
L42	85.70′	N75°21′27″E
L43	57.43′	N62°05′42″E
L44	70.64′	N16°24′02″E
L45	58.33′	N20°19′11″W

EXCAVATION DESCRIPTION FOR LOT BP DESCRIPTION A
A PARCEL OF LAND, SITUATE IN THE NE1/4 NE1/4, SECTION 22, T38S, R9E, WILLAMETTE MERIDIAN. BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S19°41′14"E A DISTANCE OF 6589.94 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 10 AND 15 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N69°53′18"E 81.01 FEET
- S64°54′35"E 144.72 FEET
- S54°56′15"E 147.58 FEET
- S00°11′27"E 70.33 FEET
- S04°32′58"W 4.41 FEET
- S11°02′10"W 48.41 FEET
- S09°21′46"W 26.48 FEET
- S13°41′14"W 27.43 FEET
- S09°25′29"W 25.10 FEET
- S35°41′21"W 86.75 FEET
- S34°37′41"W 87.68 FEET
- S38°19′01"W 24.25 FEET
- N88°58′20"W 391.17 FEET
- N58°39′13"E 29.63 FEET
- N25°22′27"E 10.65 FEET
- N36°51′47"E 17.04 FEET
- N34°26′34"E 16.51 FEET
- N37°38′12"E 18.99 FEET
- N35°20′47"E 17.54 FEET
- N31°23′50"E 6.77 FEET
- N31°12′16"E 12.49 FEET
- N14°08′25"E 37.09 FEET
- N12°46′45"E 6.50 FEET
- N08°15′22"E 10.89 FEET
- N11°26′09"E 21.90 FEET
- N13°13′46"E 11.95 FEET
- N14°02′59"E 18.42 FEET
- N08°35′44"E 14.76 FEET
- N12°35′32"E 36.46 FEET
- N08°47′23"E 17.09 FEET
- N14°27′21"E 18.58 FEET
- N13°59′00"E 97.15 FEET
- N29°35′10"E 58.14 FEET
- N34°04′01"E 33.26 FEET
- N34°18′05"E 6.87 FEET
- N39°13′03"E 9.59 FEET

TO THE POINT OF BEGINNING WHICH ALSO BEARS S68°39′23"E DISTANCE OF 2475.73 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 4.08 ACRES, MORE OR LESS.

EXCAVATION DESCRIPTION FOR LOT BP DESCRIPTION B
A PARCEL OF LAND, SITUATE IN THE NE1/4 NE1/4, SECTION 22, T38S, R9E, WILLAMETTE MERIDIAN. BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S18°59′09"E A DISTANCE OF 6446.78 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 10 AND 15 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N69°40′06"W 99.43 FEET
- S39°42′56"W 58.47 FEET
- S04°16′42"W 33.78 FEET
- S00°06′31"W 126.89 FEET
- N75°21′27"E 85.70 FEET
- N62°05′42"E 57.43 FEET
- N16°42′02"E 70.64 FEET
- N20°19′11"W 58.33 FEET

TO THE POINT OF BEGINNING WHICH ALSO BEARS S70°03′04"E DISTANCE OF 2322.58 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.54 ACRES, MORE OR LESS.

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BP
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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DATE:	2/21/2018
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BP.5

Line Table		
Line #	Length	Direction
L46	18.85′	S21°05′59″E
L47	6.59′	S66°09′59″W
L48	22.00′	N29°04′00″W
L49	18.75′	N44°38′36″W
L50	21.23′	N45°54′23″W
L51	18.39′	N38°20′05″W
L52	21.28′	N50°10′18″W
L53	22.27′	N49°42′25″W
L54	20.23′	N46°03′34″W
L55	19.66′	N54°06′44″W
L56	27.29′	S81°44′44″W
L57	14.82′	N82°16′10″W
L58	19.91′	N66°18′22″W
L59	18.14′	N64°46′16″W
L60	20.95′	N65°58′14″W
L61	22.71′	N69°54′44″W
L62	18.23′	N74°26′16″W
L63	19.45′	N76°23′09″W
L64	20.09′	N78°23′29″W
L65	19.93′	N76°09′10″W

Line Table		
Line #	Length	Direction
L66	18.82′	N66°10′56″W
L67	24.08′	N73°19′41″W
L68	18.19′	N84°49′31″W
L69	19.72′	N77°51′03″W
L70	20.70′	N72°08′25″W
L71	19.34′	N64°40′30″W
L72	21.35′	N68°02′21″W
L73	20.07′	N54°08′51″W
L74	20.72′	N41°22′09″W
L75	11.91′	N74°35′56″E
L76	15.51′	S53°27′32″E
L77	21.47′	S63°33′11″E
L78	17.22′	S63°12′21″E
L79	20.75′	S67°55′33″E
L80	22.42′	S72°43′00″E
L81	19.84′	S88°45′28″E
L82	20.74′	S79°17′51″E
L83	19.13′	S70°08′40″E
L84	21.33′	S68°34′51″E
L85	20.97′	S61°52′07″E

Line Table		
Line #	Length	Direction
L86	22.76′	S85°17′56″E
L87	19.77′	S67°28′41″E
L88	21.69′	S74°31′30″E
L89	20.16′	S70°20′57″E
L90	18.42′	S59°02′37″E
L91	19.63′	S61°13′04″E
L92	17.26′	S78°46′31″E
L93	17.75′	S89°26′18″E
L94	17.93′	S89°02′05″E
L95	19.99′	S63°59′10″E
L96	21.18′	S47°33′59″E
L97	19.76′	S50°19′45″E
L98	22.73′	S47°32′01″E
L99	25.45′	S38°24′58″E
L100	23.04′	S41°52′57″E
L101	18.64′	S38°32′30″E

EXCAVATION DESCRIPTION FOR LOT BP DESCRIPTION C

A PARCEL OF LAND, SITUATE IN THE NE1/4 NE1/4, SECTION 22, T38S, R9E, WILLAMETTE MERIDIAN. BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S22°07′24″E A DISTANCE OF 6828.15 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 10 AND 15 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S21°05′59″E 18.85 FEET
- S66°09′59″W 6.59 FEET
- N29°04′00″W 22.00 FEET
- N44°38′36″W 18.75 FEET
- N45°54′23″W 21.23 FEET
- N38°20′05″W 18.39 FEET
- N50°10′18″W 21.28 FEET
- N49°42′25″W 22.27 FEET
- N46°03′34″W 20.23 FEET
- N54°06′44″W 19.66 FEET
- S81°44′44″W 27.29 FEET
- N82°16′10″W 14.82 FEET
- N66°18′22″W 19.91 FEET
- N64°46′16″W 18.14 FEET
- N65°58′14″W 20.95 FEET
- N69°54′44″W 22.71 FEET
- N74°26′16″W 18.23 FEET
- N76°23′09″W 19.45 FEET
- N78°23′09″W 20.09 FEET
- N76°09′10″W 19.93 FEET
- N66°10′56″W 18.82 FEET
- N73°19′41″W 24.08 FEET
- N84°49′31″W 18.19 FEET
- N77°51′03″W 19.72 FEET
- N72°08′25″W 20.70 FEET
- N64°40′30″W 19.34 FEET
- N68°02′21″W 21.35 FEET
- N54°08′51″W 20.07 FEET
- N41°22′09″W 20.72 FEET
- N74°35′56″E 11.91 FEET
- S53°27′32″E 15.51 FEET
- S63°33′11″E 21.47 FEET
- S63°12′21″E 17.22 FEET
- S67°55′33″E 20.75 FEET
- S72°43′00″E 22.42 FEET
- S88°45′28″E 19.84 FEET
- S79°17′51″E 20.74 FEET
- S70°08′40″E 19.13 FEET
- S68°34′51″E 21.33 FEET
- S61°52′07″E 20.97 FEET
- S85°17′56″E 22.76 FEET
- S67°28′41″E 19.77 FEET
- S74°31′30″E 21.69 FEET
- S70°20′57″E 20.16 FEET
- S59°02′37″E 18.42 FEET
- S61°13′04″E 19.63 FEET
- S78°46′31″E 17.26 FEET
- S89°26′18″E 17.75 FEET
- S89°02′05″E 17.93 FEET
- S63°59′10″E 19.99 FEET
- S47°33′59″E 21.18 FEET
- S50°19′45″E 19.76 FEET
- S47°32′01″E 22.73 FEET
- S38°24′58″E 25.45 FEET
- S41°52′57″E 23.04 FEET
- S38°32′30″E 18.64 FEET

TO THE POINT OF BEGINNING WHICH ALSO BEARS S68°58′05″E DISTANCE OF 2847.04 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.16 ACRES, MORE OR LESS.

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT BP

LEGAL DESCRIPTION

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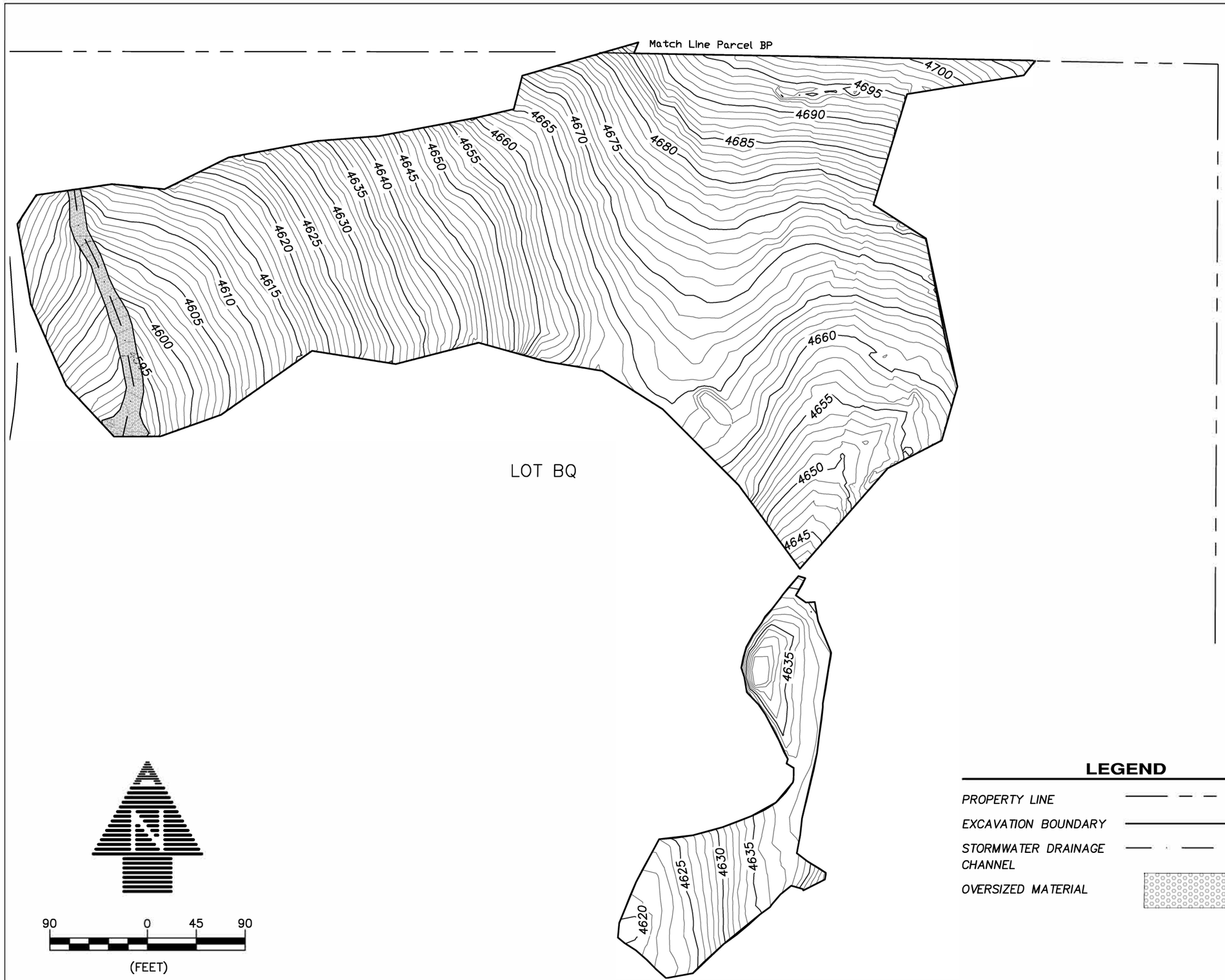
BP.6



REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
EXCAVATION BOUNDARY	
STORMWATER DRAINAGE CHANNEL	
OVERSIZED MATERIAL	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BQ
FINAL LIFT
TOPOGRAPHIC SURVEY

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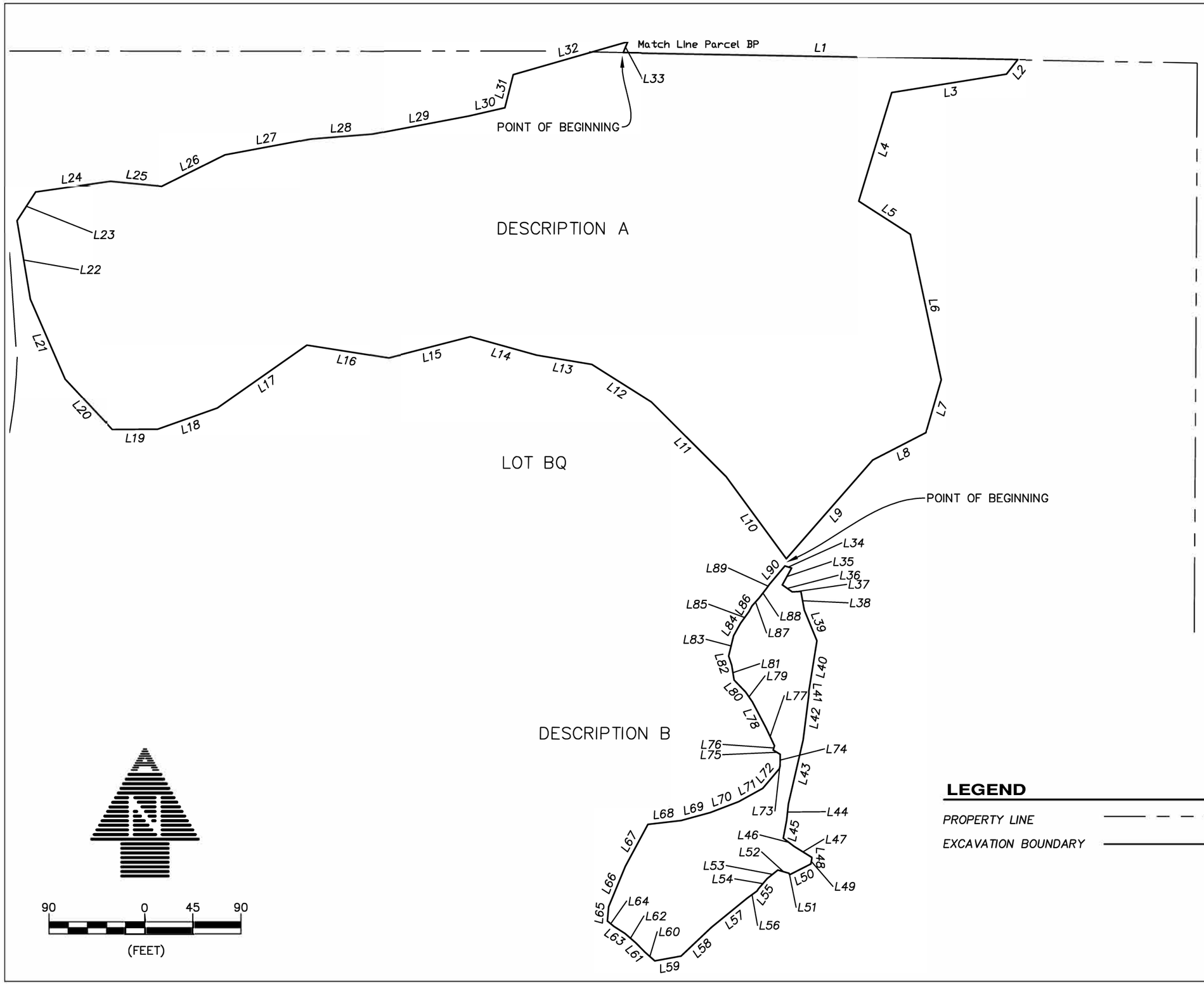
BQ.3



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PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE

EXCAVATION BOUNDARY

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT BQ

LEGAL EXHIBIT

TOPOGRAPHIC SURVEY

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SCALE:	AS SHOWN

BQ.3

Line Table		
Line #	Length	Direction
L1	369.60	S88°58'25"E
L2	17.20	S37°52'25"W
L3	108.85	S80°50'48"W
L4	106.33	S16°53'56"W
L5	57.37	S57°14'31"E
L6	139.13	S12°02'22"E
L7	51.65	S16°12'45"W
L8	55.92	S62°46'53"W
L9	122.87	S41°11'21"W
L10	95.45	N36°15'22"W
L11	98.84	N45°03'00"W
L12	65.91	N57°45'21"W
L13	52.36	N80°28'58"W
L14	64.35	N74°26'20"W
L15	78.80	S75°34'22"W
L16	77.99	N81°02'36"W
L17	102.37	S54°55'06"W
L18	59.17	S70°28'51"W
L19	42.69	S89°39'43"W
L20	64.48	N43°05'20"W

Line Table		
Line #	Length	Direction
L21	81.50	N23°34'52"W
L22	74.60	N09°33'54"W
L23	31.93	N32°59'48"E
L24	70.84	N81°47'27"E
L25	48.11	S84°18'36"E
L26	66.02	N63°43'20"E
L27	82.10	N79°22'51"E
L28	57.91	N85°31'06"E
L29	92.14	N79°16'05"E
L30	34.34	N77°06'17"E
L31	31.68	N14°19'13"E
L32	111.24	N73°59'12"E
L33	10.91	S22°20'30"W
L34	6.54	S73°10'03"E
L35	17.94	S28°33'52"W
L36	11.37	S54°55'35"E
L37	8.08	N87°02'36"E
L38	17.76	S10°19'48"E
L39	31.13	S22°20'31"E
L40	47.39	S09°13'35"W

Line Table		
Line #	Length	Direction
L41	3.17	S00°59'37"E
L42	43.12	S07°08'20"W
L43	61.44	S12°58'40"W
L44	15.41	S06°34'44"W
L45	17.14	S10°31'47"W
L46	12.60	S52°42'48"E
L47	19.63	S58°11'18"E
L48	1.31	S00°59'37"E
L49	4.96	S09°59'19"W
L50	22.25	S63°21'08"W
L51	1.45	N25°01'45"W
L52	10.88	N74°07'06"W
L53	12.69	S51°19'34"W
L54	12.56	S40°21'09"W
L55	2.56	S34°04'50"W
L56	11.52	S53°56'06"W
L57	43.15	S50°43'39"W
L58	39.11	S46°38'24"W
L59	24.89	S79°35'35"W
L60	12.56	N48°08'28"W

Line Table		
Line #	Length	Direction
L61	11.97	N44°46'12"W
L62	13.46	N49°19'08"W
L63	12.23	N56°49'46"W
L64	8.00	N51°08'49"W
L65	13.48	N05°22'18"E
L66	40.89	N22°16'01"E
L67	44.61	N28°24'53"E
L68	31.17	N83°21'14"E
L69	28.44	N74°53'22"E
L70	28.55	N68°56'47"E
L71	25.69	N61°09'23"E
L72	24.19	N39°48'23"E
L73	2.63	N14°04'24"E
L74	10.65	N00°43'34"E
L75	7.80	N58°09'57"W
L76	4.18	N16°39'45"E
L77	18.56	N25°10'54"W
L78	27.54	N27°37'09"W
L79	11.09	N34°47'09"W
L80	15.53	N43°41'05"W

Line Table		
Line #	Length	Direction
L81	14.13	N09°11'18"W
L82	9.03	N18°53'11"W
L83	19.58	N13°41'03"E
L84	13.23	N29°18'08"E
L85	13.30	N35°51'57"E
L86	6.41	N28°49'35"E
L87	9.88	N41°57'24"E
L88	11.75	N37°11'27"E
L89	4.35	N35°46'42"E
L90	22.34	N40°15'13"E

90 0 45 90

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

EXCAVATION DESCRIPTION FOR LOT BQ DESCRIPTION A

A PARCEL OF LAND, SITUATE IN THE NE1/4 SE1/4, SECTION 22, T38S, R9E, WILLAMETTE MERIDIAN. BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S16°58'09"E A DISTANCE OF 6981.76 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 10 AND 15 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S88°58'25"E 369.60 FEET
- S37°52'25"W 17.20 FEET
- S80°50'48"W 108.85 FEET
- S16°53'56"W 106.33 FEET
- S57°14'31"E 57.37 FEET
- S12°02'22"E 139.13 FEET
- S16°12'45"W 51.65 FEET
- S62°46'53"W 55.92 FEET
- S41°11'21"W 122.87 FEET
- N36°15'22"W 95.45 FEET
- N45°03'00"W 98.84 FEET
- N57°45'21"W 65.91 FEET
- N80°28'58"W 52.36 FEET
- N74°26'20"W 64.35 FEET
- S75°34'22"W 78.80 FEET
- N81°02'36"W 77.99 FEET
- S54°55'06"W 102.37 FEET
- S70°28'51"W 59.17 FEET
- S89°39'43"W 42.69 FEET
- N43°05'20"W 64.48 FEET
- N23°34'52"W 81.50 FEET
- N09°33'54"W 74.60 FEET
- N32°59'48"E 31.93 FEET
- N81°47'27"E 70.84 FEET
- S84°18'36"E 48.11 FEET
- N63°43'20"E 66.02 FEET
- N79°22'51"E 82.10 FEET
- N85°31'06"E 57.91 FEET
- N79°16'05"E 92.14 FEET
- N77°06'17"E 34.34 FEET
- N14°19'13"E 31.68 FEET
- N73°59'12"E 111.24 FEET
- S22°20'30"W 10.91 FEET

TO THE POINT OF BEGINNING WHICH ALSO BEARS S57°05'36"E DISTANCE OF 2529.36 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 5.30 ACRES, MORE OR LESS.

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BQ
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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SURVEYED BY:	DNN
SCALE:	AS SHOWN

BQ.5

EXCAVATION DESCRIPTION FOR LOT BQ DESCRIPTION B

A PARCEL OF LAND, SITUATE IN THE NE1/4 SE1/4, SECTION 22, T38S, R9E, WILLAMETTE MERIDIAN. BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S17°00'14"E A DISTANCE OF 7485.81 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 10 AND 15 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S73°10'03"E 6.54 FEET
- S28°33'52"W 17.94 FEET
- S54°55'35"E 11.37 FEET
- N87°02'36"E 8.08 FEET
- S10°19'48"E 17.76 FEET
- S22°20'31"E 31.13 FEET
- S09°13'35"W 47.39 FEET
- S00°59'37"E 3.17 FEET
- S07°08'20"W 43.12 FEET
- S12°58'40"W 61.44 FEET
- S06°34'44"W 15.41 FEET
- S10°31'47"W 17.14 FEET
- S52°42'48"E 12.60 FEET
- S58°11'18"E 19.63 FEET
- S00°59'37"E 1.31 FEET
- S09°59'19"W 4.96 FEET
- S63°21'08"W 22.25 FEET
- N25°01'45"W 1.45 FEET
- N74°07'06"W 10.88 FEET
- S51°19'34"W 12.69 FEET
- S40°21'09"W 12.56 FEET
- S34°04'50"W 2.56 FEET
- S53°56'06"W 11.52 FEET
- S50°43'39"W 43.15 FEET
- S46°38'24"W 39.11 FEET
- S79°35'35"W 24.89 FEET
- N48°08'28"W 12.56 FEET
- N44°46'12"W 11.97 FEET
- N49°19'08"W 13.46 FEET
- N56°49'46"W 12.23 FEET
- N51°08'49"W 8.00 FEET
- N05°22'18"E 13.48 FEET
- N22°16'01"E 40.89 FEET
- N28°24'53"E 44.61 FEET
- N83°21'14"E 31.17 FEET
- N74°53'22"E 28.44 FEET
- N68°56'47"E 28.55 FEET
- N61°09'23"E 25.69 FEET
- N39°48'23"E 24.19 FEET
- N14°04'24"E 2.63 FEET
- N00°43'34"E 10.65 FEET
- N58°09'57"W 7.80 FEET
- N16°39'45"E 4.18 FEET
- N25°10'54"W 18.56 FEET
- N27°37'09"W 27.54 FEET
- N34°47'09"W 11.09 FEET
- N43°41'05"W 15.53 FEET
- N09°11'18"W 14.13 FEET
- N18°53'11"W 9.03 FEET
- N13°41'03"E 19.58 FEET
- N29°18'08"E 13.23 FEET
- N35°51'57"E 13.30 FEET
- N28°49'35"E 6.41 FEET
- N41°57'24"E 9.88 FEET
- N37°11'27"E 11.75 FEET
- N35°46'42"E 4.35 FEET
- N40°15'13"E 22.34 FEET

TO THE POINT OF BEGINNING WHICH ALSO BEARS S50°48'28"E DISTANCE OF 2935.35 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.60 ACRES, MORE OR LESS.

90 0 45 90

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT BQ

LEGAL DESCRIPTION

TOPOGRAPHIC SURVEY

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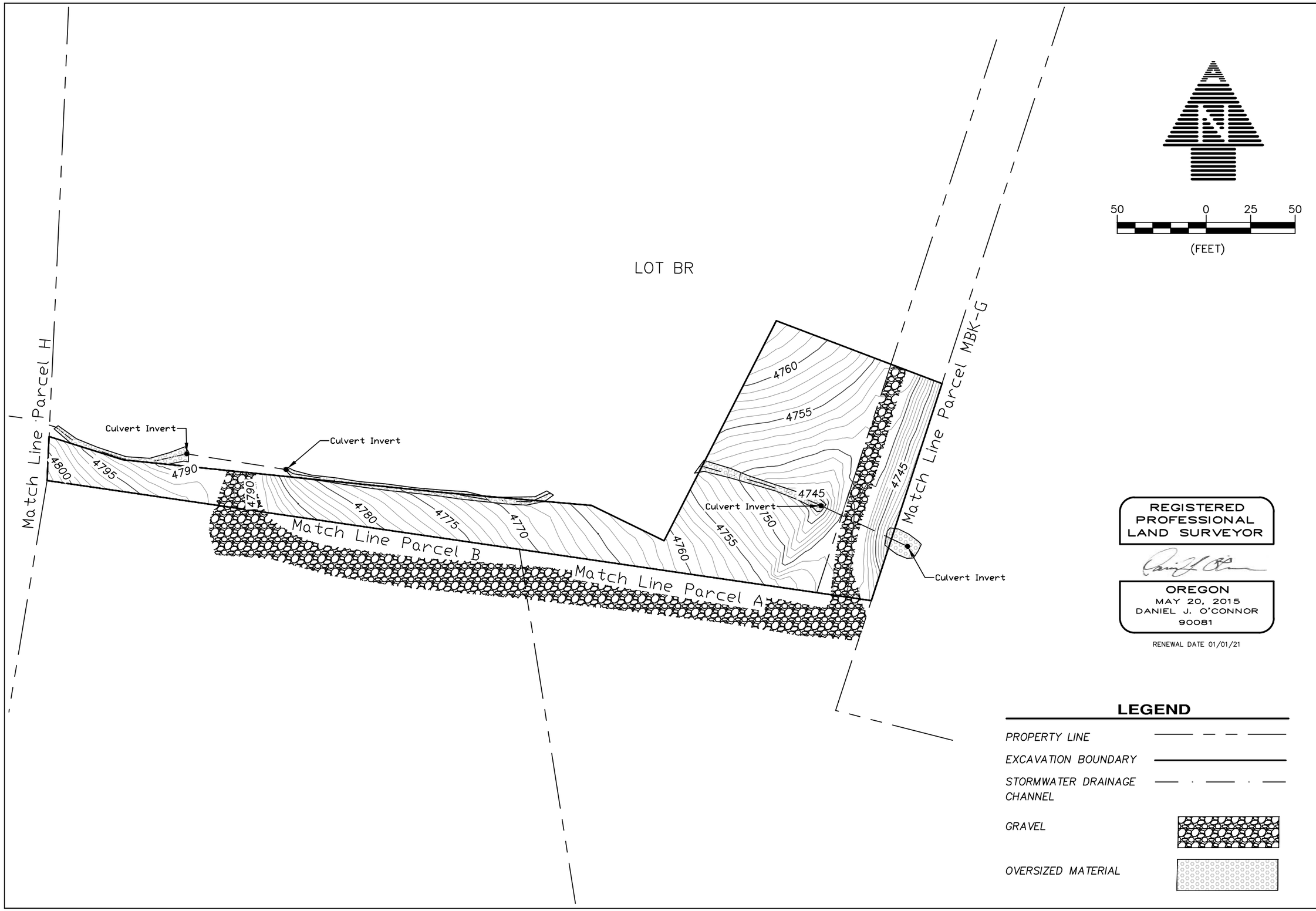
BQ.6



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OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
EXCAVATION BOUNDARY	
STORMWATER DRAINAGE CHANNEL	
GRAVEL	
OVERSIZED MATERIAL	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT BR
FINAL LIFT
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SURVEYED BY:	DNN
SCALE:	AS SHOWN

BR.3

Line Table		
Line #	Length	Direction
L1	68.92	N69° 14′ 25″W
L2	138.82	S27° 02′ 29″W
L3	45.35	N64° 00′ 39″W
L4	84.47	N85° 01′ 49″W
L5	180.20	N84° 10′ 25″W
L6	43.54	N72° 27′ 15″W
L7	24.76	S02° 36′ 17″W
L8	437.19	S81° 42′ 32″E
L9	135.01	N18° 01′ 18″E

EXCAVATION DESCRIPTION A FOR LOT BR

A PORTION OF PARCEL 1 OF LAND PARTITION 44–93 AS RECORDED IN THE RECORDS OF KLAMATH COUNTY, OREGON. SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S04°44'42"W A DISTANCE OF 1755.45 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 10 AND 15 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N69°14'25"W 68.92 FEET
- S27°02'29"W 138.82 FEET
- N64°00'39"W 45.35 FEET
- N85°01'49"W 84.47 FEET
- N84°10'25"W 180.20 FEET
- N72°27'15"W 43.54 FEET
- S02°36'17"W 24.76 FEET
- S81°42'32"E 437.19 FEET
- N18°01'18"E 135.01 FEET

TO THE POINT OF BEGINNING WHICH ALSO BEARS N00°57'23"W A DISTANCE OF 3554.72 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.45 ACRES, MORE OR LESS.

Line Table		
Line #	Length	Direction
L22	30.65	N69° 14′ 25″W
L23	135.01	S18° 01′ 18″W
L24	31.06	S81° 42′ 32″E
L25	128.29	N18° 01′ 18″E

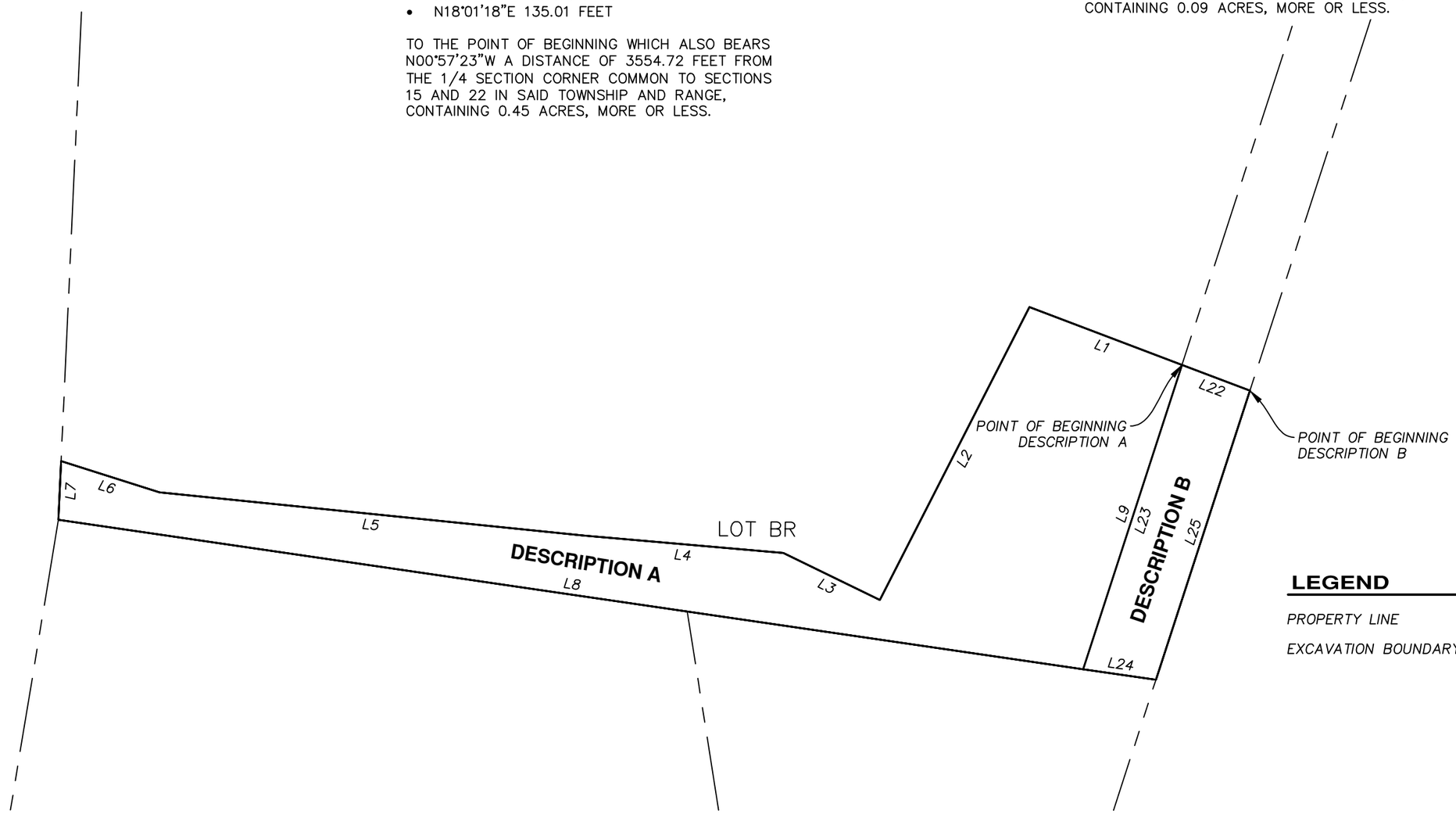
EXCAVATION DESCRIPTION B FOR LOT BR

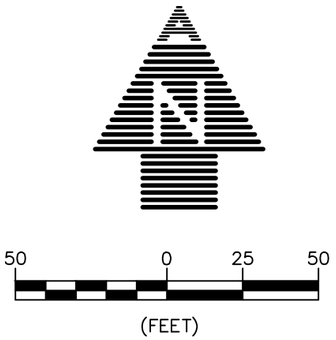
A PORTION OF PARCEL 1 OF LAND PARTITION 44–93 AS RECORDED IN THE RECORDS OF KLAMATH COUNTY, OREGON. SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S03°47'17"W A DISTANCE OF 1764.15 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 10 AND 15 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N69°14'25"W 30.65 FEET
- S18°01'18"W 135.01 FEET
- S81°42'32"E 31.06 FEET
- N18°01'18"E 128.29 FEET

TO THE POINT OF BEGINNING WHICH ALSO BEARS N00°29'46"W A DISTANCE OF 3543.49 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 0.09 ACRES, MORE OR LESS.





REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE

EXCAVATION BOUNDARY

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT BR

LEGAL DESCRIPTION

TOPOGRAPHIC SURVEY

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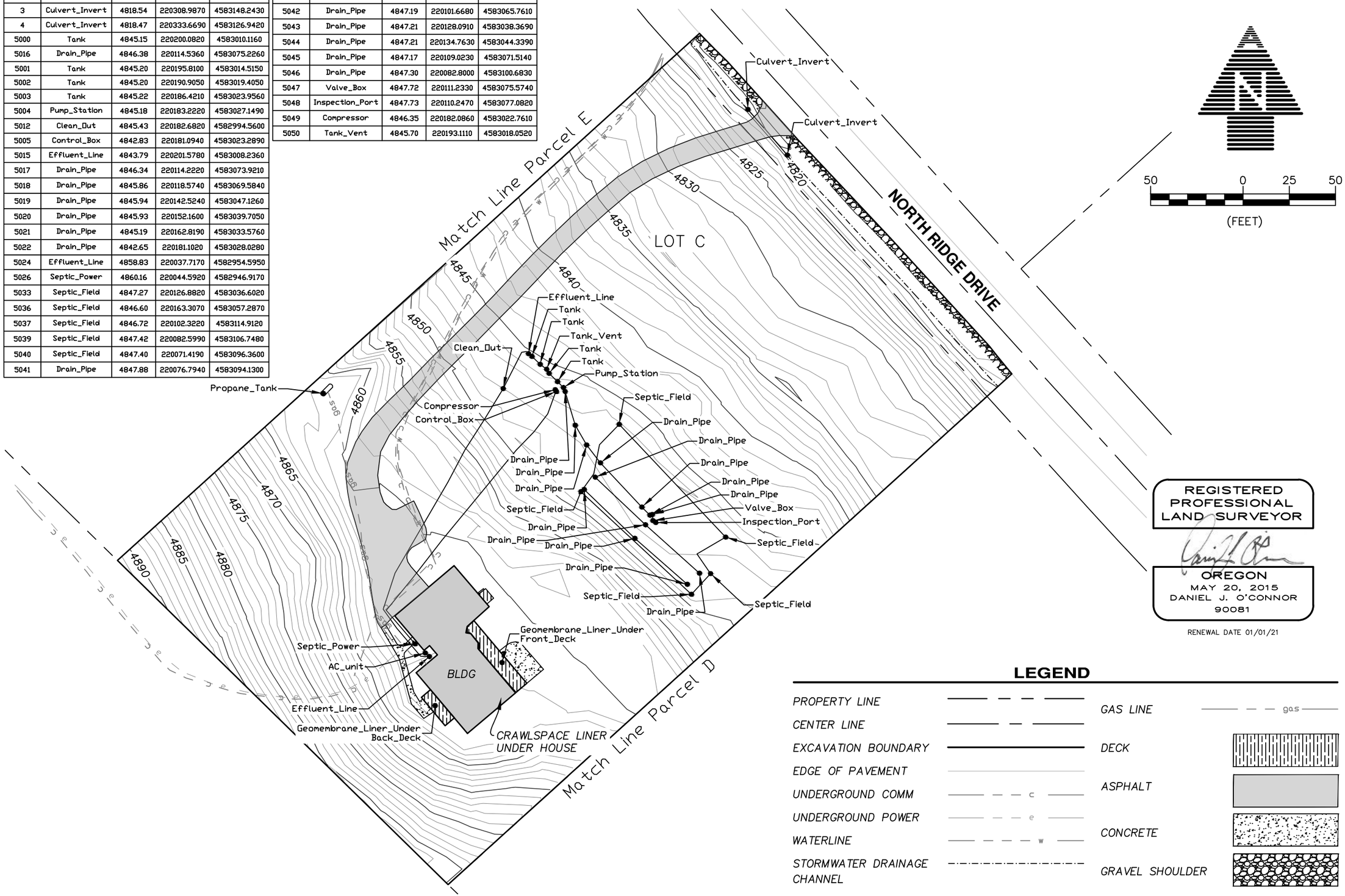
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

BR.4

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
3	Culvert_Invert	4818.54	220308.9870	4583148.2430
4	Culvert_Invert	4818.47	220333.6690	4583126.9420
5000	Tank	4845.15	220200.0820	4583010.1160
5016	Drain_Pipe	4846.38	220114.5360	4583075.2260
5001	Tank	4845.20	220195.8100	4583014.5150
5002	Tank	4845.20	220190.9050	4583019.4050
5003	Tank	4845.22	220186.4210	4583023.9560
5004	Pump_Station	4845.18	220183.2220	4583027.1490
5012	Clean_Out	4845.43	220182.6820	4582994.5600
5005	Control_Box	4842.83	220181.0940	4583023.2890
5015	Effluent_Line	4843.79	220201.5780	4583008.2360
5017	Drain_Pipe	4846.34	220114.2220	4583073.9210
5018	Drain_Pipe	4845.86	220118.5740	4583069.5840
5019	Drain_Pipe	4845.94	220142.5240	4583047.1260
5020	Drain_Pipe	4845.93	220152.1600	4583039.7050
5021	Drain_Pipe	4845.19	220162.8190	4583033.5760
5022	Drain_Pipe	4842.65	220181.1020	4583028.0280
5024	Effluent_Line	4858.83	220037.7170	4582954.5950
5026	Septic_Power	4860.16	220044.5920	4582946.9170
5033	Septic_Field	4847.27	220126.8820	4583036.6020
5036	Septic_Field	4846.60	220163.3070	4583057.2870
5037	Septic_Field	4846.72	220102.3220	4583114.9120
5039	Septic_Field	4847.42	220082.5990	4583106.7480
5040	Septic_Field	4847.40	220071.4190	4583096.3600
5041	Drain_Pipe	4847.88	220076.7940	4583094.1300

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
5042	Drain_Pipe	4847.19	220101.6680	4583065.7610
5043	Drain_Pipe	4847.21	220128.0910	4583038.3690
5044	Drain_Pipe	4847.21	220134.7630	4583044.3390
5045	Drain_Pipe	4847.17	220109.0230	4583071.5140
5046	Drain_Pipe	4847.30	220082.8000	4583100.6830
5047	Valve_Box	4847.72	220111.2330	4583075.5740
5048	Inspection_Port	4847.73	220110.2470	4583077.0820
5049	Compressor	4846.35	220182.0860	4583022.7610
5050	Tank_Vent	4845.70	220193.1110	4583018.0520



REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	GAS LINE
CENTER LINE	DECK
EXCAVATION BOUNDARY	ASPHALT
EDGE OF PAVEMENT	CONCRETE
UNDERGROUND COMM	GRAVEL SHOULDER
UNDERGROUND POWER	
WATERLINE	
STORMWATER DRAINAGE CHANNEL	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT C
FINAL LIFT
TOPOGRAPHIC SURVEY

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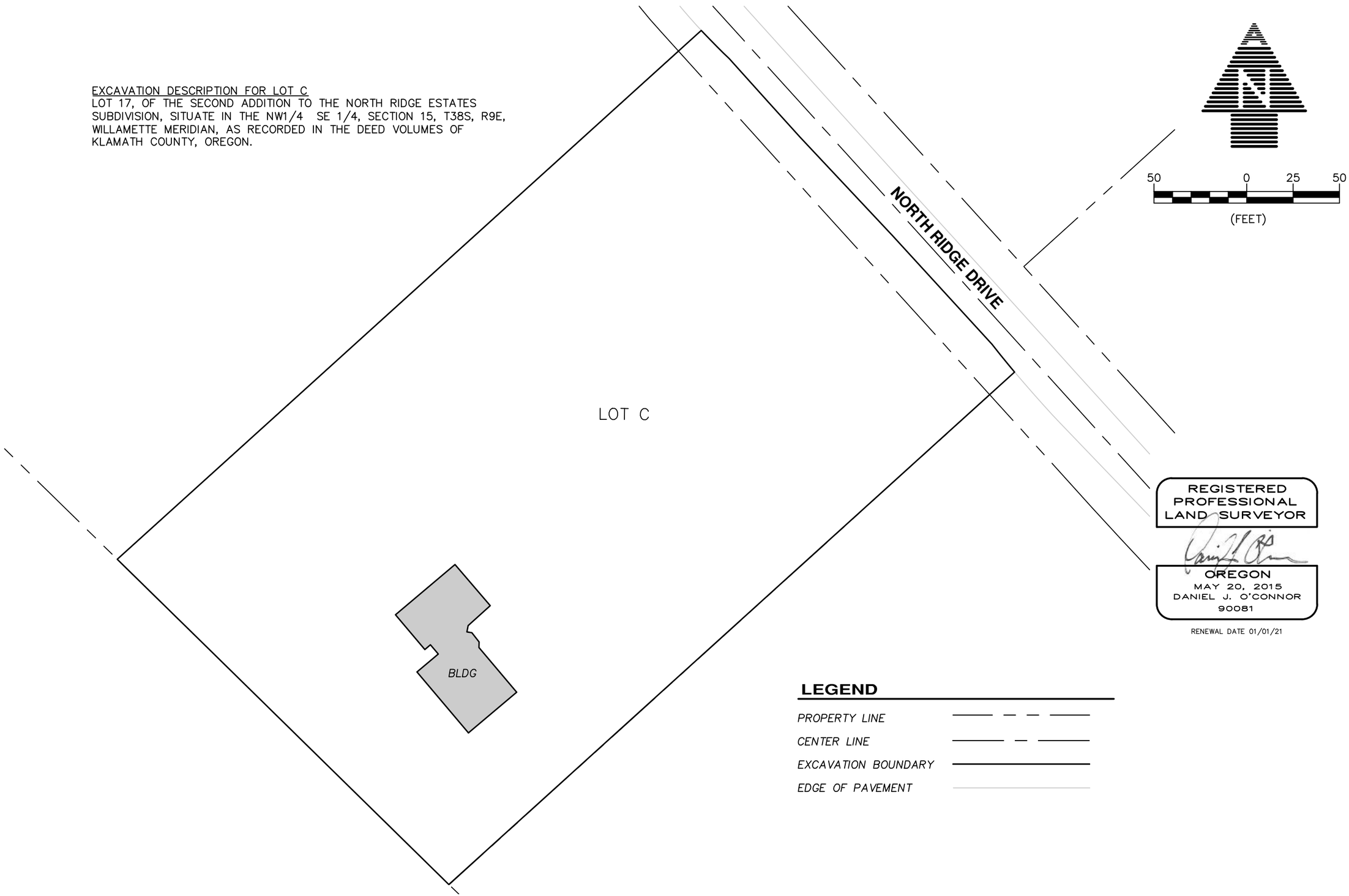
SURVEYED BY:	DNN
SCALE:	AS SHOWN

C.3

EXCAVATION DESCRIPTION FOR LOT C
LOT 17, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW1/4 SE 1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



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OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081
RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT C
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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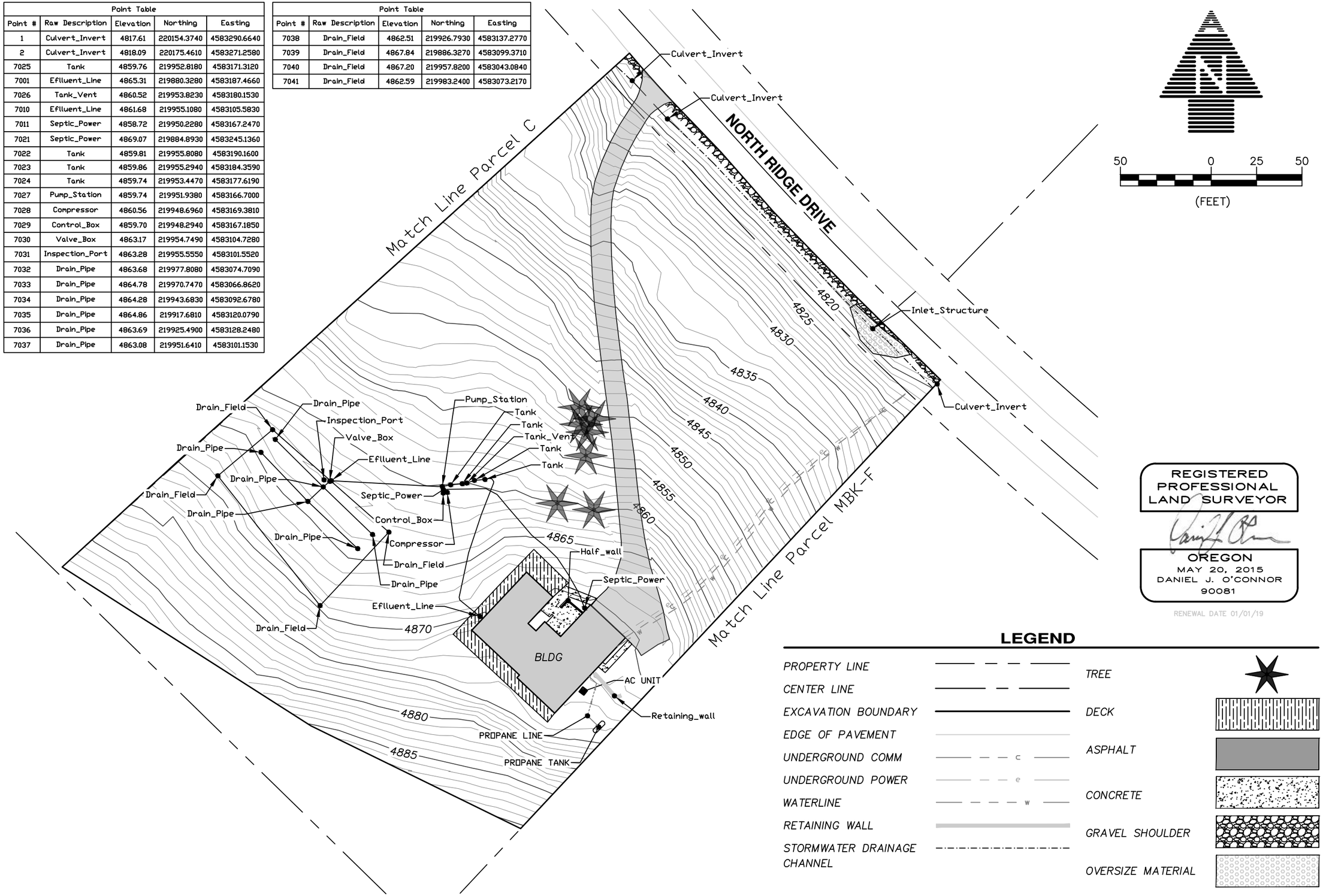
SURVEYED BY:	DNN
SCALE:	AS SHOWN

C.4

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
1	Culvert_Invert	4817.61	220154.3740	4583290.6640
2	Culvert_Invert	4818.09	220175.4610	4583271.2580
7025	Tank	4859.76	219952.8180	4583171.3120
7001	Effluent_Line	4865.31	219880.3280	4583187.4660
7026	Tank_Vent	4860.52	219953.8230	4583180.1530
7010	Effluent_Line	4861.68	219955.1080	4583105.5830
7011	Septic_Power	4858.72	219950.2280	4583167.2470
7021	Septic_Power	4869.07	219884.8930	4583245.1360
7022	Tank	4859.81	219955.8080	4583190.1600
7023	Tank	4859.86	219955.2940	4583184.3590
7024	Tank	4859.74	219953.4470	4583177.6190
7027	Pump_Station	4859.74	219951.9380	4583166.7000
7028	Compressor	4860.56	219948.6960	4583169.3810
7029	Control_Box	4859.70	219948.2940	4583167.1850
7030	Valve_Box	4863.17	219954.7490	4583104.7280
7031	Inspection_Port	4863.28	219955.5550	4583101.5520
7032	Drain_Pipe	4863.68	219977.8080	4583074.7090
7033	Drain_Pipe	4864.78	219970.7470	4583066.8620
7034	Drain_Pipe	4864.28	219943.6830	4583092.6780
7035	Drain_Pipe	4864.86	219917.6810	4583120.0790
7036	Drain_Pipe	4863.69	219925.4900	4583128.2480
7037	Drain_Pipe	4863.08	219951.6410	4583101.1530

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
7038	Drain_Field	4862.51	219926.7930	4583137.2770
7039	Drain_Field	4867.84	219886.3270	4583099.3710
7040	Drain_Field	4867.20	219957.8200	4583043.0840
7041	Drain_Field	4862.59	219983.2400	4583073.2170



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OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/19

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM
UNDERGROUND POWER
WATERLINE
RETAINING WALL
STORMWATER DRAINAGE CHANNEL

TREE
DECK
ASPHALT
CONCRETE
GRAVEL SHOULDER
OVERSIZE MATERIAL

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT D
FINAL LIFT
TOPOGRAPHIC SURVEY

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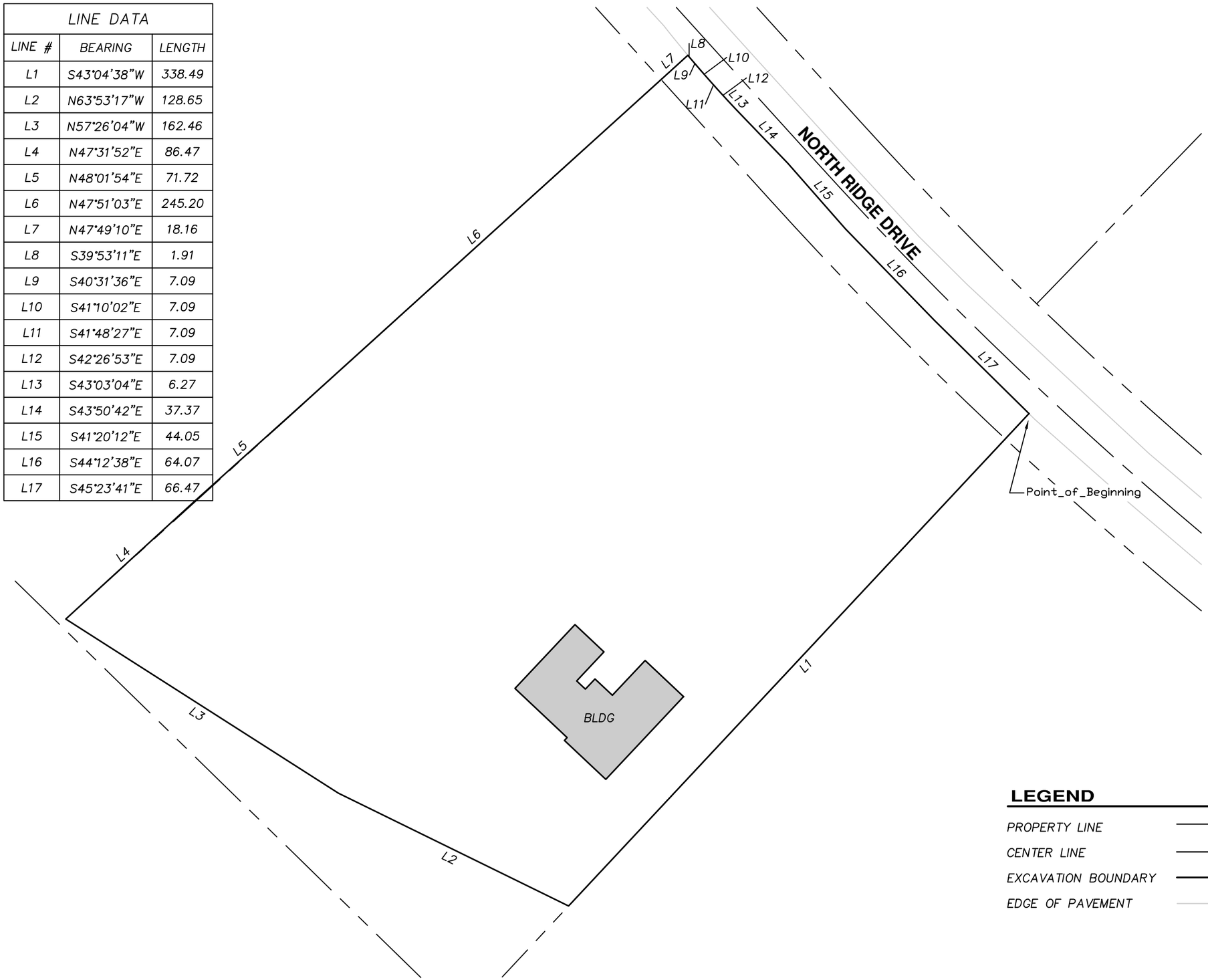
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

D.3

LINE DATA		
LINE #	BEARING	LENGTH
L1	S43°04'38"W	338.49
L2	N63°53'17"W	128.65
L3	N57°26'04"W	162.46
L4	N47°31'52"E	86.47
L5	N48°01'54"E	71.72
L6	N47°51'03"E	245.20
L7	N47°49'10"E	18.16
L8	S39°53'11"E	1.91
L9	S40°31'36"E	7.09
L10	S41°10'02"E	7.09
L11	S41°48'27"E	7.09
L12	S42°26'53"E	7.09
L13	S43°03'04"E	6.27
L14	S43°50'42"E	37.37
L15	S41°20'12"E	44.05
L16	S44°12'38"E	64.07
L17	S45°23'41"E	66.47



50 0 25 50
(FEET)

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OREGON
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DANIEL J. O'CONNOR
90081
RENEWAL DATE 01/01/19

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT D
LEGAL DESCRIPTION
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SURVEYED BY:	DNN
SCALE:	AS SHOWN

D.4

EXCAVATION DESCRIPTION FOR LOT D

A PORTION OF LOT 18, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW1/4 SE1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S03°54'26"W A DISTANCE OF 3176.90 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S43°04'38"W 338.49 FEET
- N63°53'17"W 128.65 FEET
- N57°26'04"W 162.46 FEET
- N47°31'52"E 86.47 FEET
- N48°01'54"E 71.72 FEET
- N47°51'03"E 245.20 FEET
- N47°49'10"E 18.16 FEET
- S39°53'11"E 1.91 FEET
- S40°31'36"E 7.09 FEET
- S41°10'02"E 7.09 FEET
- S41°48'27"E 7.09 FEET
- S42°26'53"E 7.09 FEET
- S43°03'04"E 6.27 FEET
- S43°50'42"E 37.37 FEET
- S41°20'12"E 44.05 FEET
- S44°12'38"E 64.07 FEET
- S45°23'41"E 66.47 FEET

TO THE BEGINNING OF AN 2029.64 FOOT RADIUS CURVE TO THE LEFT; THENCE ALONG SAID CURVE A DISTANCE OF 167.72 FEET, THE CHORD OF WHICH BEARS S44°32'56"E; 167.67 FEET.

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N03°30'07"W A DISTANCE OF 2138.13 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 2.32 ACRES, MORE OR LESS.

50 0 25 50

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/19

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT D

LEGAL DESCRIPTION

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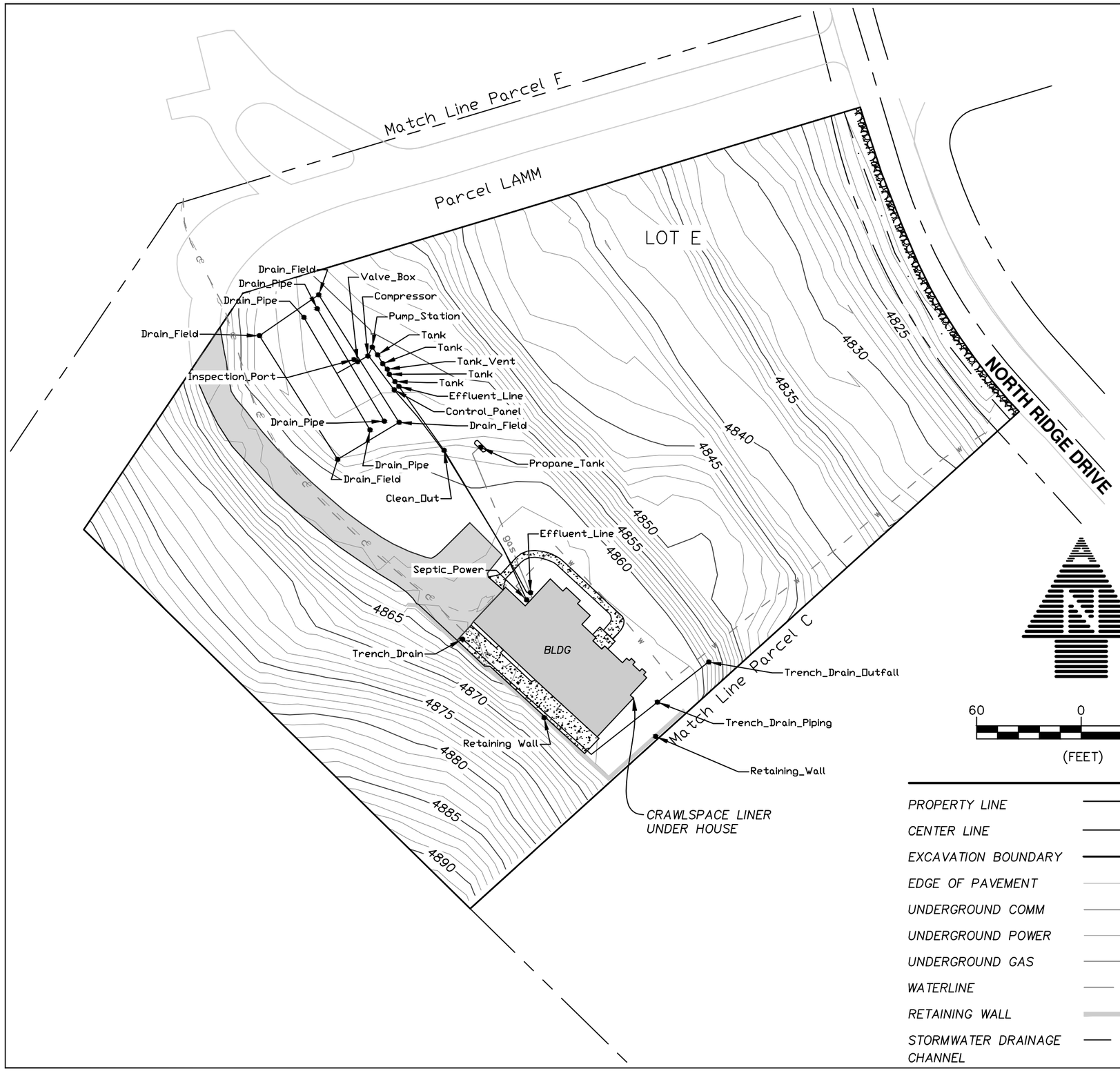
SURVEYED BY:	DNN
SCALE:	AS SHOWN

D.5



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
5006	Septic_Power	4853.94	220387.3250	4582742.3160
5025	Drain_Field	4855.14	220368.6430	4582745.0750
5017	Inspection_Port	4855.48	220404.6640	4582719.1980
5026	Drain_Field	4855.20	220347.5280	4582709.8650
5018	Compressor	4856.38	220406.7110	4582727.1560
5023	Tank	4855.70	220392.0860	4582742.7020
5024	Tank_Vent	4856.39	220399.1640	4582738.3090
5027	Drain_Field	4855.32	220418.3560	4582664.9870
5000	Effluent_Line	4859.20	220270.9970	4582820.4950
5003	Clean_Out	4856.55	220352.6460	4582770.9070
5004	Effluent_Line	4854.31	220389.3040	4582745.0140
5011	Septic_Power	4860.14	220266.8410	4582818.2460
5012	Drain_Pipe	4855.65	220433.9020	4582698.1430
5013	Drain_Pipe	4855.63	220428.9260	4582690.4860
5014	Drain_Pipe	4855.90	220364.3380	4582728.4310
5015	Drain_Pipe	4855.84	220369.3510	4582736.5480
5016	Valve_Box	4855.61	220403.4700	4582721.3030
5019	Pump_Station	4855.59	220411.7790	4582729.7430
5020	Tank	4855.65	220407.4200	4582732.8160
5021	Tank	4855.63	220402.3490	4582735.7270
5022	Tank	4855.84	220396.3020	4582739.5310
5028	Drain_Field	4854.37	220441.8410	4582699.0140

60 0 30 60

(FEET)

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LAND SURVEYOR

OREGON
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DANIEL J. O'CONNOR
90081

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LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM — c
UNDERGROUND POWER — e
UNDERGROUND GAS — gas
WATERLINE — w
RETAINING WALL
STORMWATER DRAINAGE CHANNEL

ASPHALT
CONCRETE
GRAVEL SHOULDER

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT E
FINAL LIFT
TOPOGRAPHIC SURVEY

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SURVEYED BY:	DNN
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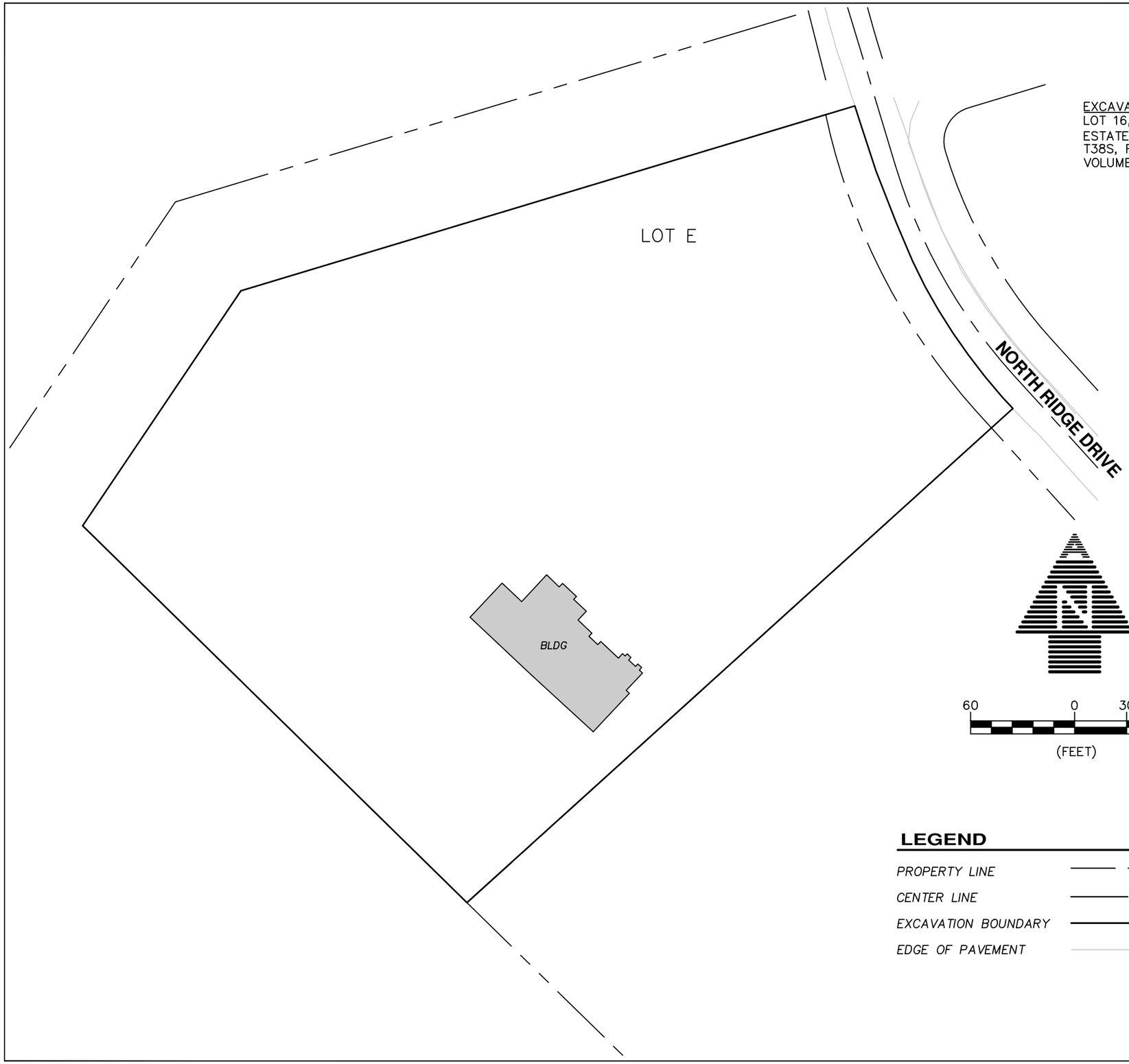
E.3



EXCAVATION DESCRIPTION FOR LOT E

LOT 16, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.

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OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGES ESTATES SUPERFUND SITE

LOT E

LEGAL DESCRIPTION

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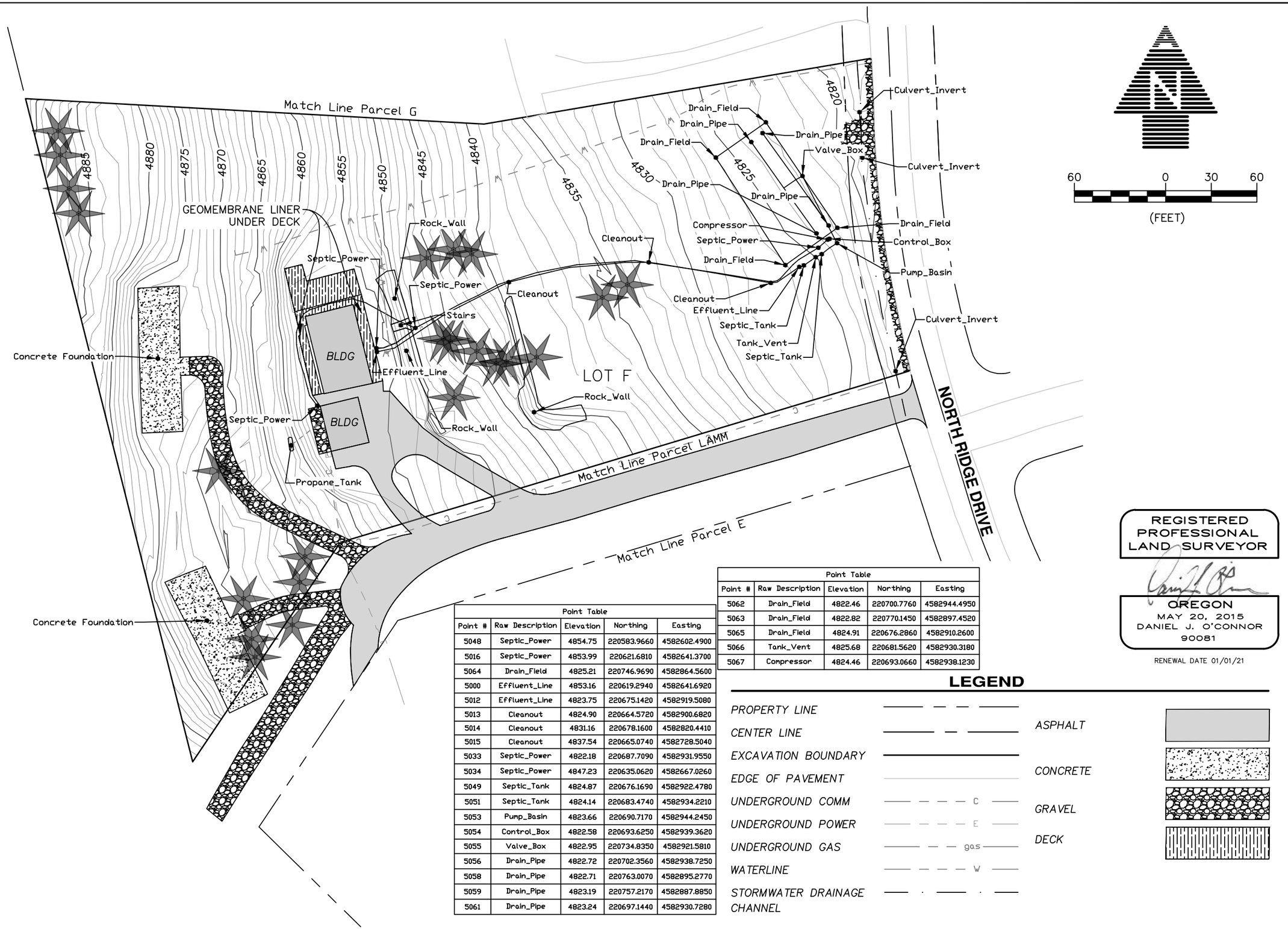
SURVEYED BY:	DNN
SCALE:	AS SHOWN

E.4



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
5048	Septic_Power	4854.75	220583.9660	4582602.4900
5016	Septic_Power	4853.99	220621.6810	4582641.3700
5064	Drain_Field	4825.21	220746.9690	4582864.5600
5000	Effluent_Line	4853.16	220619.2940	4582641.6920
5012	Effluent_Line	4823.75	220675.1420	4582919.5080
5013	Cleanout	4824.90	220664.5720	4582900.6820
5014	Cleanout	4831.16	220678.1600	4582820.4410
5015	Cleanout	4837.54	220665.0740	4582728.5040
5033	Septic_Power	4822.18	220687.7090	4582931.9550
5034	Septic_Power	4847.23	220635.0620	4582667.0260
5049	Septic_Tank	4824.87	220676.1690	4582922.4780
5051	Septic_Tank	4824.14	220683.4740	4582934.2210
5053	Pump_Basin	4823.66	220690.7170	4582944.2450
5054	Control_Box	4822.58	220693.6250	4582939.3620
5055	Valve_Box	4822.95	220734.8350	4582921.5810
5056	Drain_Pipe	4822.72	220702.3560	4582938.7250
5058	Drain_Pipe	4822.71	220763.0070	4582895.2770
5059	Drain_Pipe	4823.19	220757.2170	4582887.8850
5061	Drain_Pipe	4823.24	220697.1440	4582930.7280

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
5062	Drain_Field	4822.46	220700.7760	4582944.4950
5063	Drain_Field	4822.82	220770.1450	4582897.4520
5065	Drain_Field	4824.91	220676.2860	4582910.2600
5066	Tank_Vent	4825.68	220681.5620	4582930.3180
5067	Compressor	4824.46	220693.0660	4582938.1230

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM — C
UNDERGROUND POWER — E
UNDERGROUND GAS — gas
WATERLINE — W
STORMWATER DRAINAGE CHANNEL

ASPHALT
CONCRETE
GRAVEL
DECK

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DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT F
FINAL LIFT
TOPOGRAPHIC SURVEY

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DRAWN BY:	ZEF
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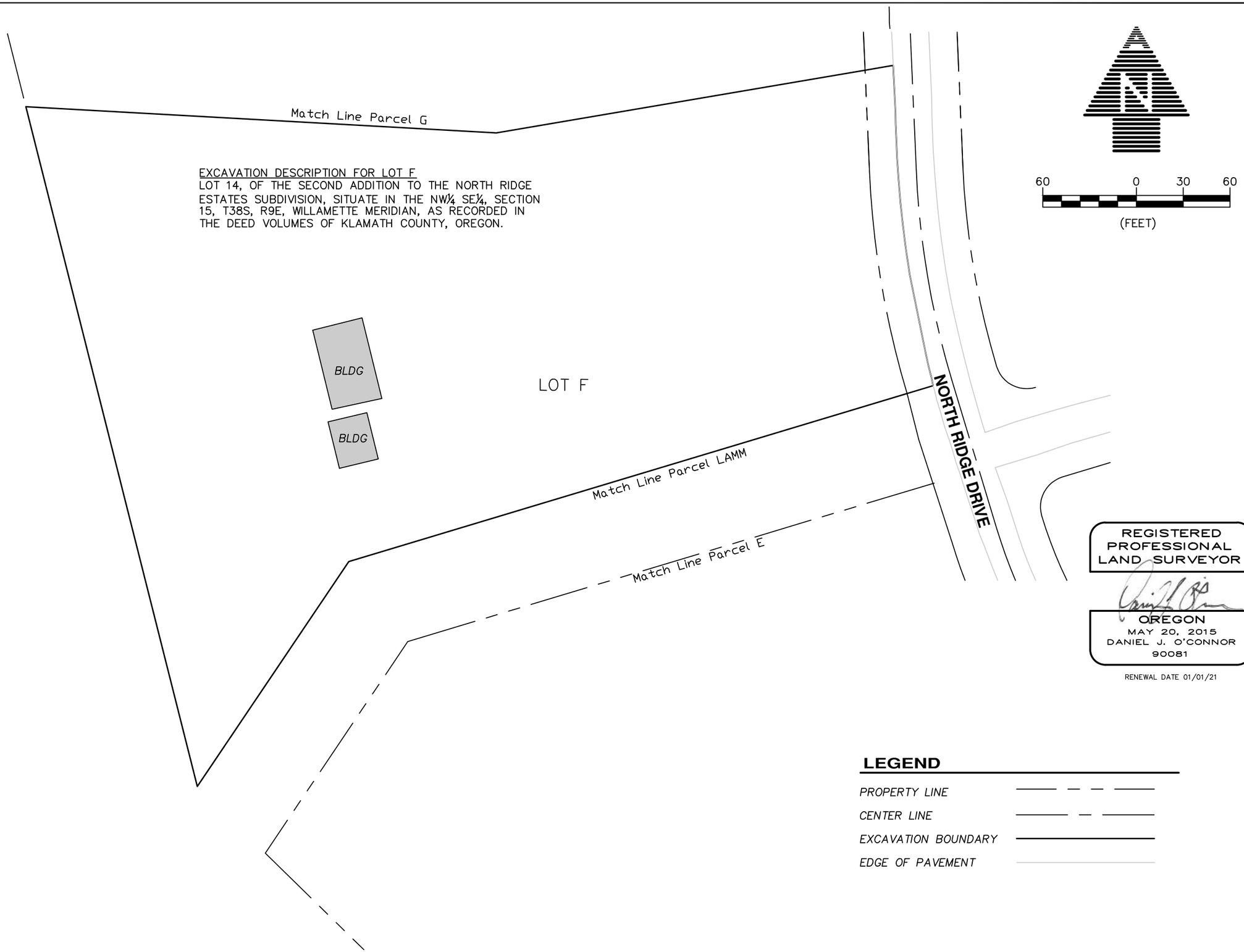
SURVEYED BY:	DNN
SCALE:	AS SHOWN

F.3



No.	REVISION	DATE	BY

NORTHRIDGE ESTATES SUPERFUND SITE

LOT F

LEGAL DESCRIPTION

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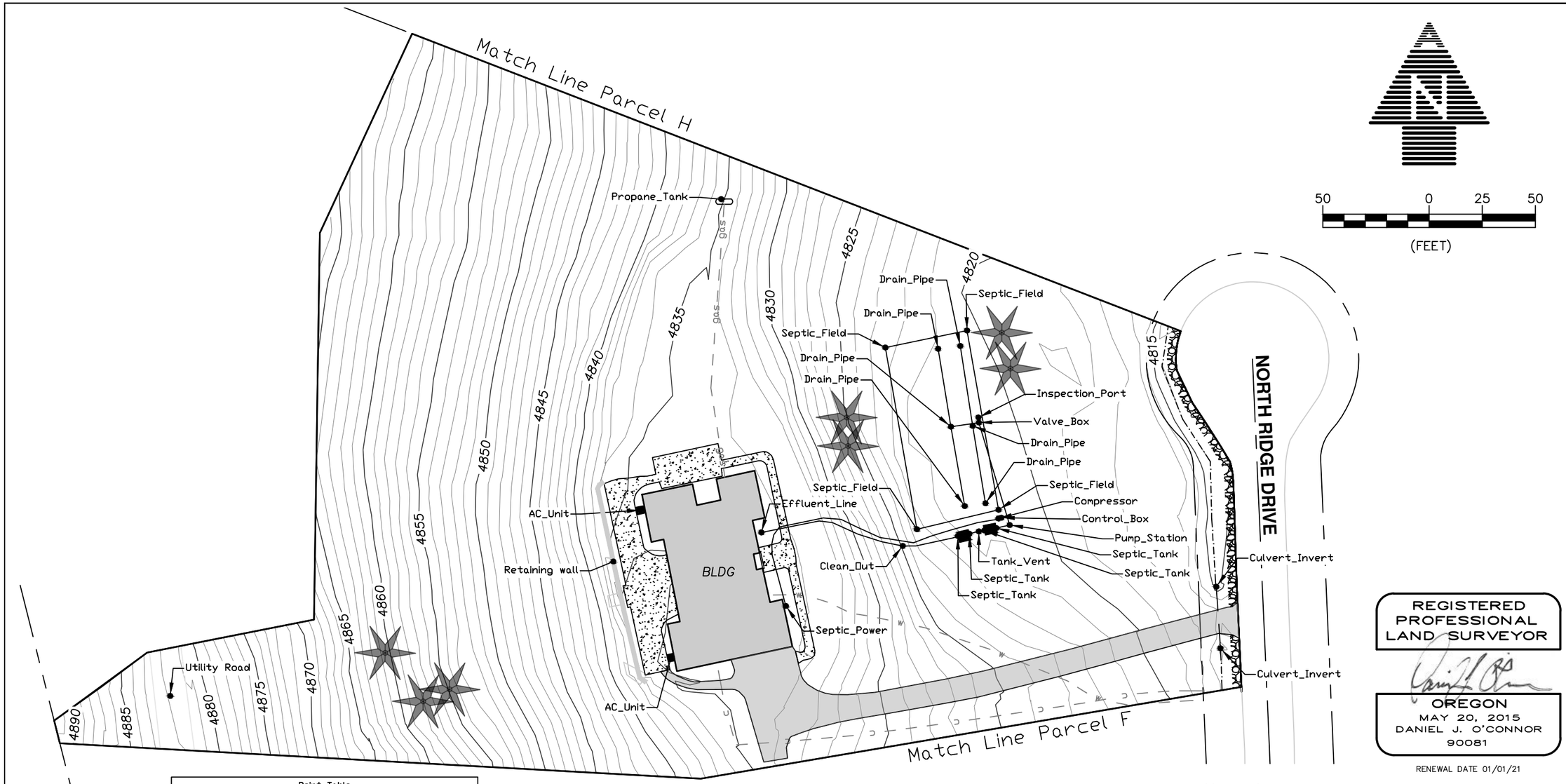
F.4



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
9	Culvert_Invert	4815.45	220830.3530	4582956.7760
10	Culvert_Invert	4814.42	220859.3490	4582954.7610
7042	Compressor	4821.17	220891.4550	4582852.2850
7034	Drain_Pipe	4820.26	220971.3100	4582823.8770
7035	Drain_Pipe	4820.12	220934.6500	4582829.9340
7036	Drain_Pipe	4820.44	220897.2890	4582836.4090
7037	Valve_Box	4820.33	220936.5750	4582843.0750
7038	Septic_Field	4819.64	220979.8930	4582837.5200
7039	Septic_Field	4820.94	220971.8720	4582799.0880
7040	Septic_Field	4820.67	220886.4030	4582813.8950
7041	Septic_Field	4819.60	220895.5600	4582852.3550
7043	Tank_Vent	4821.94	220885.3570	4582843.0510
7044	Inspection_Port	4820.30	220938.9840	4582842.8690
7000	Effluent_Line	4832.47	220884.8990	4582740.7370
7008	Septic_Tank	4820.42	220883.1950	4582833.1670

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
7009	Septic_Tank	4820.10	220884.2570	4582838.6080
7010	Septic_Tank	4820.69	220885.7910	4582845.6790
7011	Septic_Tank	4820.66	220886.9760	4582851.2660
7012	Pump_Station	4820.66	220888.3370	4582857.6010
7013	Control_Box	4817.35	220891.8270	4582853.6940
7029	Septic_Power	4832.48	220850.3230	4582752.2750
7031	Drain_Pipe	4820.59	220898.5900	4582846.2020
7032	Drain_Pipe	4819.84	220935.0480	4582840.1360
7033	Drain_Pipe	4820.21	220972.6090	4582834.3200
7030	Clean_Out	4825.79	220878.5300	4582807.2200

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
RETAINING WALL
EDGE OF PAVEMENT
UNDERGROUND COMM — c
WATERLINE — w
GAS LINE — gas
STORMWATER DRAINAGE CHANNEL

TREE
ASPHALT
CONCRETE
GRAVEL SHOULDER

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT G
FINAL LIFT
TOPOGRAPHIC SURVEY

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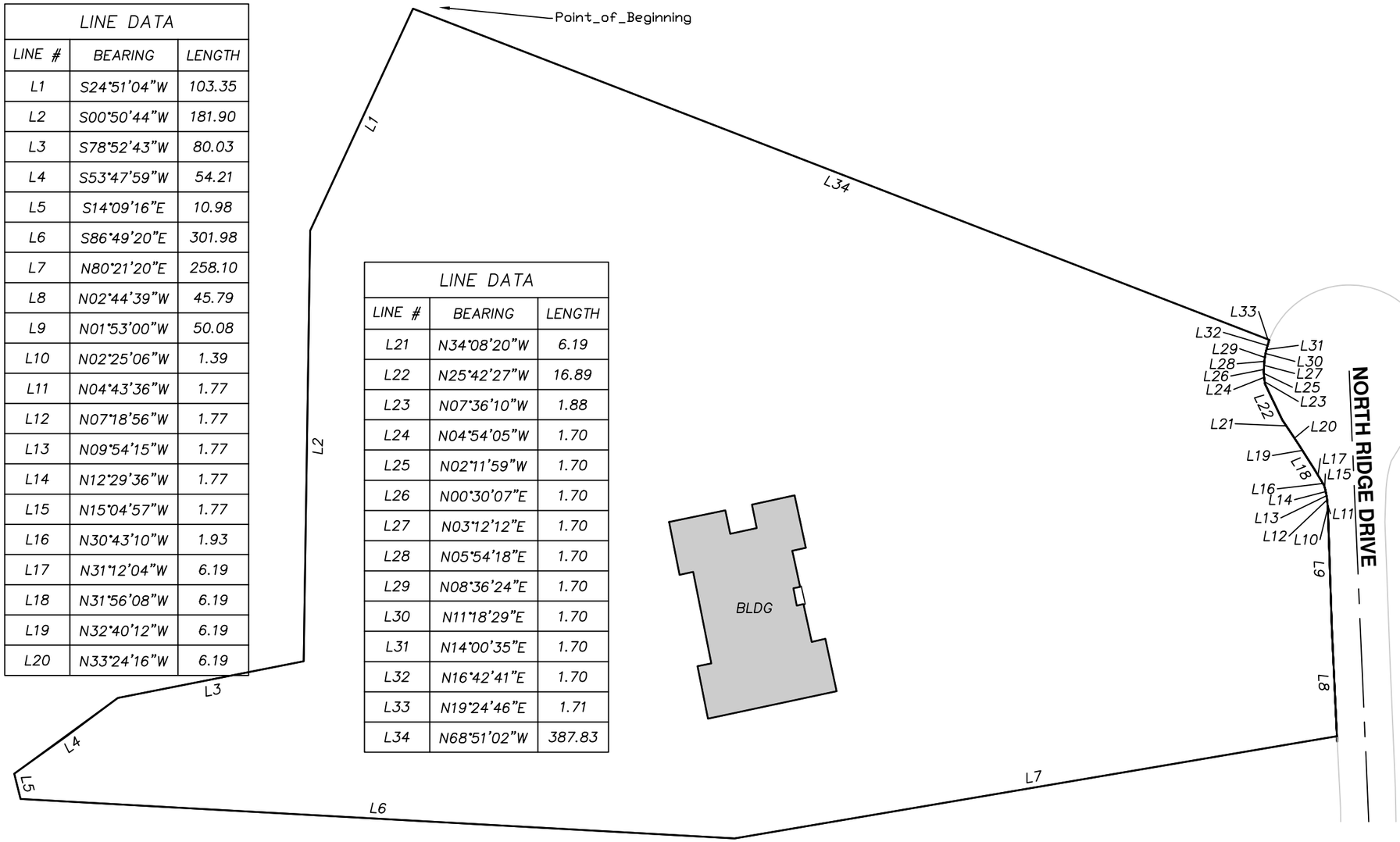
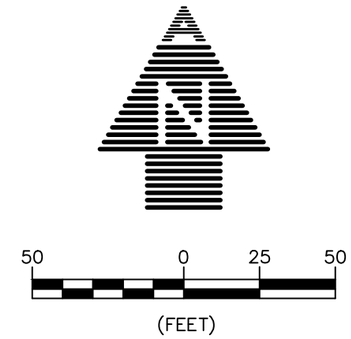
G.3

LINE DATA		
LINE #	BEARING	LENGTH
L1	S24°51'04"W	103.35
L2	S00°50'44"W	181.90
L3	S78°52'43"W	80.03
L4	S53°47'59"W	54.21
L5	S14°09'16"E	10.98
L6	S86°49'20"E	301.98
L7	N80°21'20"E	258.10
L8	N02°44'39"W	45.79
L9	N01°53'00"W	50.08
L10	N02°25'06"W	1.39
L11	N04°43'36"W	1.77
L12	N07°18'56"W	1.77
L13	N09°54'15"W	1.77
L14	N12°29'36"W	1.77
L15	N15°04'57"W	1.77
L16	N30°43'10"W	1.93
L17	N31°12'04"W	6.19
L18	N31°56'08"W	6.19
L19	N32°40'12"W	6.19
L20	N33°24'16"W	6.19

LINE DATA		
LINE #	BEARING	LENGTH
L21	N34°08'20"W	6.19
L22	N25°42'27"W	16.89
L23	N07°36'10"W	1.88
L24	N04°54'05"W	1.70
L25	N02°11'59"W	1.70
L26	N00°30'07"E	1.70
L27	N03°12'12"E	1.70
L28	N05°54'18"E	1.70
L29	N08°36'24"E	1.70
L30	N11°18'29"E	1.70
L31	N14°00'35"E	1.70
L32	N16°42'41"E	1.70
L33	N19°24'46"E	1.71
L34	N68°51'02"W	387.83





REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

CENTER LINE

EXCAVATION BOUNDARY

EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT G
LEGAL EXHIBIT
TOPOGRAPHIC SURVEY

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G.4

EXCAVATION DESCRIPTION FOR LOT G

A PORTION OF LOT 13, BLOCK 3 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S27°04'49"W A DISTANCE OF 2327.09 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S24°51'04"W 103.35 FEET
- S00°50'44"W 181.90 FEET
- S78°52'43"W 80.03 FEET
- S53°47'59"W 54.21 FEET
- S14°09'16"E 10.98 FEET
- S86°49'20"E 301.98 FEET
- N80°21'20"E 258.10 FEET
- N02°44'39"W 45.79 FEET
- N01°53'00"W 50.08 FEET
- N02°25'06"W 1.39 FEET
- N04°43'36"W 1.77 FEET
- N07°18'56"W 1.77 FEET
- N09°54'15"W 1.77 FEET
- N12°29'36"W 1.77 FEET
- N15°04'57"W 1.77 FEET
- N30°43'10"W 1.93 FEET
- N31°12'04"W 6.19 FEET
- N31°56'08"W 6.19 FEET
- N32°40'12"W 6.19 FEET
- N33°24'16"W 6.19 FEET
- N34°08'20"W 6.19 FEET
- N25°42'27"W 16.89 FEET
- N07°36'10"W 1.88 FEET
- N04°54'05"W 1.70 FEET
- N02°11'59"W 1.70 FEET
- N00°30'07"E 1.70 FEET
- N03°12'12"E 1.70 FEET
- N05°54'18"E 1.70 FEET
- N08°36'24"E 1.70 FEET
- N11°18'29"E 1.70 FEET
- N14°00'35"E 1.70 FEET
- N16°42'41"E 1.70 FEET
- N19°24'46"E 1.71 FEET
- N68°51'02"W 387.83 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N17°03'35"W A DISTANCE OF 3392.14 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 2.72 ACRES, MORE OR LESS.

50 0 25 50

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT G
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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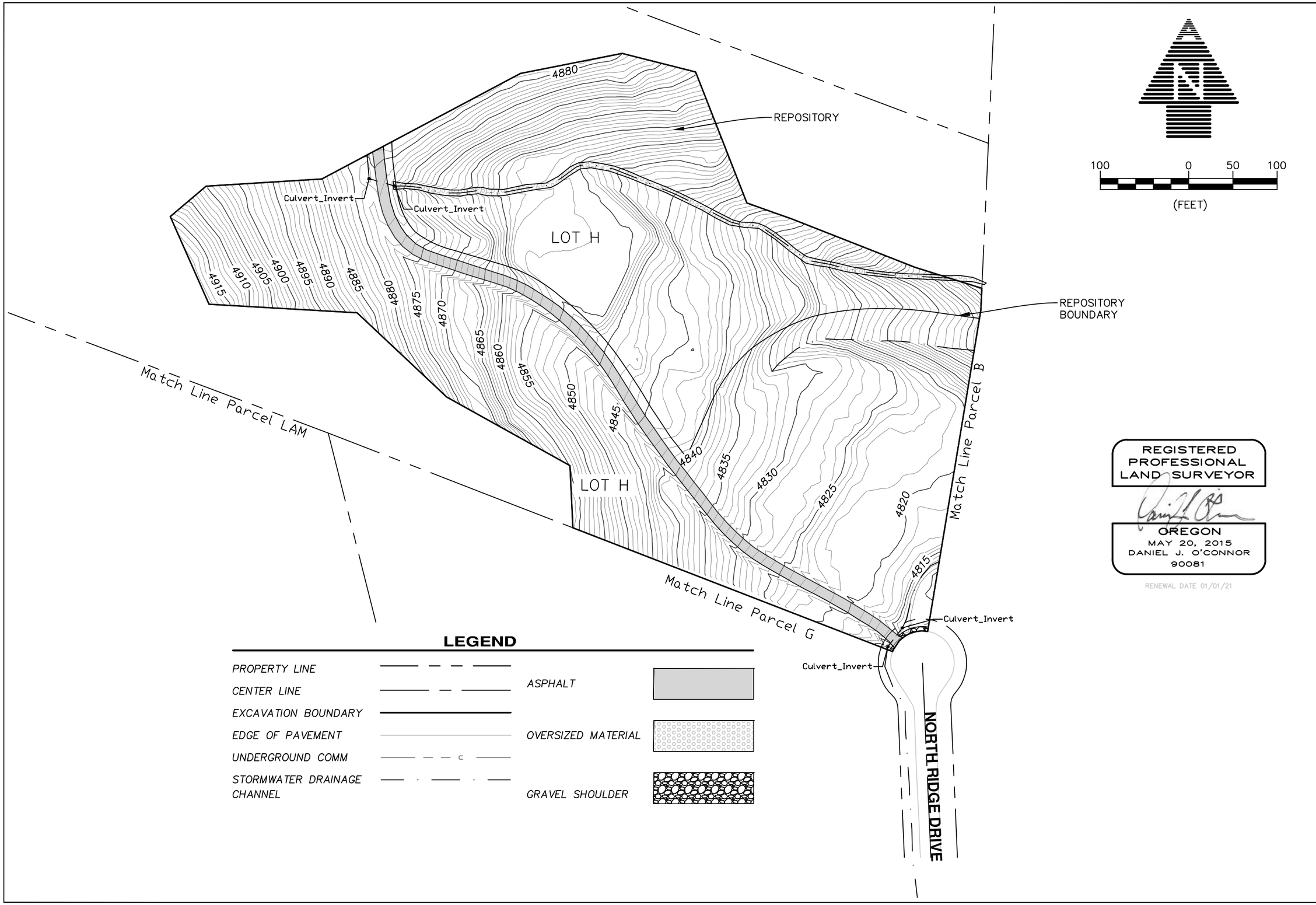
SURVEYED BY:	DNN
SCALE:	AS SHOWN

G.5



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NORTH RIDGE ESTATES SUPERFUND SITE
LOT H
FINAL LIFT
TOPOGRAPHIC SURVEY

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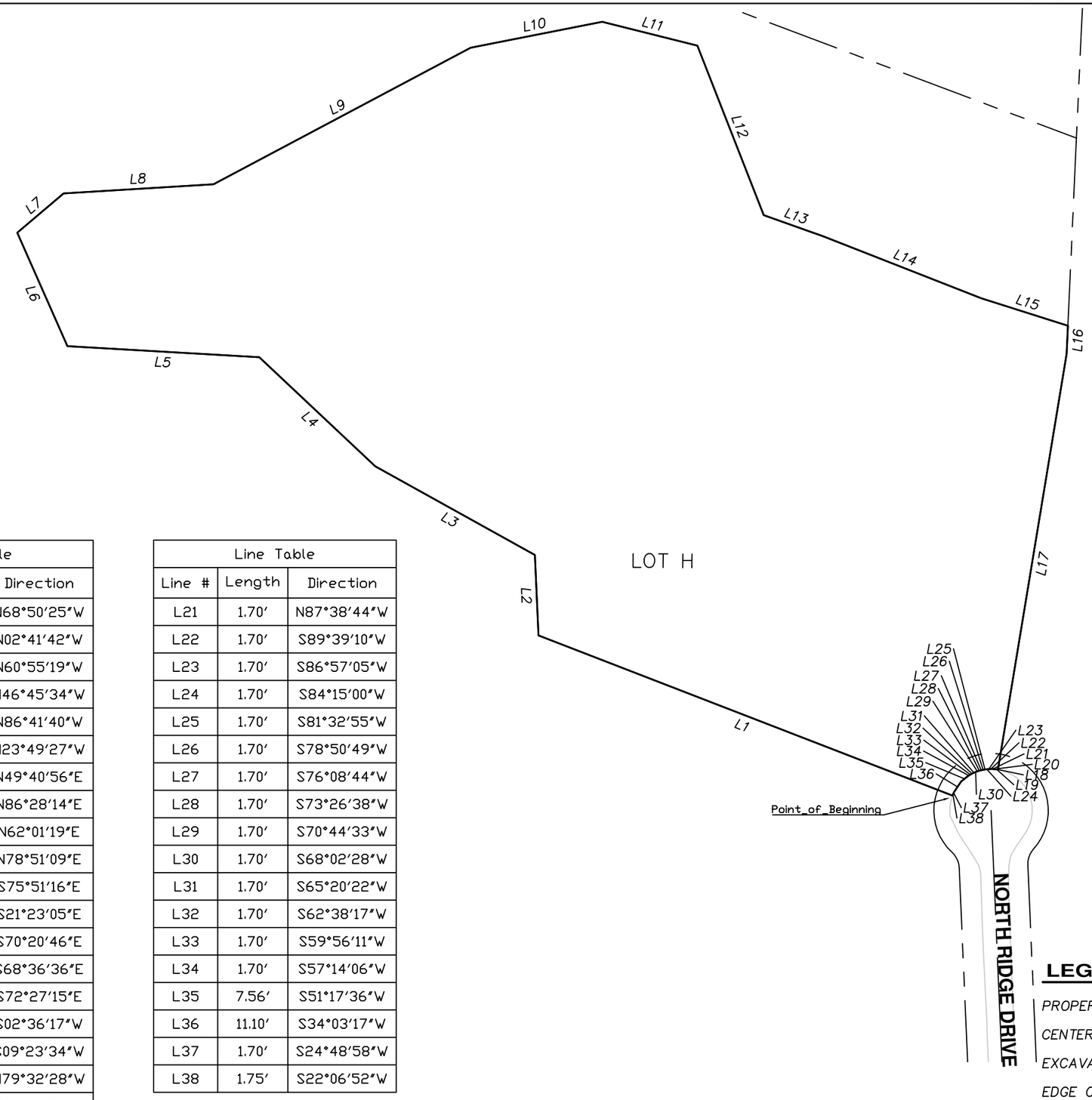
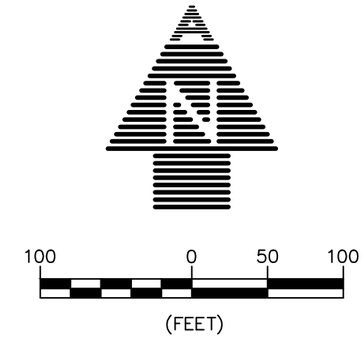
SURVEYED BY:	DNN
SCALE:	AS SHOWN

H.3





Line Table		
Line #	Length	Direction
L1	387.83′	N68°50′25″W
L2	70.36′	N02°41′42″W
L3	159.57′	N60°55′19″W
L4	139.12′	N46°45′34″W
L5	167.85′	N86°41′40″W
L6	108.43′	N23°49′27″W
L7	52.99′	N49°40′56″E
L8	131.33′	N86°28′14″E
L9	254.35′	N62°01′19″E
L10	117.21′	N78°51′09″E
L11	85.72′	S75°51′16″E
L12	159.00′	S21°23′05″E
L13	54.39′	S70°20′46″E
L14	149.20′	S68°36′36″E
L15	79.36′	S72°27′15″E
L16	24.76′	S02°36′17″W
L17	368.15′	S09°23′34″W
L18	0.29′	N79°32′28″W
L19	1.70′	N82°14′34″W
L20	1.70′	N84°56′39″W

Line Table		
Line #	Length	Direction
L21	1.70′	N87°38′44″W
L22	1.70′	S89°39′10″W
L23	1.70′	S86°57′05″W
L24	1.70′	S84°15′00″W
L25	1.70′	S81°32′55″W
L26	1.70′	S78°50′49″W
L27	1.70′	S76°08′44″W
L28	1.70′	S73°26′38″W
L29	1.70′	S70°44′33″W
L30	1.70′	S68°02′28″W
L31	1.70′	S65°20′22″W
L32	1.70′	S62°38′17″W
L33	1.70′	S59°56′11″W
L34	1.70′	S57°14′06″W
L35	7.56′	S51°17′36″W
L36	11.10′	S34°03′17″W
L37	1.70′	S24°48′58″W
L38	1.75′	S22°06′52″W

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT H
LEGAL EXHIBIT
TOPOGRAPHIC SURVEY

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SCALE:	AS SHOWN

H.4

EXCAVATION DESCRIPTION FOR LOT H

A PORTION OF LOT 12, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW1/4, OF SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S18°06'01"E A DISTANCE OF 2315.34 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N68°50'25"W 387.83 FEET
- N02°41'42"W 70.36 FEET
- N60°55'19"W 159.57 FEET
- N46°45'34"W 139.12 FEET
- N86°41'40"W 167.85 FEET
- N23°49'27"W 108.43 FEET
- N49°40'56"E 52.99 FEET
- N86°28'14"E 131.33 FEET
- N62°01'19"E 254.35 FEET
- N78°51'09"E 117.21 FEET
- S75°51'16"E 85.72 FEET
- S21°23'05"E 159.00 FEET
- S70°20'46"E 54.39 FEET
- S68°36'36"E 149.20 FEET
- S72°27'15"E 79.36 FEET
- S02°36'17"W 24.76 FEET
- S09°23'34"W 368.15 FEET
- N79°32'28"W 0.29 FEET
- N82°14'34"W 1.70 FEET
- N84°56'39"W 1.70 FEET
- N87°38'44"W 1.70 FEET
- S89°39'10"W 1.70 FEET
- S86°57'05"W 1.70 FEET
- S84°15'00"W 1.70 FEET
- S81°32'55"W 1.70 FEET
- S78°50'49"W 1.70 FEET
- S76°08'44"W 1.70 FEET
- S73°26'38"W 1.70 FEET
- S70°44'33"W 1.70 FEET
- S68°02'28"W 1.70 FEET
- S65°20'22"W 1.70 FEET
- S62°38'17"W 1.70 FEET
- S59°56'11"W 1.70 FEET
- S57°14'06"W 1.70 FEET
- S51°17'36"W 7.56 FEET
- S34°03'17"W 11.10 FEET
- S24°48'58"W 1.70 FEET
- S22°06'52"W 1.75 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N11°32'19"E A DISTANCE OF 3166.89 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 7.31 ACRES, MORE OR LESS.

100 0 50 100

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT H

LEGAL DESCRIPTION

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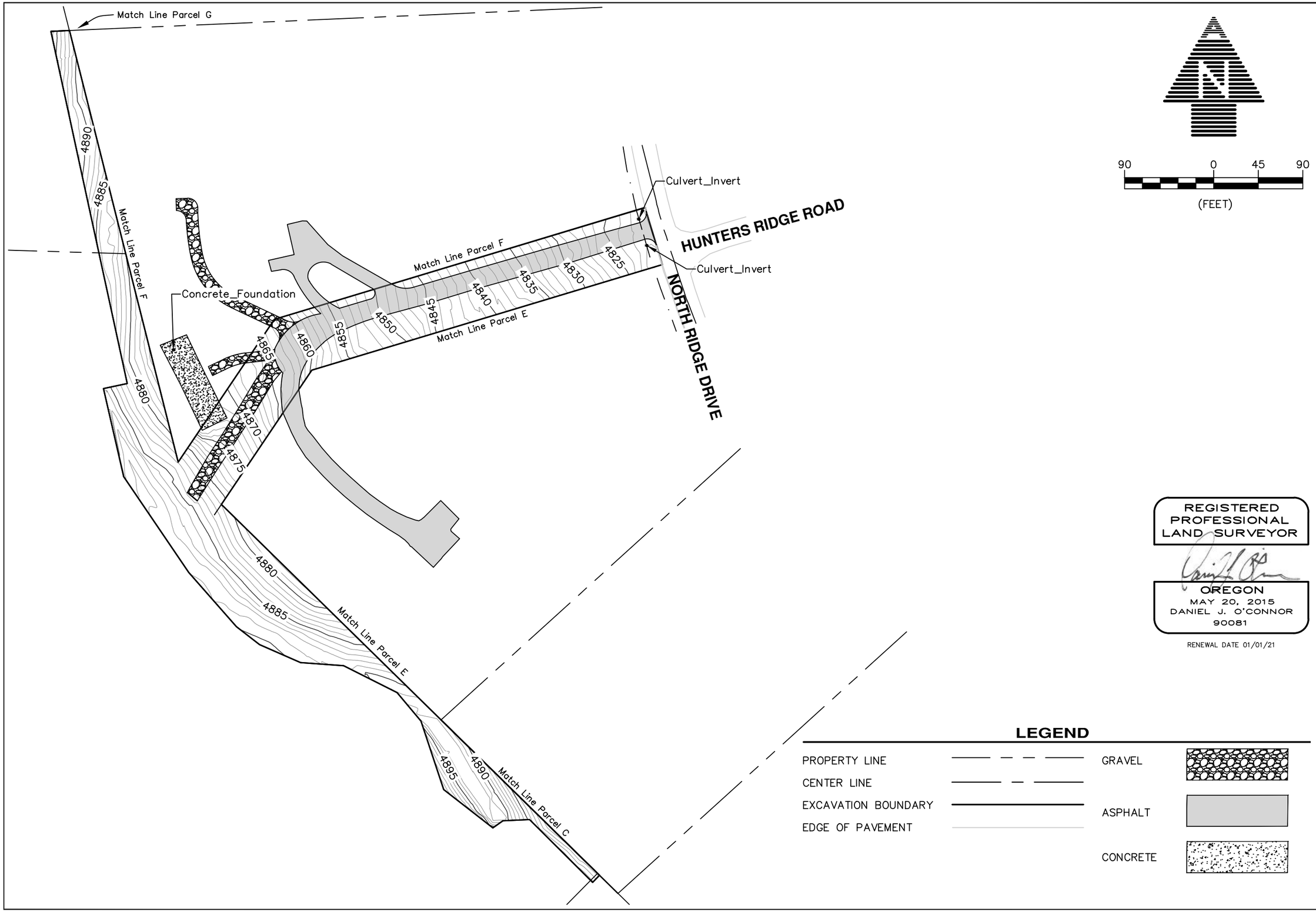
H.5



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LOT LAM

FINAL LIFT

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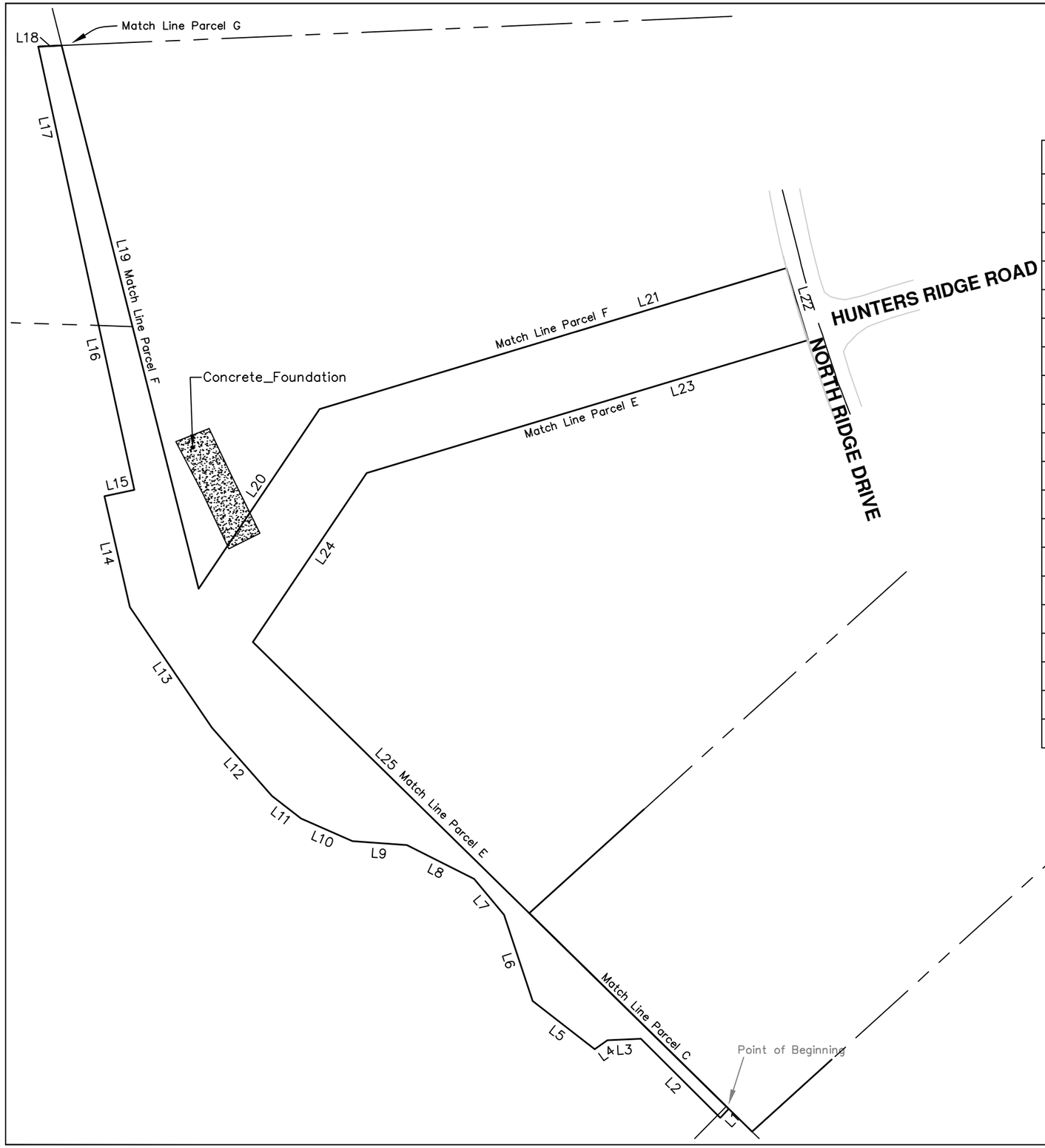
LAM.3



LINE DATA		
LINE #	BEARING	LENGTH
L1	S43°38'05"W	9.89
L2	N45°11'05"W	89.92
L3	S87°27'47"W	26.88
L4	S54°35'47"W	12.48
L5	N52°06'45"W	63.04
L6	N18°18'51"W	72.92
L7	N39°56'02"W	37.57
L8	N63°23'57"W	60.41
L9	N85°52'50"W	43.67
L10	N66°16'10"W	45.12
L11	N52°10'10"W	29.59
L12	N41°20'46"W	72.91
L13	N34°12'04"W	117.01
L14	N12°57'10"W	91.23
L15	N77°45'17"E	24.61
L16	N12°14'43"W	233.39
L17	N12°12'59"W	130.47
L18	N87°30'20"E	18.74
L19	S14°09'16"E	343.49

90 0 45 90

(FEET)

LINE DATA		
LINE #	BEARING	LENGTH
L20	N33°57'30"E	173.83
L21	N73°11'31"E	391.14
L22	S16°55'02"E	60.32
L23	S73°14'24"W	369.90
L24	S33°57'30"W	163.55
L25	S45°33'46"E	534.89

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE

CENTER LINE

EXCAVATION BOUNDARY

EDGE OF PAVEMENT

CONCRETE

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NORTH RIDGE ESTATES SUPERFUND SITE

LOT LAM

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SCALE:	AS SHOWN

LAM.4

EXCAVATION DESCRIPTION FOR LOT LAM

A PORTION OF AN ACCESS AND UTILITY EASEMENT THAT BENEFITS LOTS 14, 15, AND 16 OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION A PORTION OF LOT 15, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NE 1/4, SE 1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S12°21'17"W A DISTANCE OF 3324.60 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S43°38'05"W 9.89 FEET
- N45°11'05"W 89.92 FEET
- S87°27'47"W 26.88 FEET
- S54°35'47"W 12.48 FEET
- N52°06'45"W 63.04 FEET
- N18°18'51"W 72.92 FEET
- N39°56'02"W 37.57 FEET
- N63°23'57"W 60.41 FEET
- N85°52'50"W 43.67 FEET
- N66°16'10"W 45.12 FEET
- N52°10'10"W 29.59 FEET
- N41°20'46"W 72.91 FEET
- N34°12'04"W 117.01 FEET
- N12°57'10"W 91.23 FEET
- N77°45'17"E 24.61 FEET
- N12°14'43"W 233.39 FEET
- N12°12'59"W 130.47 FEET
- N87°30'20"E 18.74 FEET
- S14°09'16"E 343.49 FEET
- N33°57'30"E 173.83 FEET
- N73°11'31"E 391.14 FEET
- S16°55'02"E 60.32 FEET
- S73°14'24"W 369.90 FEET
- S33°57'30"W 163.55 FEET
- S45°33'46"E 534.89 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N16°55'14"W A DISTANCE OF 2149.07 FEET FROM THE 1/4 CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 1.76 ACRES, MORE OR LESS.

90 0 45 90

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT LAM

LEGAL DESCRIPTION

TOPOGRAPHIC SURVEY

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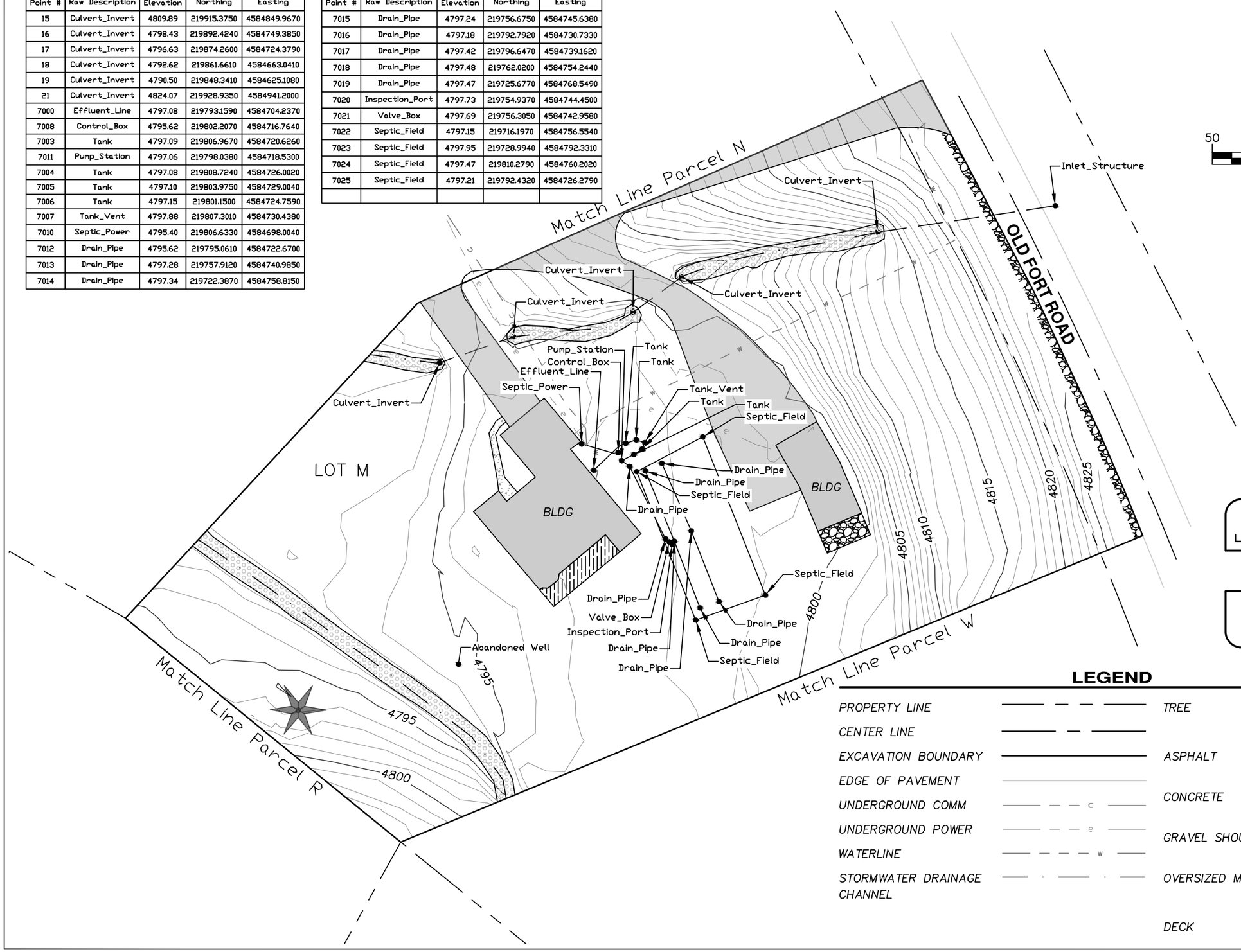
SURVEYED BY:	DNN
SCALE:	AS SHOWN

LAM.5

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
15	Culvert_Invert	4809.89	219915.3750	4584849.9670
16	Culvert_Invert	4798.43	219892.4240	4584749.3850
17	Culvert_Invert	4796.63	219874.2600	4584724.3790
18	Culvert_Invert	4792.62	219861.6610	4584663.0410
19	Culvert_Invert	4790.50	219848.3410	4584625.1080
21	Culvert_Invert	4824.07	219928.9350	4584941.2000
7000	Effluent_Line	4797.08	219793.1590	4584704.2370
7008	Control_Box	4795.62	219802.2070	4584716.7640
7003	Tank	4797.09	219806.9670	4584720.6260
7011	Pump_Station	4797.06	219798.0380	4584718.5300
7004	Tank	4797.08	219808.7240	4584726.0020
7005	Tank	4797.10	219803.9750	4584729.0040
7006	Tank	4797.15	219801.1500	4584724.7590
7007	Tank_Vent	4797.88	219807.3010	4584730.4380
7010	Septic_Power	4795.40	219806.6330	4584698.0040
7012	Drain_Pipe	4795.62	219795.0610	4584722.6700
7013	Drain_Pipe	4797.28	219757.9120	4584740.9850
7014	Drain_Pipe	4797.34	219722.3870	4584758.8150

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
7015	Drain_Pipe	4797.24	219756.6750	4584745.6380
7016	Drain_Pipe	4797.18	219792.7920	4584730.7330
7017	Drain_Pipe	4797.42	219796.6470	4584739.1620
7018	Drain_Pipe	4797.48	219762.0200	4584754.2440
7019	Drain_Pipe	4797.47	219725.6770	4584768.5490
7020	Inspection_Port	4797.73	219754.9370	4584744.4500
7021	Valve_Box	4797.69	219756.3050	4584742.9580
7022	Septic_Field	4797.15	219716.1970	4584756.5540
7023	Septic_Field	4797.95	219728.9940	4584792.3310
7024	Septic_Field	4797.47	219810.2790	4584760.2020
7025	Septic_Field	4797.21	219792.4320	4584726.2790



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LEGEND

PROPERTY LINE	TREE
CENTER LINE	
EXCAVATION BOUNDARY	ASPHALT
EDGE OF PAVEMENT	
UNDERGROUND COMM	CONCRETE
UNDERGROUND POWER	GRAVEL SHOULDER
WATERLINE	OVERSIZED MATERIAL
STORMWATER DRAINAGE CHANNEL	DECK

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT M
FINAL LIFT
TOPOGRAPHIC SURVEY

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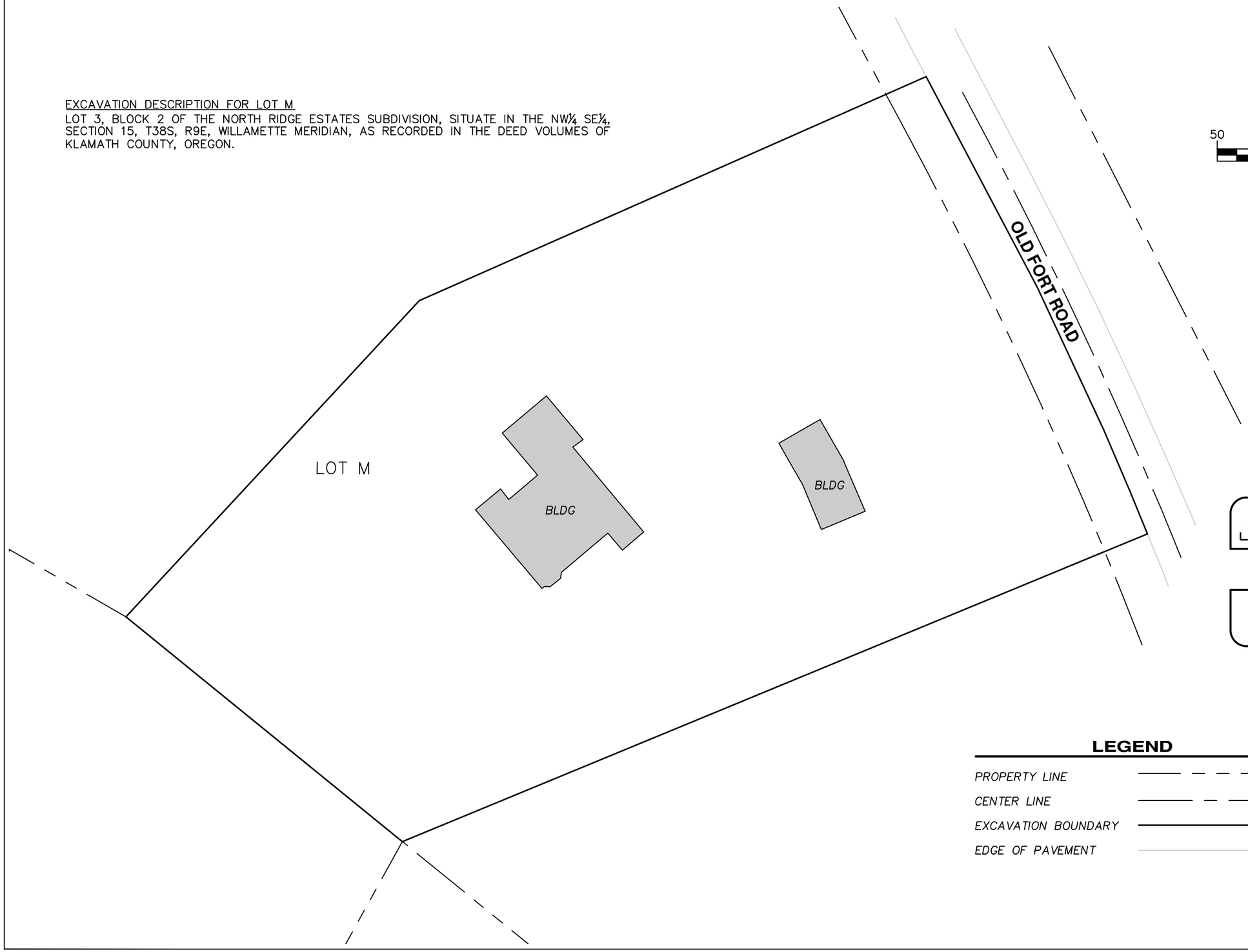
SURVEYED BY:	DNN
SCALE:	AS SHOWN

M.3

EXCAVATION DESCRIPTION FOR LOT M

LOT 3, BLOCK 2 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



50 0 25 50

(FEET)

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DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT M

LEGAL DESCRIPTION

TOPOGRAPHIC SURVEY

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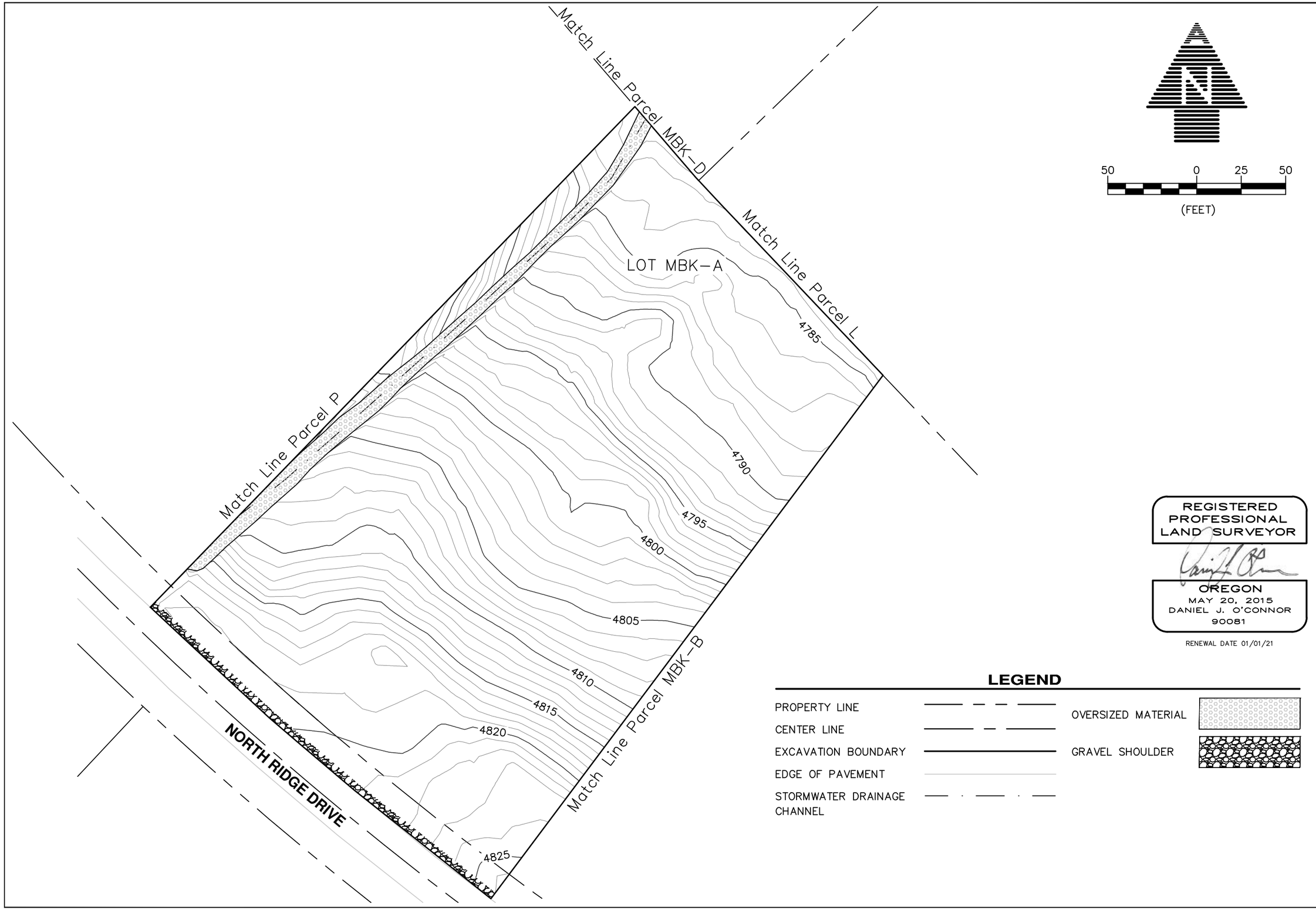
SCALE:	AS SHOWN

M.4



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90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	
STORMWATER DRAINAGE CHANNEL	
OVERSIZED MATERIAL	
GRAVEL SHOULDER	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-A
FINAL LIFT
TOPOGRAPHIC SURVEY

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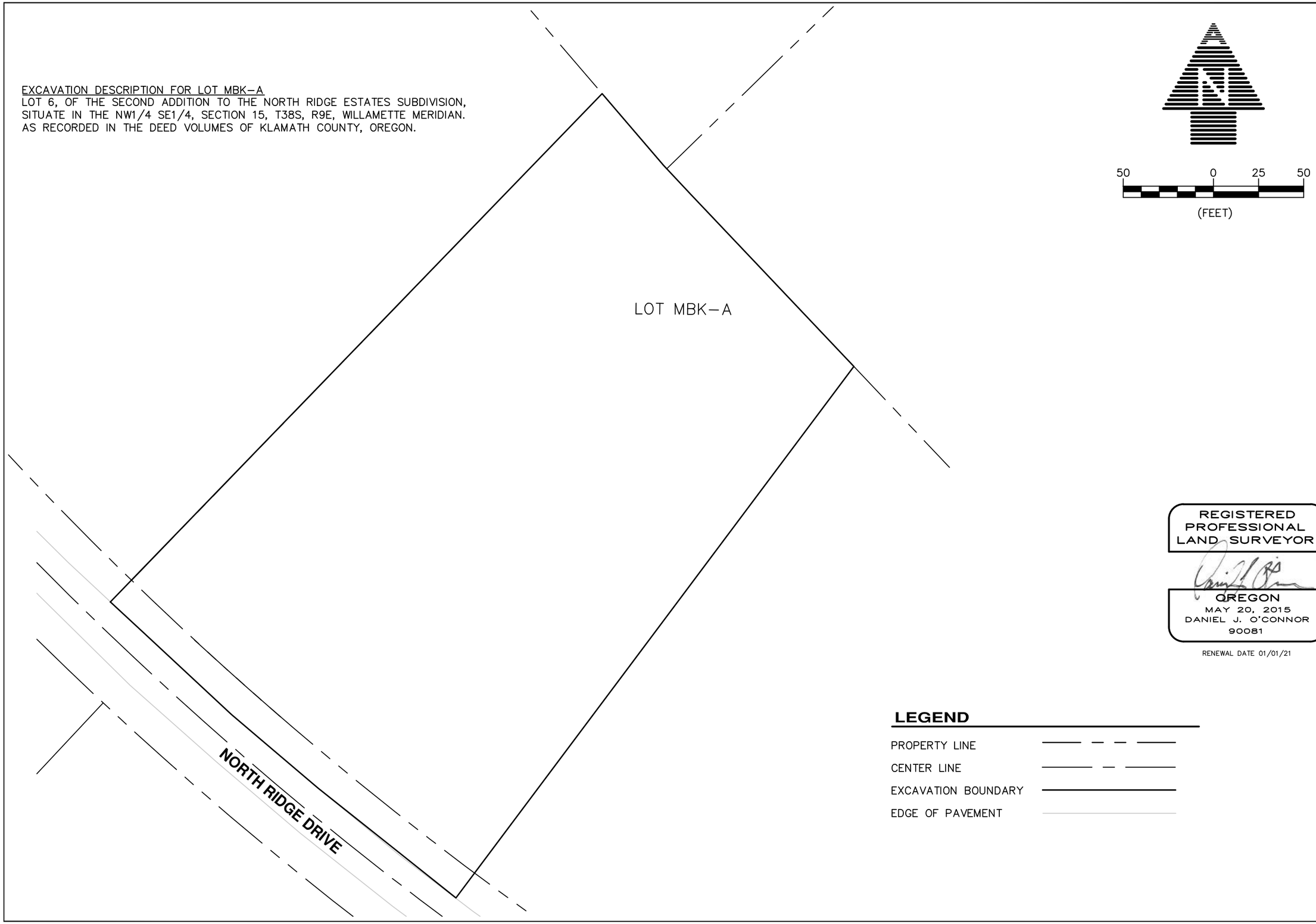
MBK-A.3

EXCAVATION DESCRIPTION FOR LOT MBK–A
LOT 6, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW1/4 SE1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



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RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-A
LEGAL DESCRIPTION
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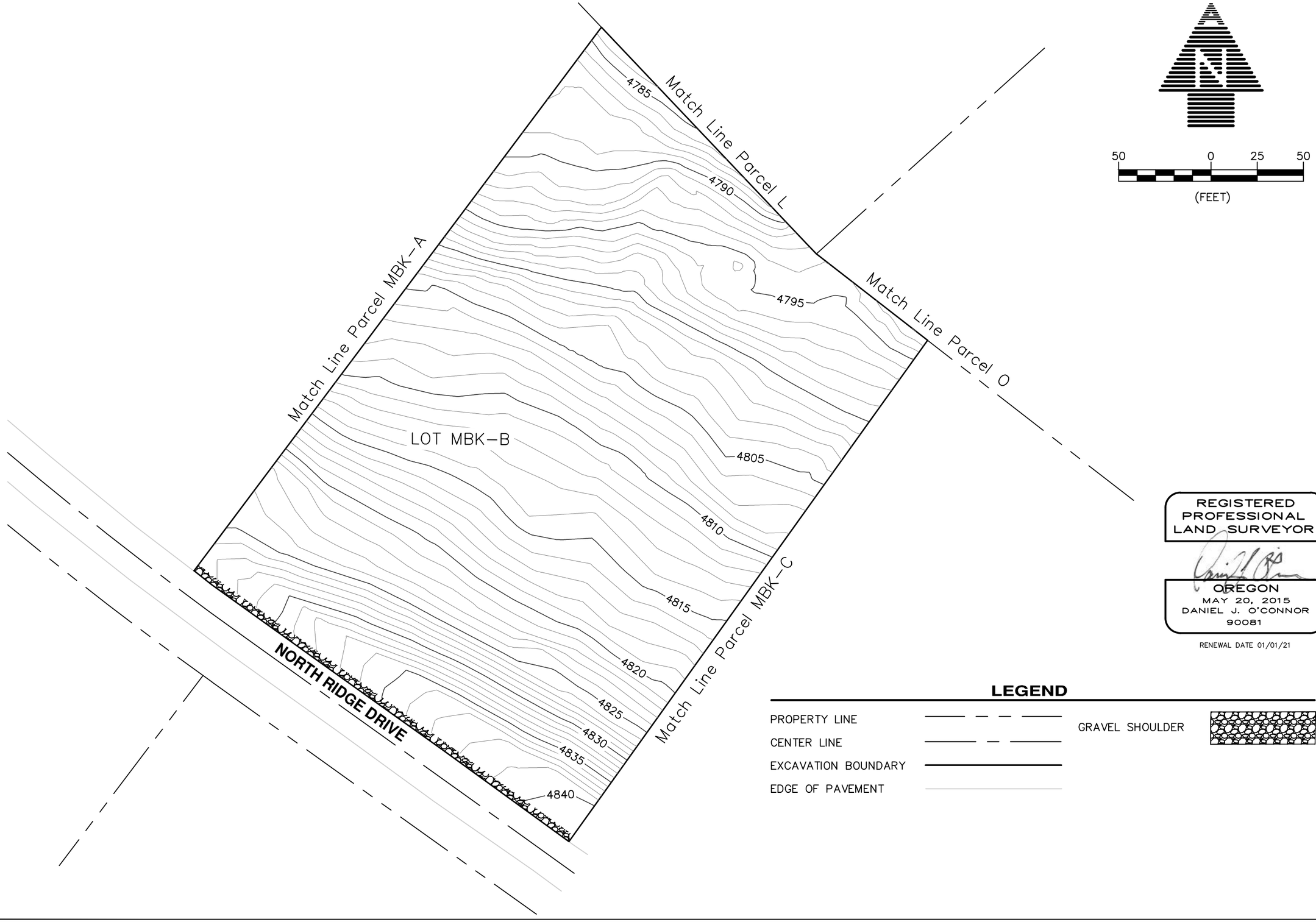
SURVEYED BY:	DNN
SCALE:	AS SHOWN

MBK-A.4



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LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
GRAVEL SHOULDER

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-B
FINAL LIFT
TOPOGRAPHIC SURVEY

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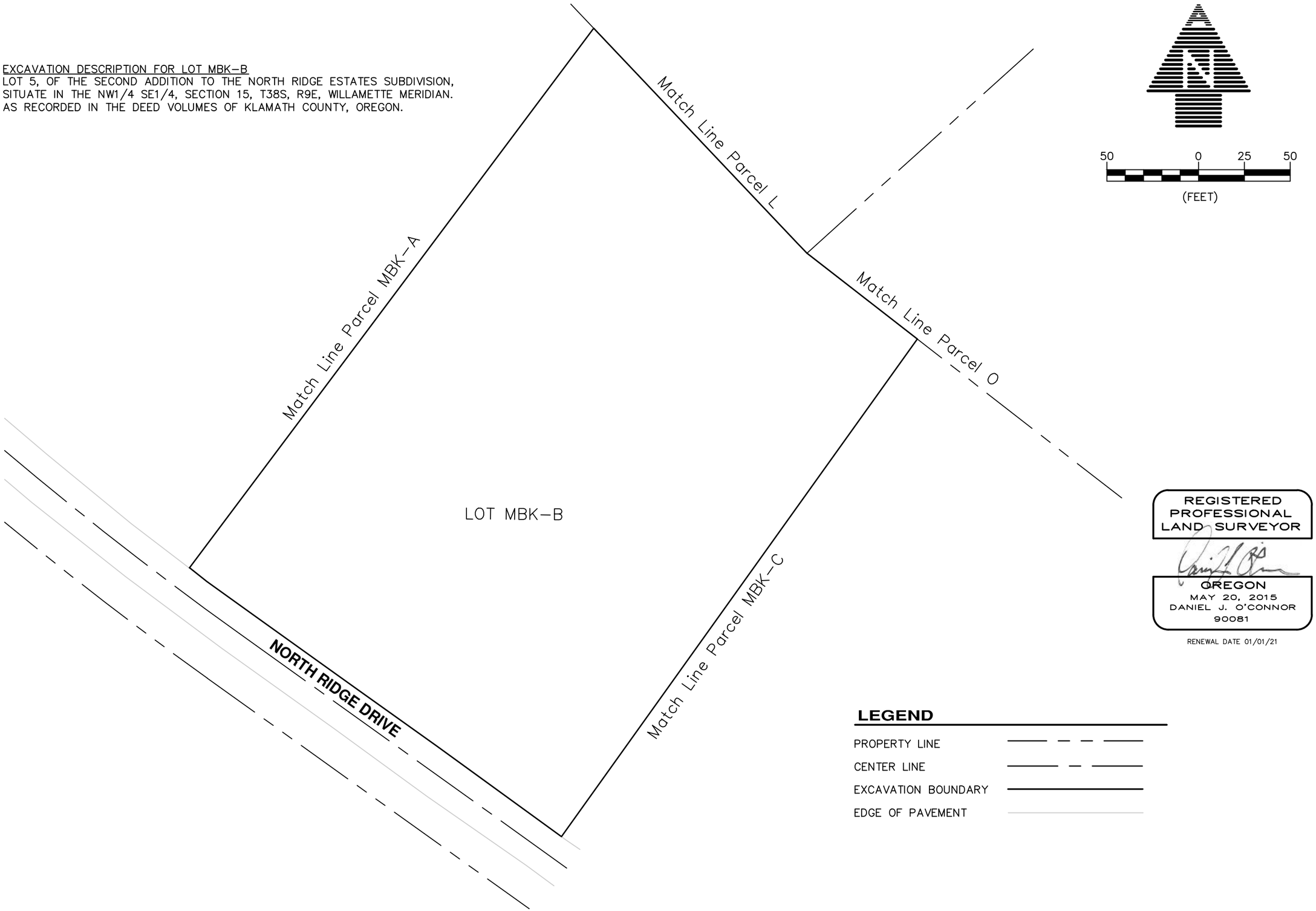
SURVEYED BY:	DNN
SCALE:	AS SJOWM

MBK-B.3

EXCAVATION DESCRIPTION FOR LOT MBK-B
LOT 5, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW1/4 SE1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



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LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-B
LEGAL DESCRIPTION
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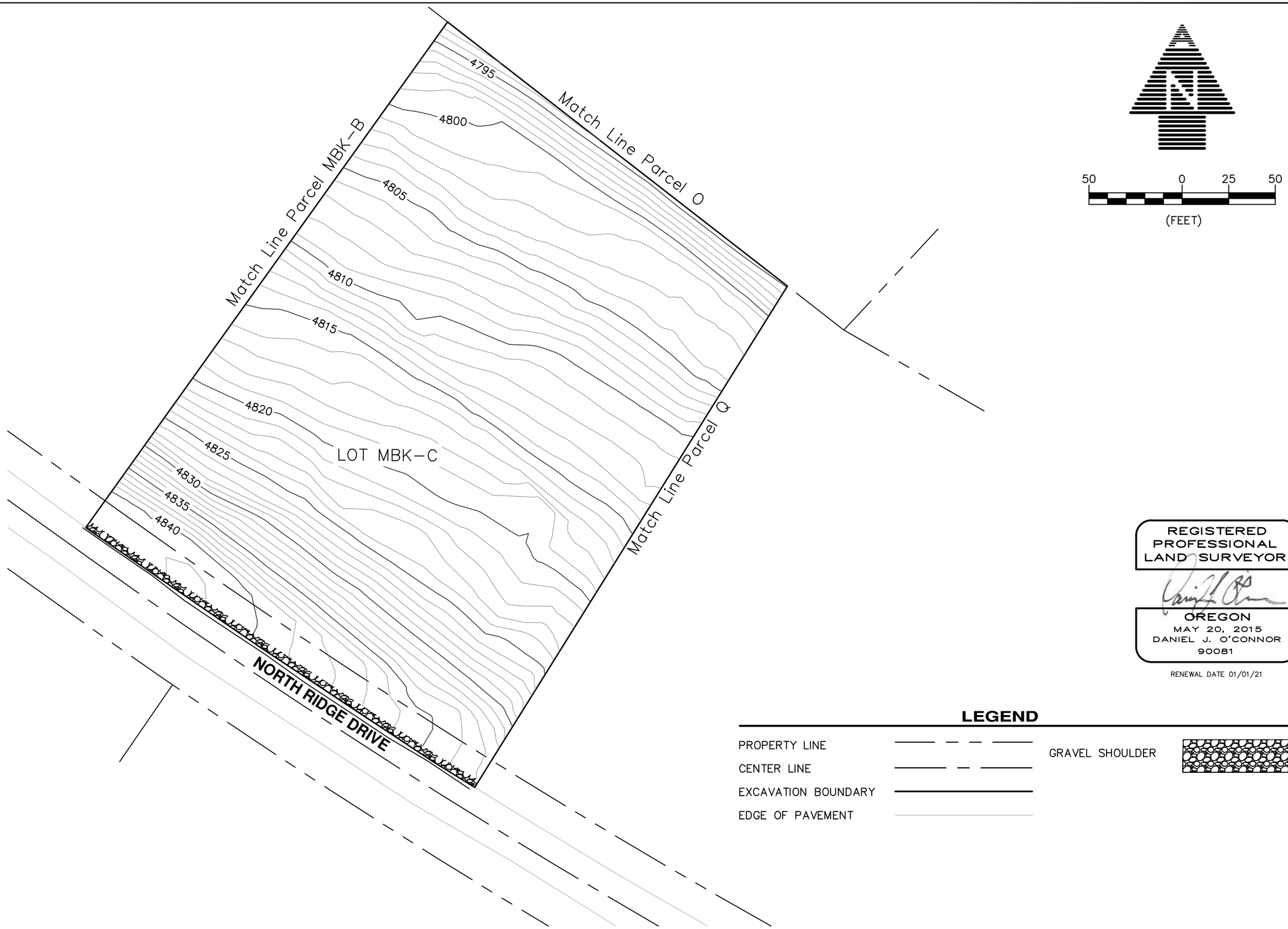
SCALE:	AS SJOWM

MBK-B.4



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LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
GRAVEL SHOULDER

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-C
FINAL LIFT
TOPOGRAPHIC SURVEY

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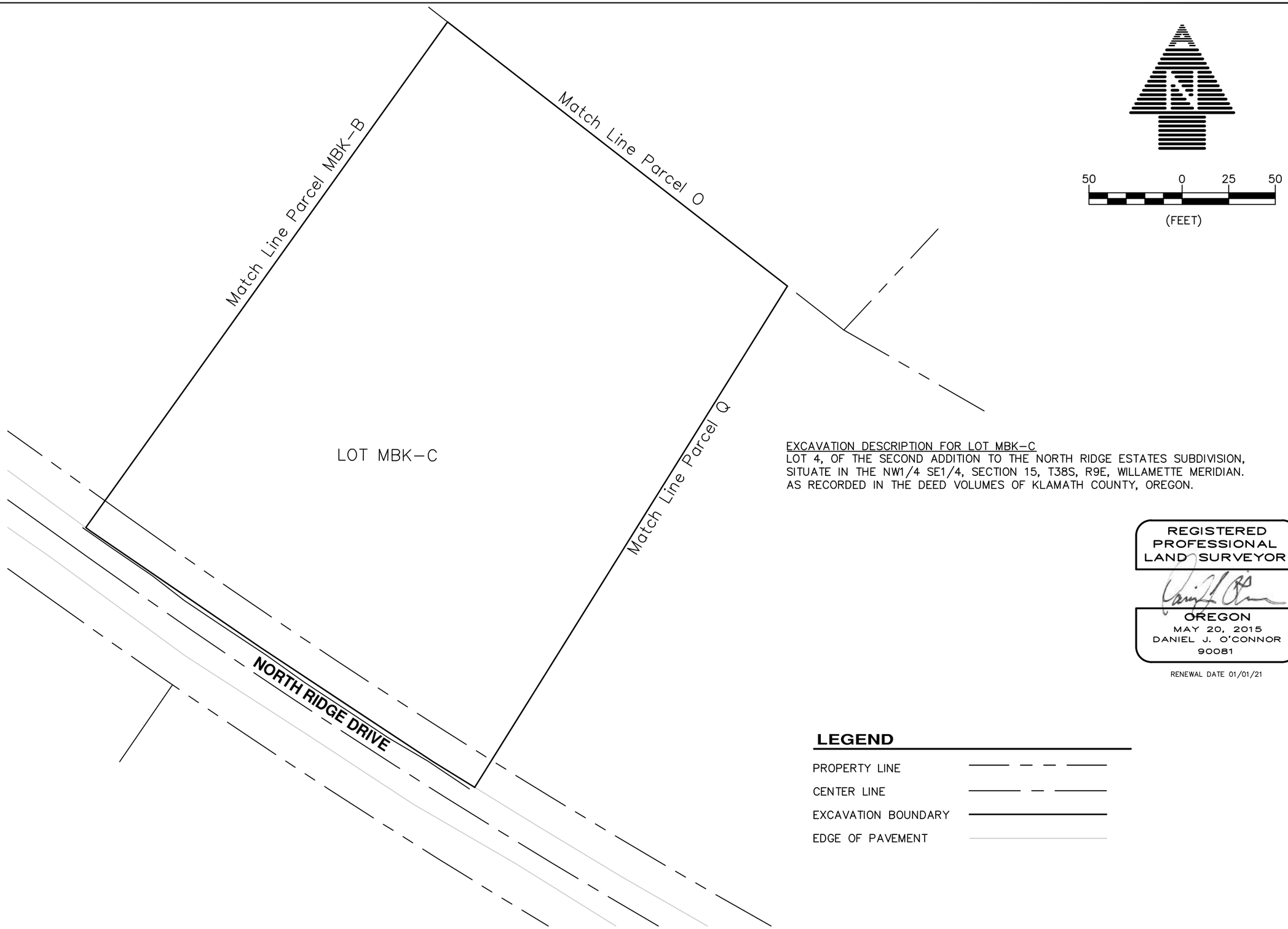
MBK-C.3



EXCAVATION DESCRIPTION FOR LOT MBK-C
LOT 4, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW1/4 SE1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.

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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-C
LEGAL DESCRIPTION
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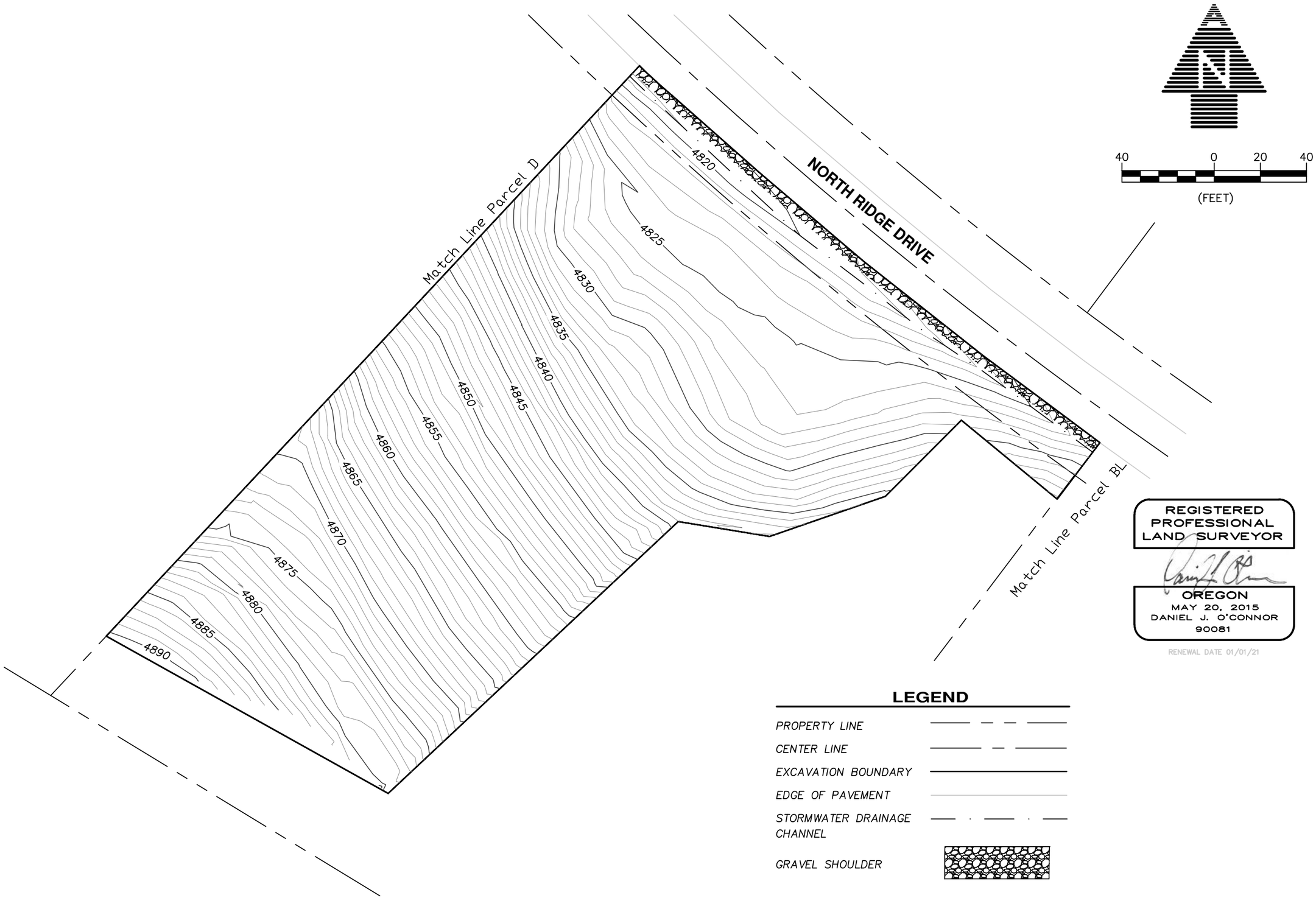
MBK-C.4



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90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	
STORMWATER DRAINAGE CHANNEL	
GRAVEL SHOULDER	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-F
FINAL LIFT
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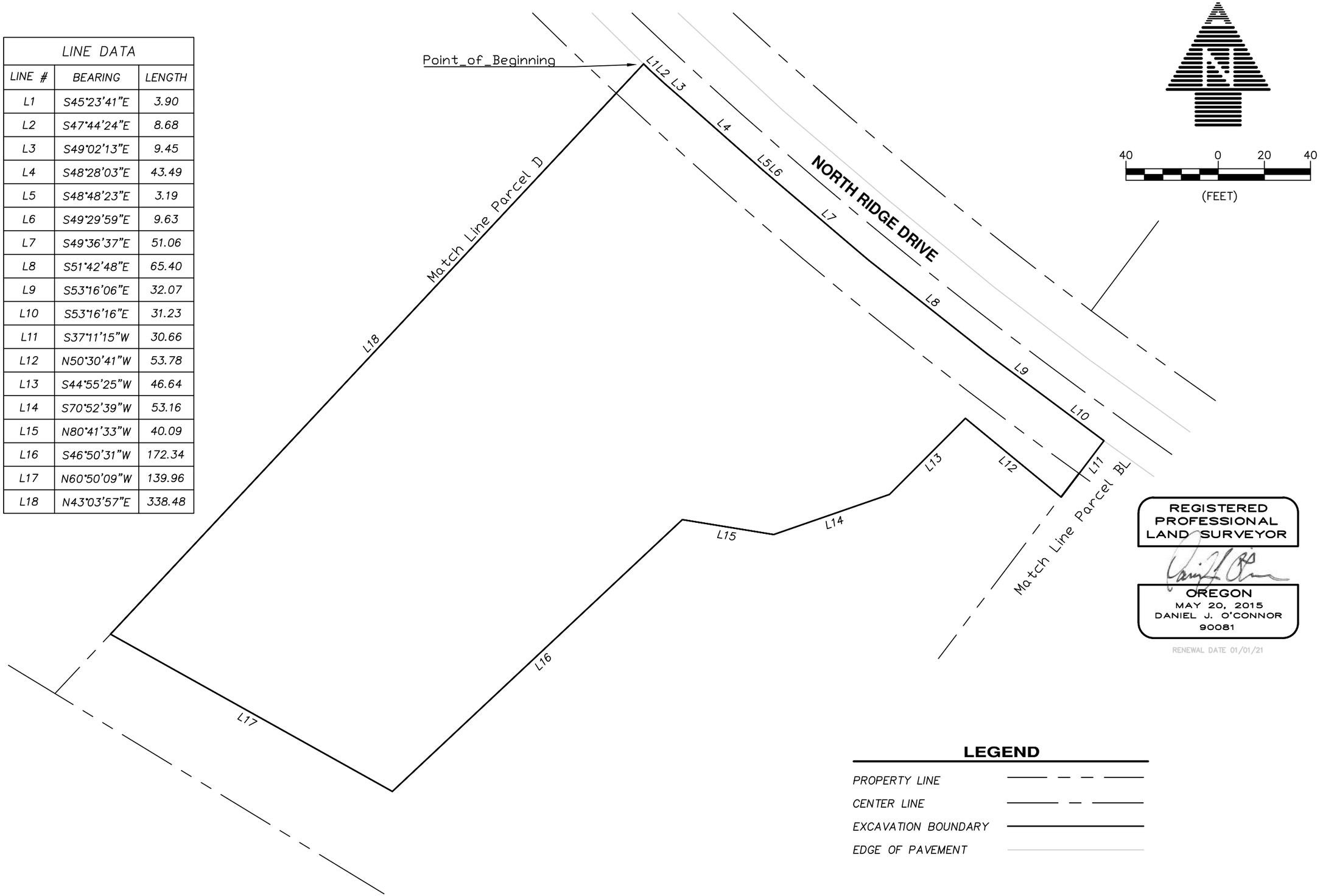
SURVEYED BY:	DNN
SCALE:	AS SHOWN

MBK-F.3

LINE DATA		
LINE #	BEARING	LENGTH
L1	S45°23'41"E	3.90
L2	S47°44'24"E	8.68
L3	S49°02'13"E	9.45
L4	S48°28'03"E	43.49
L5	S48°48'23"E	3.19
L6	S49°29'59"E	9.63
L7	S49°36'37"E	51.06
L8	S51°42'48"E	65.40
L9	S53°16'06"E	32.07
L10	S53°16'16"E	31.23
L11	S37°11'15"W	30.66
L12	N50°30'41"W	53.78
L13	S44°55'25"W	46.64
L14	S70°52'39"W	53.16
L15	N80°41'33"W	40.09
L16	S46°50'31"W	172.34
L17	N60°50'09"W	139.96
L18	N43°03'57"E	338.48



No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-F
LEGAL EXHIBIT
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SCALE:	AS SHOWN

MBK-F.4

EXCAVATION DESCRIPTION FOR LOT MBK–F

A PORTION OF LOT 19, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S03°54'26"W A DISTANCE OF 3176.90 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S45°23'41"E 3.90 FEET
- S47°44'24"E 8.68 FEET
- S49°02'13"E 9.45 FEET
- S48°28'03"E 43.49 FEET
- S48°48'23"E 3.19 FEET
- S49°29'59"E 9.63 FEET
- S49°36'37"E 51.06 FEET
- S51°42'48"E 65.40 FEET
- S53°16'06"E 32.07 FEET
- S53°16'16"E 31.23 FEET
- S37°11'15"W 30.66 FEET
- N50°30'41"W 53.78 FEET
- S44°55'25"W 46.64 FEET
- S70°52'39"W 53.16 FEET
- N80°41'33"W 40.09 FEET
- S46°50'31"W 172.34 FEET
- N60°50'09"W 139.96 FEET
- N43°03'57"E 338.48 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N03°30'35"W A DISTANCE OF 2137.98 FEET FROM THE ¼ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 2.11 ACRES, MORE OR LESS.

40 0 20 40

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT MBK-F

LEGAL DESCRIPTION

TOPOGRAPHIC SURVEY

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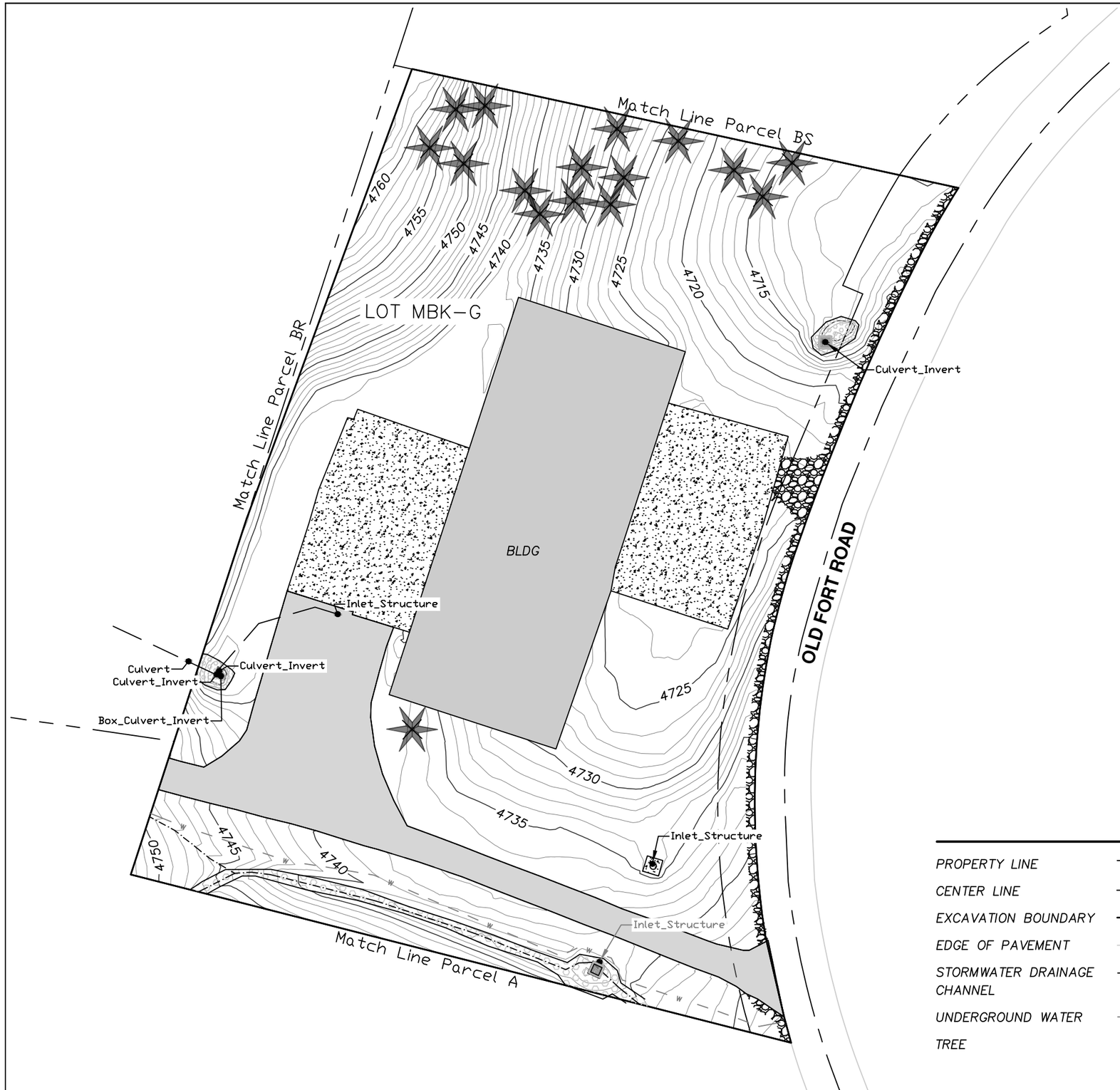
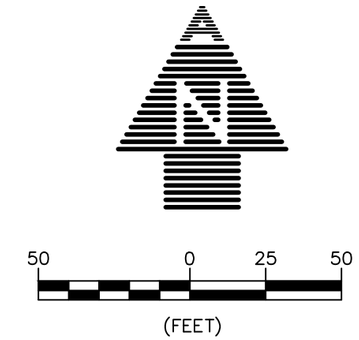
SCALE:	AS SHOWN

MBK-F.5





REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE		ASPHALT	
CENTER LINE		CONCRETE	
EXCAVATION BOUNDARY		OVERSIZE MATERIAL	
EDGE OF PAVEMENT		GRAVEL SHOULDER	
STORMWATER DRAINAGE CHANNEL			
UNDERGROUND WATER			
TREE			

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-G
FINAL LIFT
TOPOGRAPHIC SURVEY

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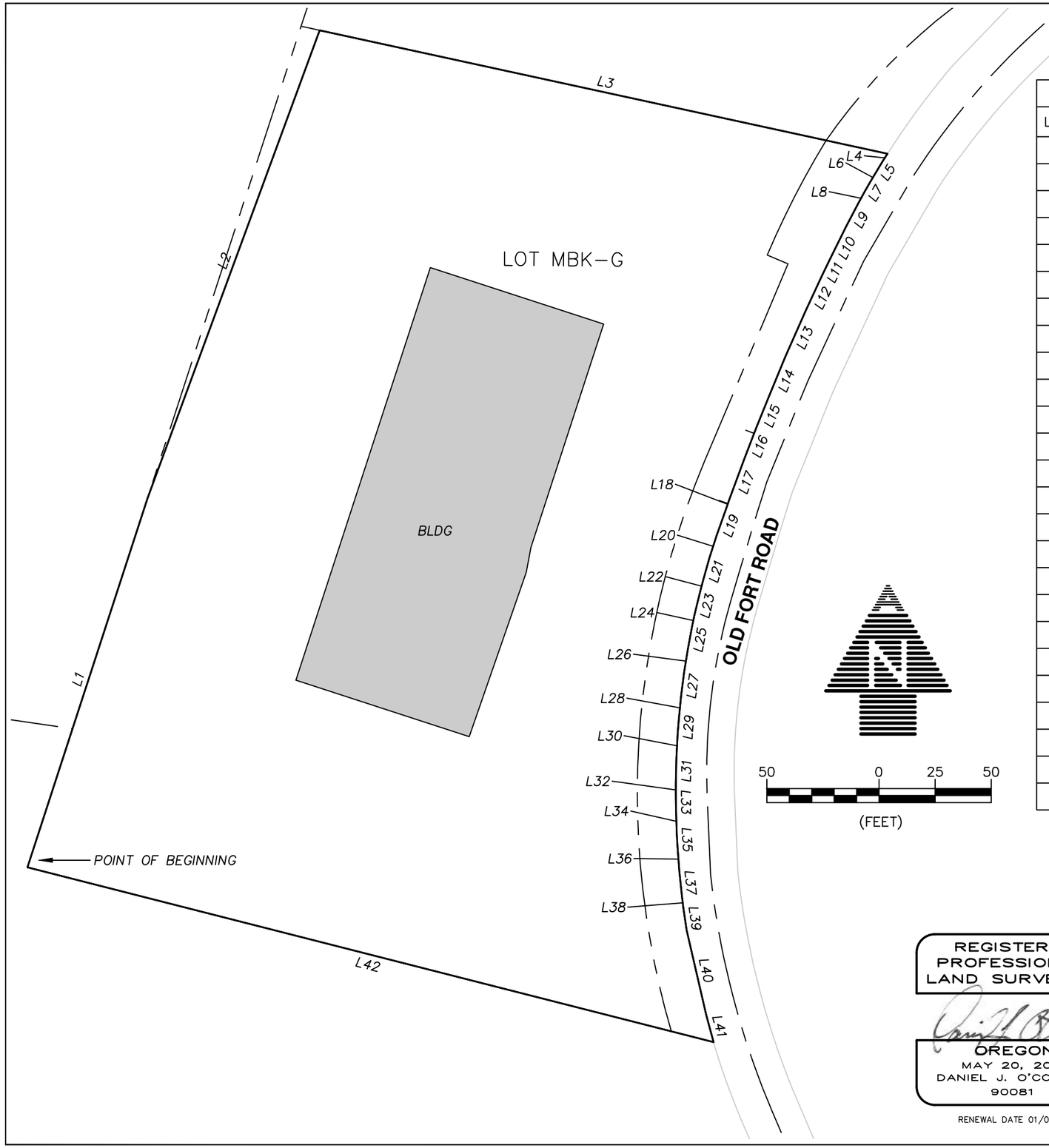
MBK-G.3



Line Table		
Line #	Length	Direction
L1	173.15	N18° 01′ 18″E
L2	222.07	N20° 12′ 11″E
L3	258.97	S77° 43′ 36″E
L4	4.31	S32° 19′ 14″W
L5	5.36	S31° 27′ 59″W
L6	5.36	S30° 36′ 44″W
L7	5.36	S29° 45′ 28″W
L8	5.36	S28° 54′ 13″W
L9	11.68	S27° 26′ 19″W
L10	16.57	S26° 24′ 15″W
L11	8.27	S25° 33′ 46″W
L12	16.57	S25° 01′ 19″W
L13	22.43	S23° 49′ 34″W
L14	19.49	S22° 32′ 38″W
L15	14.63	S21° 44′ 49″W
L16	14.63	S21° 07′ 42″W
L17	19.51	S20° 19′ 57″W
L18	4.86	S19° 21′ 34″W
L19	12.20	S19° 25′ 34″W
L20	10.52	S17° 44′ 05″W
L21	10.52	S15° 59′ 31″W
L22	5.26	S14° 41′ 06″W
L23	10.52	S13° 22′ 41″W
L24	5.26	S12° 04′ 17″W
L25	10.52	S10° 45′ 52″W

Line Table		
Line #	Length	Direction
L26	10.52	S09° 01′ 20″W
L27	10.52	S07° 16′ 48″W
L28	10.52	S05° 32′ 17″W
L29	6.09	S04° 06′ 52″W
L30	11.22	S03° 00′ 14″W
L31	11.22	S01° 22′ 30″W
L32	5.61	S00° 09′ 11″W
L33	5.61	S00° 39′ 43″E
L34	11.22	S01° 53′ 04″E
L35	5.61	S03° 06′ 27″E
L36	11.21	S04° 19′ 50″E
L37	11.21	S05° 57′ 43″E
L38	5.61	S07° 11′ 09″E
L39	9.58	S08° 17′ 30″E
L40	38.77	S13° 00′ 45″E
L41	12.44	S15° 06′ 11″E
L42	315.55	N75° 42′ 28″W

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90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MBK-G
LEGAL DESCRIPTION
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MBK-G.4

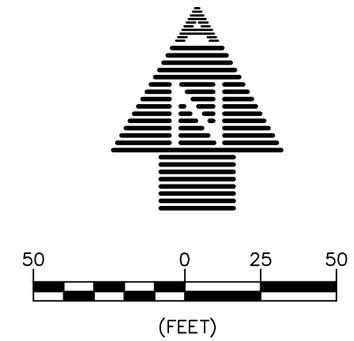
EXCAVATION DESCRIPTION FOR LOT MBK–G

A PORTION OF PARCEL 2 OF LAND PARTITION 44–93, AS RECORDED IN THE KLAMATH COUNTY, OREGON ,RECORDS, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S04°56'08"W A DISTANCE OF 1915.76 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 10 AND 15 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N18° 01' 18"E 173.15 FEET
- N20° 12' 11"E 222.07 FEET
- S77° 43' 36"E 258.97 FEET
- S32° 19' 14"W 4.31 FEET
- S31° 27' 59"W 5.36 FEET
- S30° 36' 44"W 5.36 FEET
- S29° 45' 28"W 5.36 FEET
- S28° 54' 13"W 5.36 FEET
- S27° 26' 19"W 11.68 FEET
- S26° 24' 15"W 16.57 FEET
- S25° 33' 46"W 8.27 FEET
- S25° 01' 19"W 16.57 FEET
- S23° 49' 34"W 22.43 FEET
- S22° 32' 38"W 19.49 FEET
- S21° 44' 49"W 14.63 FEET
- S21° 07' 42"W 14.63 FEET
- S20° 19' 57"W 19.51 FEET
- S19° 21' 34"W 4.86 FEET
- S19° 25' 34"W 12.20 FEET
- S17° 44' 05"W 10.52 FEET
- S15° 59' 31"W 10.52 FEET
- S14° 41' 06"W 5.26 FEET
- S13° 22' 41"W 10.52 FEET
- S12° 04' 17"W 5.26 FEET
- S10° 45' 52"W 10.52 FEET
- S09° 01' 20"W 10.52 FEET
- S07° 16' 48"W 10.52 FEET
- S05° 32' 17"W 10.52 FEET
- S04° 06' 52"W 6.09 FEET
- S03° 00' 14"W 11.22 FEET
- S01° 22' 30"W 11.22 FEET
- S00° 09' 11"W 5.61 FEET
- S00° 39' 43"E 5.61 FEET
- S01° 53' 04"E 11.22 FEET
- S03° 06' 27"E 5.61 FEET
- S04° 19' 50"E 11.21 FEET
- S05° 57' 43"E 11.21 FEET
- S07° 11' 09"E 5.61 FEET
- S08° 17' 30"E 9.58 FEET
- S13° 00' 45"E 38.77 FEET
- S15° 06' 11"E 12.44 FEET
- N75° 42' 28"W 315.55 FEET

TO THE POINT OF BEGINNING WHICH ALSO BEARS N01°19'56"W DISTANCE OF 3395.91 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 2.15 ACRES, MORE OR LESS.



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NORTH RIDGE ESTATES SUPERFUND SITE

LOT MBK-G

LEGAL DESCRIPTION

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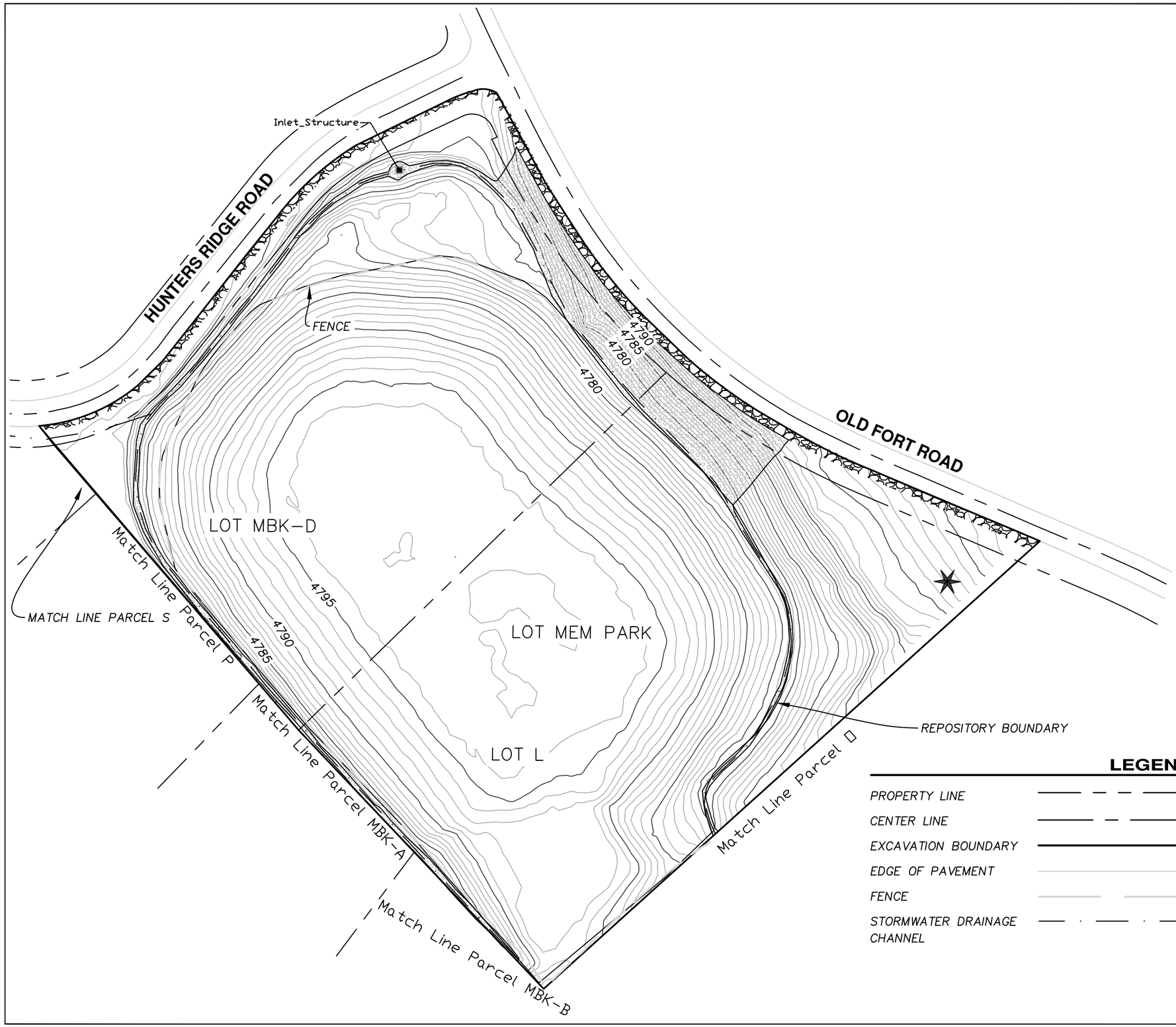
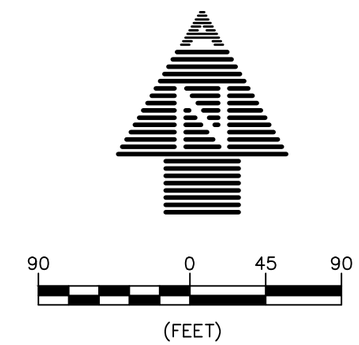
MBK–G.5





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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	
FENCE	
STORMWATER DRAINAGE CHANNEL	
TREE	
OVERSIZED MATERIAL	
GRAVEL SHOULDER	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT MEMORIAL PARK
FINAL LIFT
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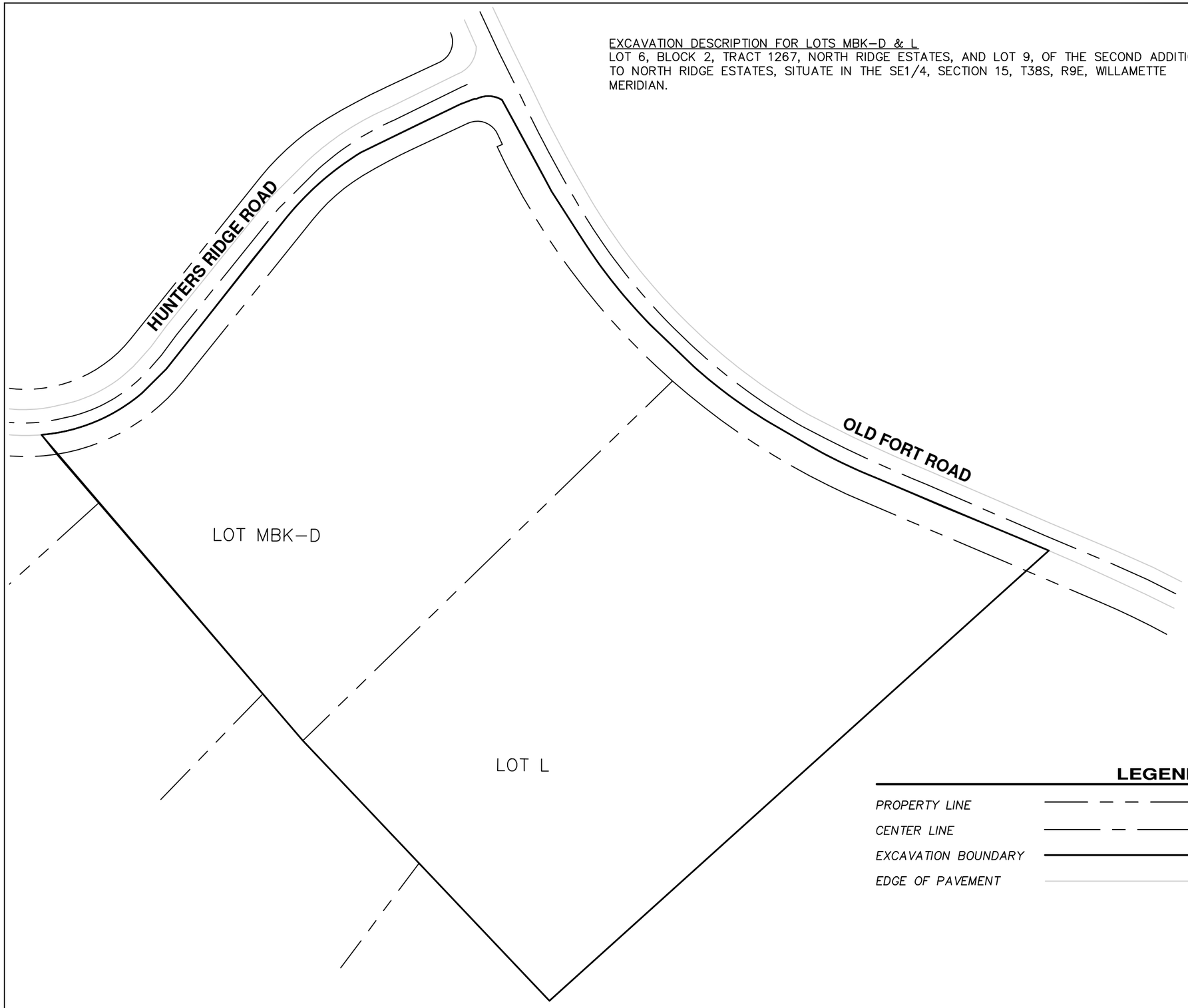
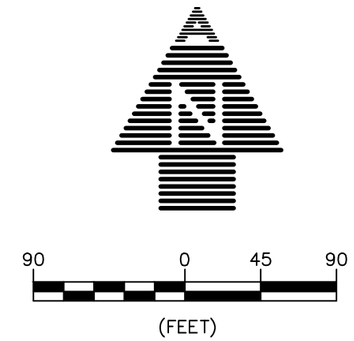
SCALE:	AS SHOWN

MEM PARK.3

EXCAVATION DESCRIPTION FOR LOTS MBK–D & L

LOT 6, BLOCK 2, TRACT 1267, NORTH RIDGE ESTATES, AND LOT 9, OF THE SECOND ADDITION TO NORTH RIDGE ESTATES, SITUATE IN THE SE1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN.





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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT MEMORIAL PARK

LEGAL EXHIBIT

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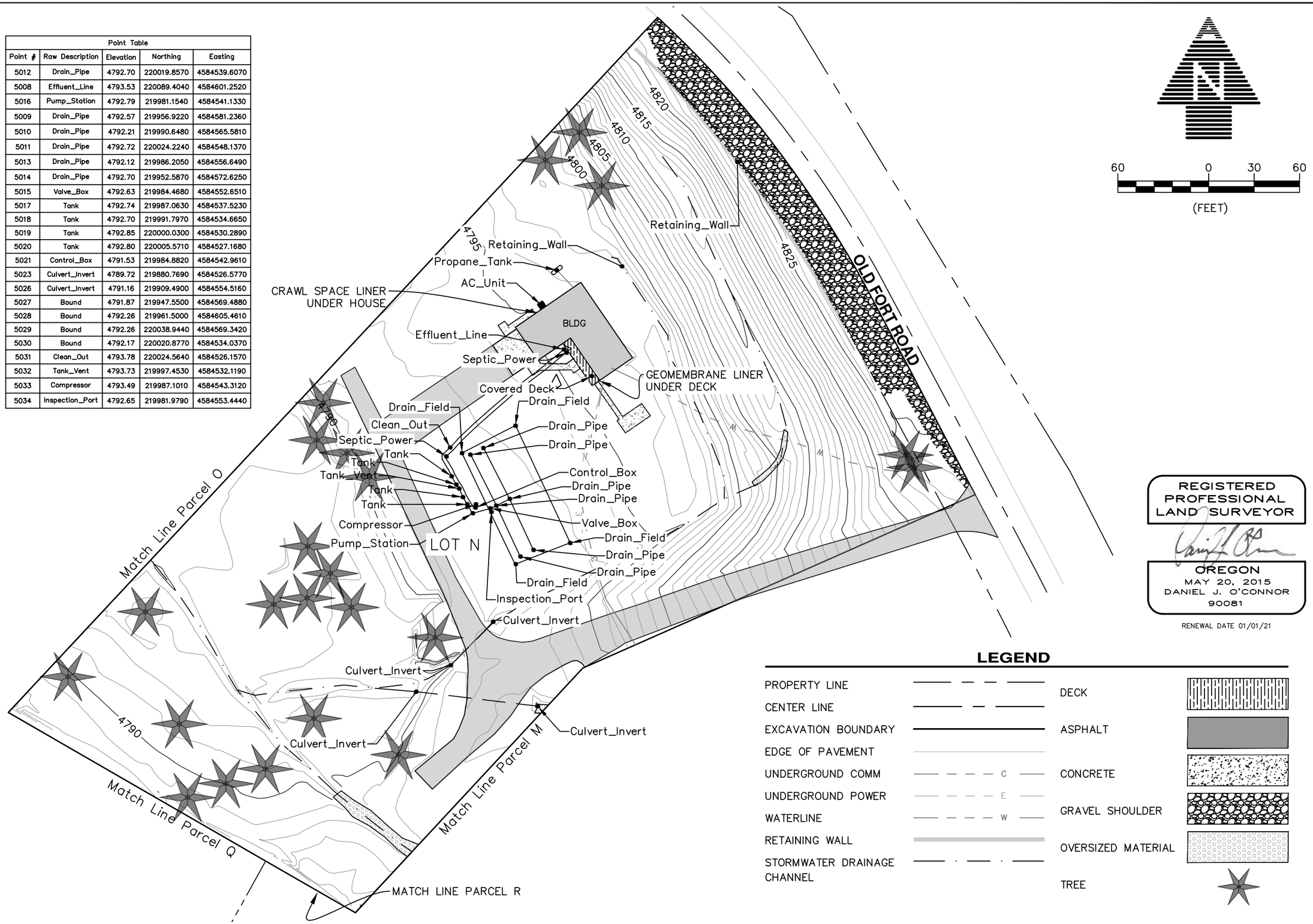
SCALE:	AS SHOWN

MEM PARK.4

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
5012	Drain_Pipe	4792.70	220019.8570	4584539.6070
5008	Effluent_Line	4793.53	220089.4040	4584601.2520
5016	Pump_Station	4792.79	219981.1540	4584541.1330
5009	Drain_Pipe	4792.57	219956.9220	4584581.2360
5010	Drain_Pipe	4792.21	219990.6480	4584565.5810
5011	Drain_Pipe	4792.72	220024.2240	4584548.1370
5013	Drain_Pipe	4792.12	219986.2050	4584556.6490
5014	Drain_Pipe	4792.70	219952.5870	4584572.6250
5015	Valve_Box	4792.63	219984.4680	4584552.6510
5017	Tank	4792.74	219987.0630	4584537.5230
5018	Tank	4792.70	219991.7970	4584534.6650
5019	Tank	4792.85	220000.0300	4584530.2890
5020	Tank	4792.80	220005.5710	4584527.1680
5021	Control_Box	4791.53	219984.8820	4584542.9610
5023	Culvert_Invert	4789.72	219880.7690	4584526.5770
5026	Culvert_Invert	4791.16	219909.4900	4584554.5160
5027	Bound	4791.87	219947.5500	4584569.4880
5028	Bound	4792.26	219961.5000	4584605.4610
5029	Bound	4792.26	220038.9440	4584569.3420
5030	Bound	4792.17	220020.8770	4584534.0370
5031	Clean_Out	4793.78	220024.5640	4584526.1570
5032	Tank_Vent	4793.73	219997.4530	4584532.1190
5033	Compressor	4793.49	219987.1010	4584543.3120
5034	Inspection_Port	4792.65	219981.9790	4584553.4440



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LEGEND

PROPERTY LINE	DECK
CENTER LINE	
EXCAVATION BOUNDARY	ASPHALT
EDGE OF PAVEMENT	
UNDERGROUND COMM — C —	CONCRETE
UNDERGROUND POWER — E —	
WATERLINE — W —	GRAVEL SHOULDER
RETAINING WALL	OVERSIZED MATERIAL
STORMWATER DRAINAGE CHANNEL	TREE

No.	REVISION	DATE	BY

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LOT N
FINAL LIFT
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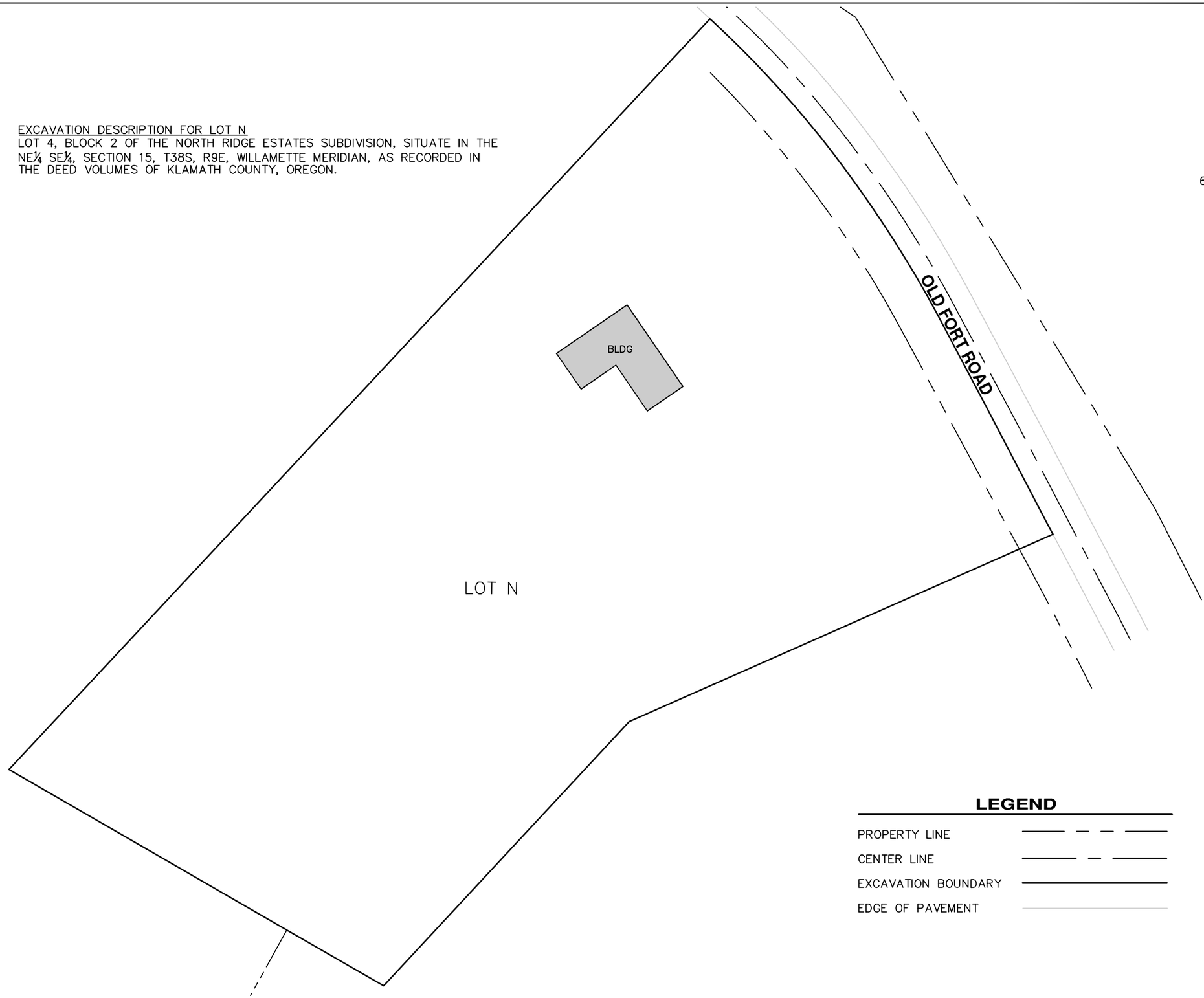
N.3

EXCAVATION DESCRIPTION FOR LOT N

LOT 4, BLOCK 2 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NE¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



60 0 30 60

(FEET)

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LEGEND

PROPERTY LINE

CENTER LINE

EXCAVATION BOUNDARY

EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT N

LEGAL DESCRIPTION

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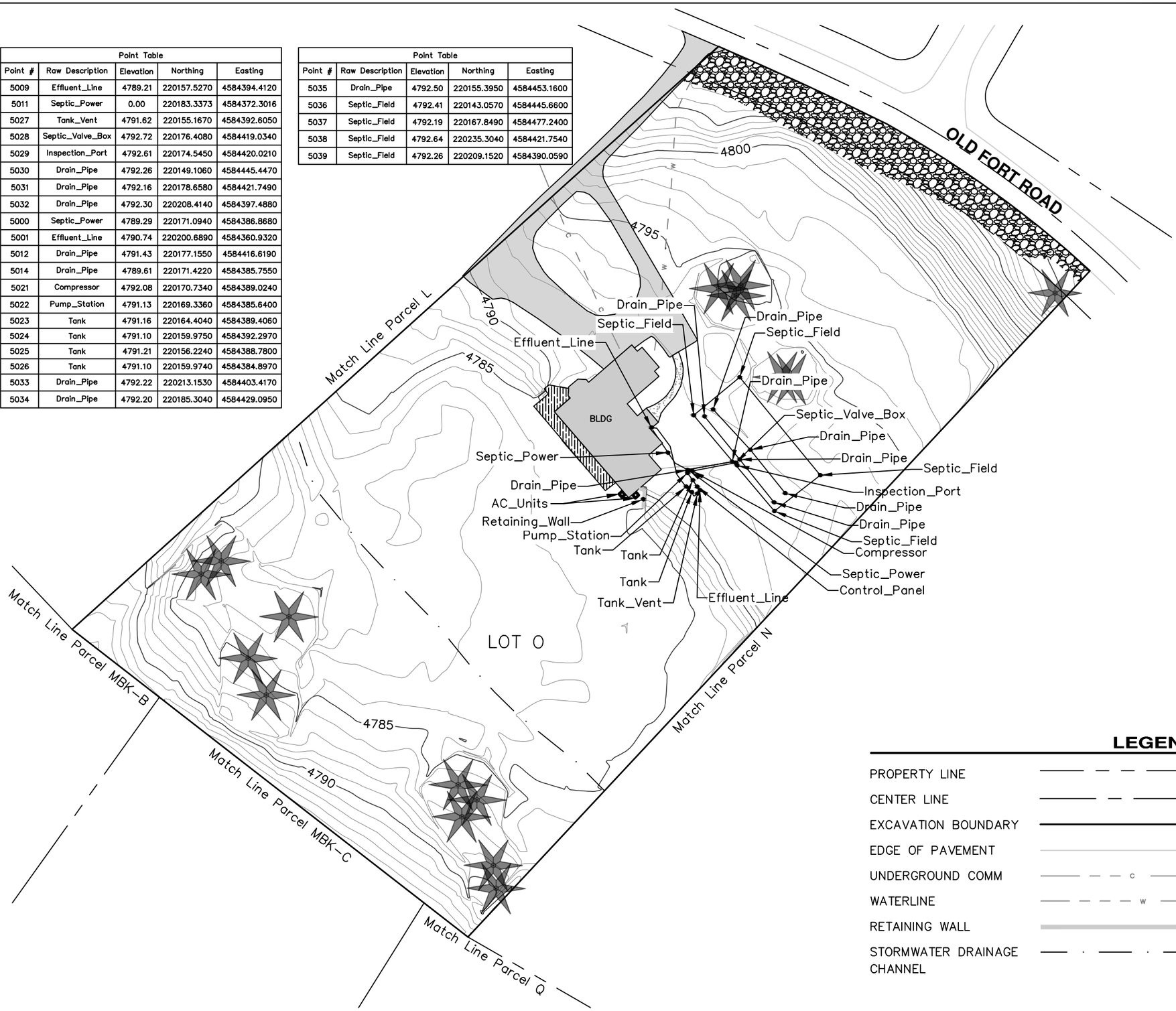
SCALE:	AS SHOWN

N.4

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
5009	Effluent_Line	4789.21	220157.5270	4584394.4120
5011	Septic_Power	0.00	220183.3373	4584372.3016
5027	Tank_Vent	4791.62	220155.1670	4584392.6050
5028	Septic_Valve_Box	4792.72	220176.4080	4584419.0340
5029	Inspection_Port	4792.61	220174.5450	4584420.0210
5030	Drain_Pipe	4792.26	220149.1060	4584445.4470
5031	Drain_Pipe	4792.16	220178.6580	4584421.7490
5032	Drain_Pipe	4792.30	220208.4140	4584397.4880
5000	Septic_Power	4789.29	220171.0940	4584386.8680
5001	Effluent_Line	4790.74	220200.6890	4584360.9320
5012	Drain_Pipe	4791.43	220177.1550	4584416.6190
5014	Drain_Pipe	4789.61	220171.4220	4584385.7550
5021	Compressor	4792.08	220170.7340	4584389.0240
5022	Pump_Station	4791.13	220169.3360	4584385.6400
5023	Tank	4791.16	220164.4040	4584389.4060
5024	Tank	4791.10	220159.9750	4584392.2970
5025	Tank	4791.21	220156.2240	4584388.7800
5026	Tank	4791.10	220159.9740	4584384.8970
5033	Drain_Pipe	4792.22	220213.1530	4584403.4170
5034	Drain_Pipe	4792.20	220185.3040	4584429.0950

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
5035	Drain_Pipe	4792.50	220155.3950	4584453.1600
5036	Septic_Field	4792.41	220143.0570	4584445.6600
5037	Septic_Field	4792.19	220167.8490	4584477.2400
5038	Septic_Field	4792.64	220235.3040	4584421.7540
5039	Septic_Field	4792.26	220209.1520	4584390.0590



70' 0 35' 70'

(FEET)

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DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	TREE
CENTER LINE	DECK
EXCAVATION BOUNDARY	ASPHALT
EDGE OF PAVEMENT	CONCRETE
UNDERGROUND COMM	GRAVEL SHOULDER
WATERLINE	
RETAINING WALL	
STORMWATER DRAINAGE CHANNEL	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT O
FINAL LIFT
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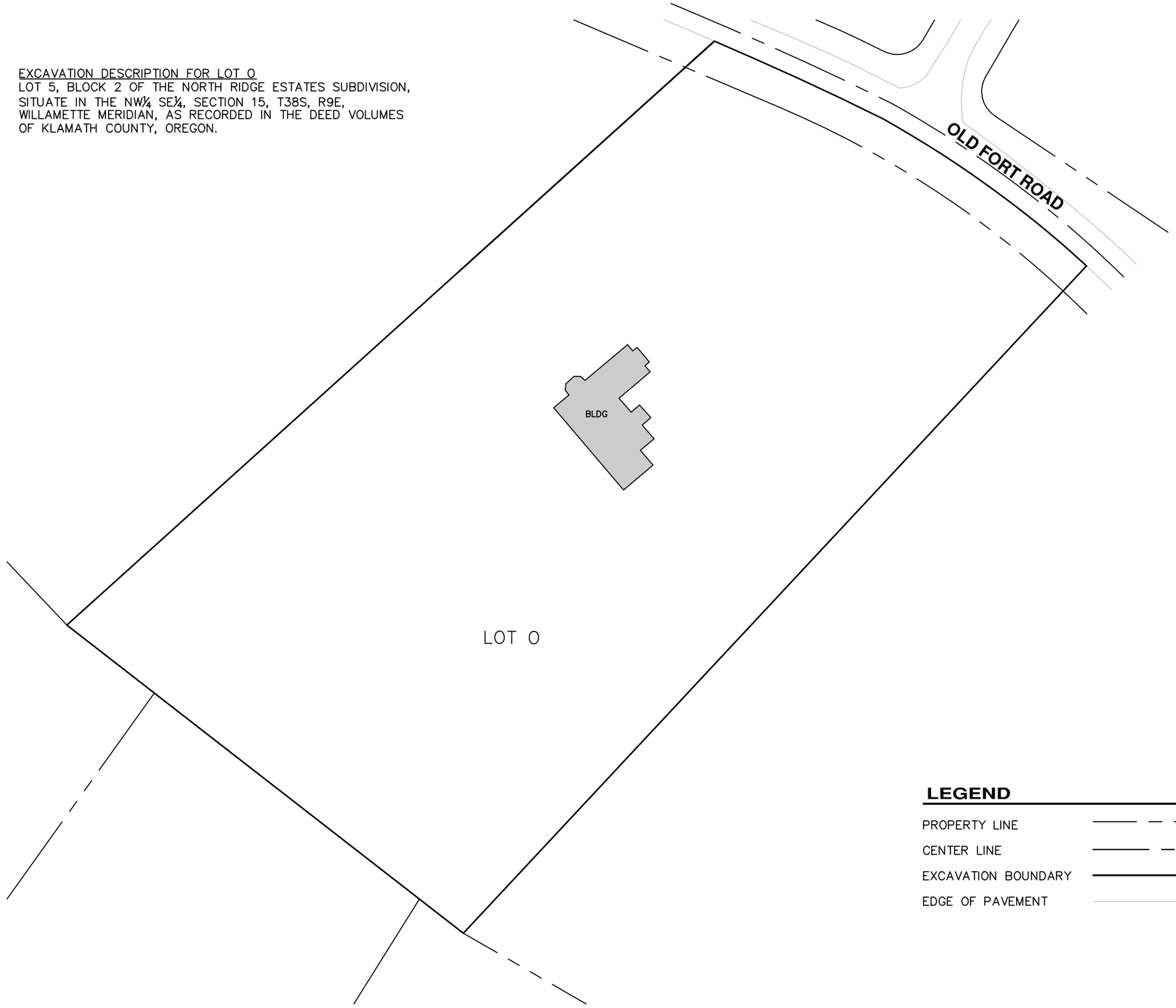
O.3

EXCAVATION DESCRIPTION FOR LOT O

LOT 5, BLOCK 2 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



70' 0 35' 70'

(FEET)

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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

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LOT O

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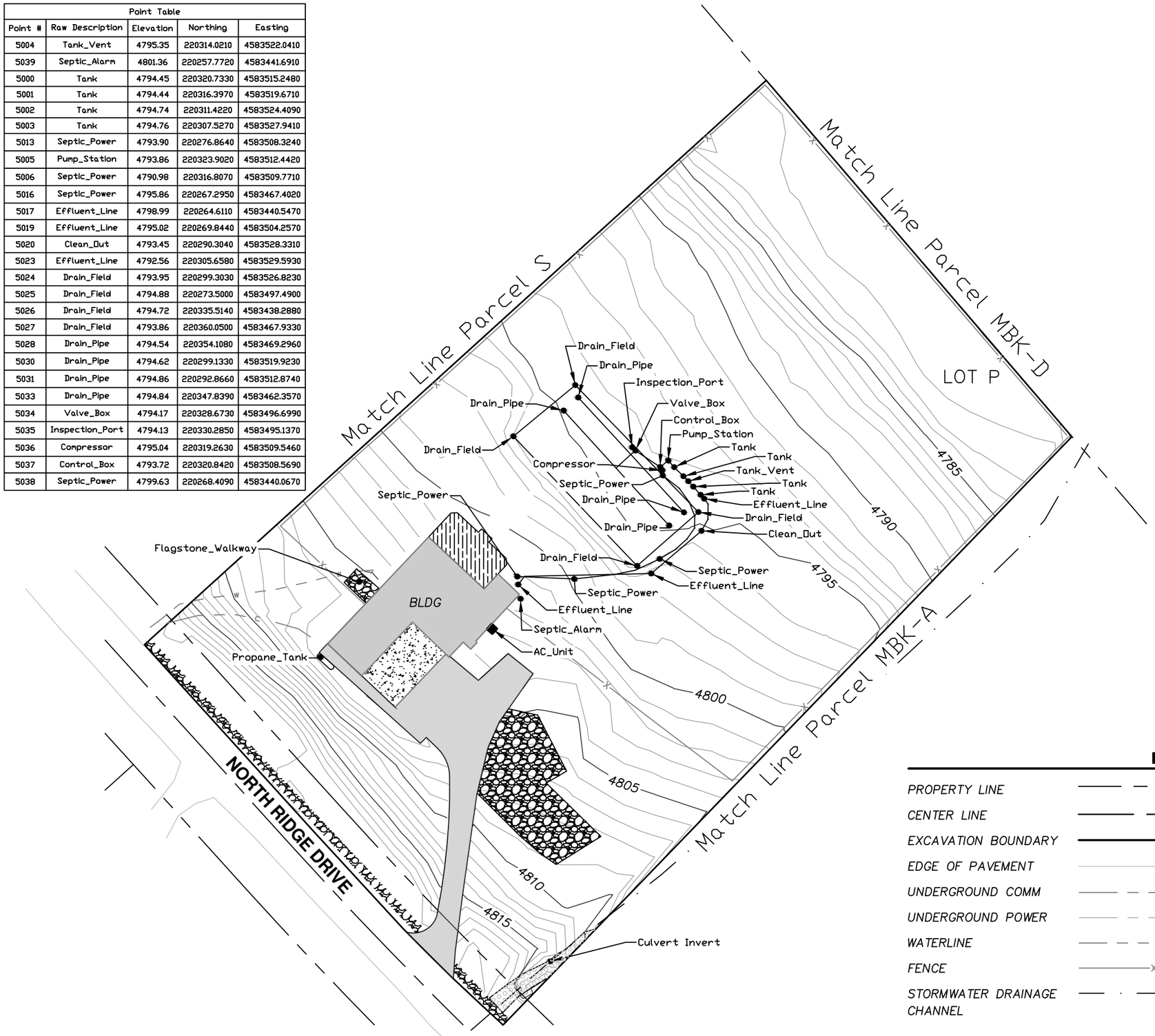
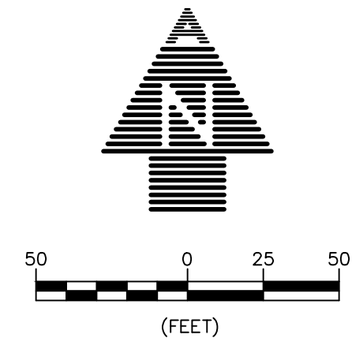
O.4

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
5004	Tank_Vent	4795.35	220314.0210	4583522.0410
5039	Septic_Alarm	4801.36	220257.7720	4583441.6910
5000	Tank	4794.45	220320.7330	4583515.2480
5001	Tank	4794.44	220316.3970	4583519.6710
5002	Tank	4794.74	220311.4220	4583524.4090
5003	Tank	4794.76	220307.5270	4583527.9410
5013	Septic_Power	4793.90	220276.8640	4583508.3240
5005	Pump_Station	4793.86	220323.9020	4583512.4420
5006	Septic_Power	4790.98	220316.8070	4583509.7710
5016	Septic_Power	4795.86	220267.2950	4583467.4020
5017	Effluent_Line	4798.99	220264.6110	4583440.5470
5019	Effluent_Line	4795.02	220269.8440	4583504.2570
5020	Clean_Out	4793.45	220290.3040	4583528.3310
5023	Effluent_Line	4792.56	220305.6580	4583529.5930
5024	Drain_Field	4793.95	220299.3030	4583526.8230
5025	Drain_Field	4794.88	220273.5000	4583497.4900
5026	Drain_Field	4794.72	220335.5140	4583438.2880
5027	Drain_Field	4793.86	220360.0500	4583467.9330
5028	Drain_Pipe	4794.54	220354.1080	4583469.2960
5030	Drain_Pipe	4794.62	220299.1330	4583519.9230
5031	Drain_Pipe	4794.86	220292.8660	4583512.8740
5033	Drain_Pipe	4794.84	220347.8390	4583462.3570
5034	Valve_Box	4794.17	220328.6730	4583496.6990
5035	Inspection_Port	4794.13	220330.2850	4583495.1370
5036	Compressor	4795.04	220319.2630	4583509.5460
5037	Control_Box	4793.72	220320.8420	4583508.5690
5038	Septic_Power	4799.63	220268.4090	4583440.0670





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OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	DECK
CENTER LINE	ASPHALT
EXCAVATION BOUNDARY	CONCRETE
EDGE OF PAVEMENT	OVERSIZED MATERIAL
UNDERGROUND COMM	GRAVEL
UNDERGROUND POWER	
WATERLINE	
FENCE	
STORMWATER DRAINAGE CHANNEL	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT P
FINAL LIFT
TOPOGRAPHIC SURVEY

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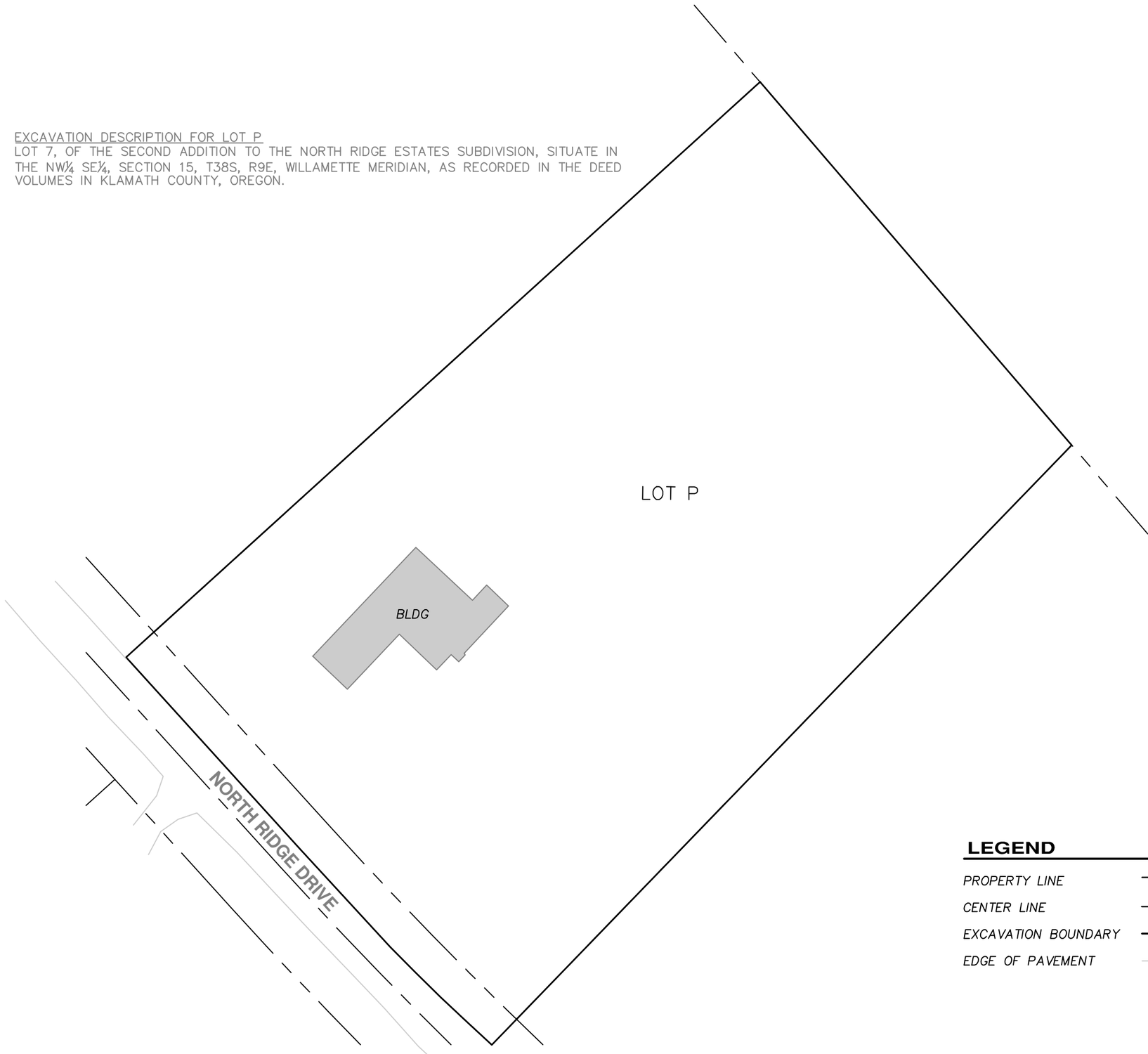
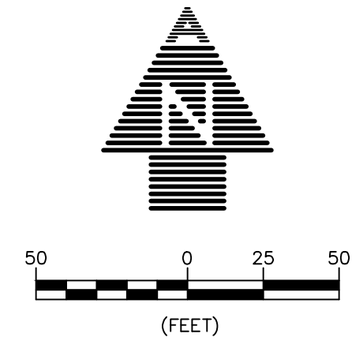
SURVEYED BY:	DNN
SCALE:	AS SHOWN

P.3

EXCAVATION DESCRIPTION FOR LOT P

LOT 7, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES IN KLAMATH COUNTY, OREGON.





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DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT P
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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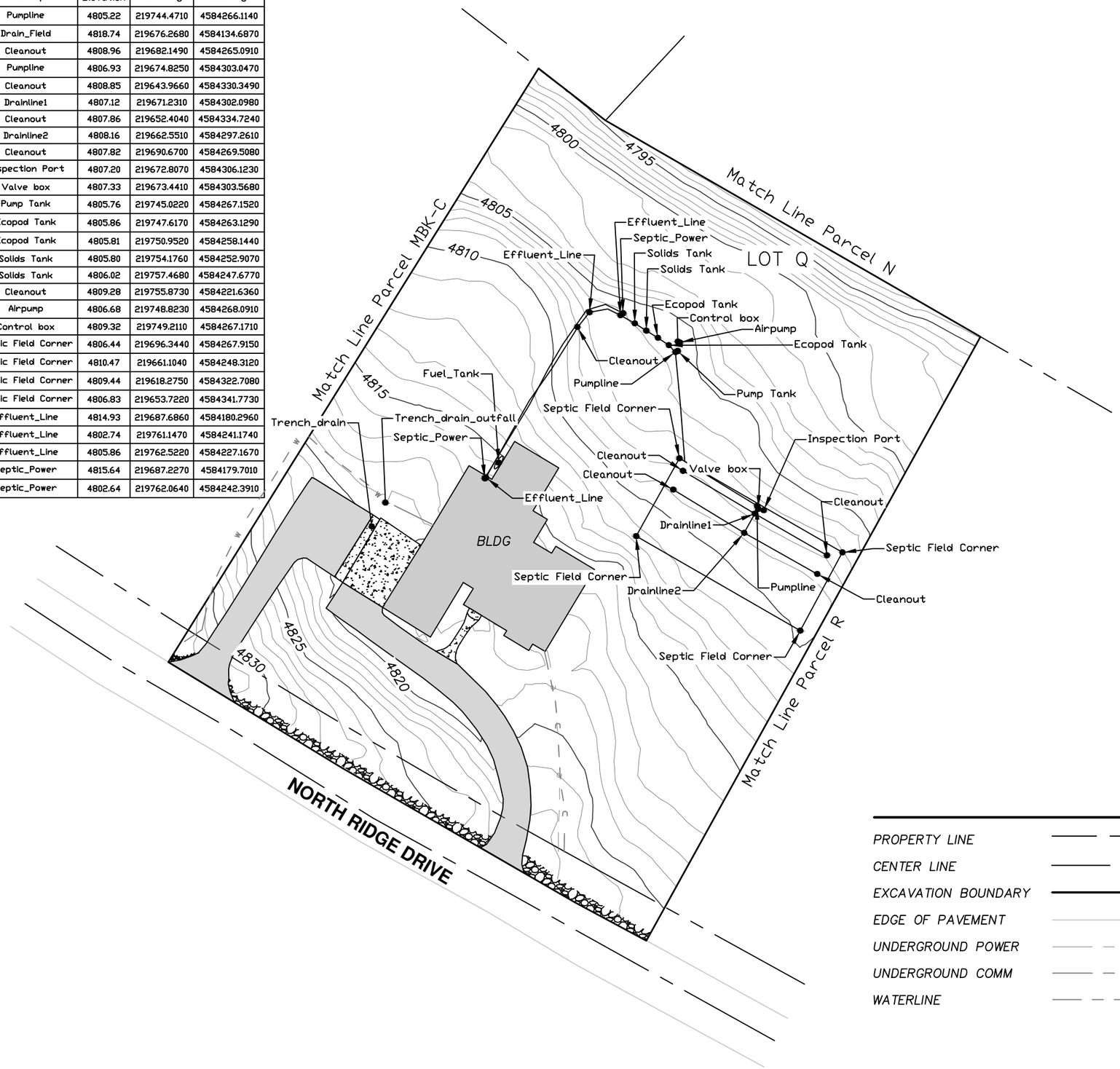
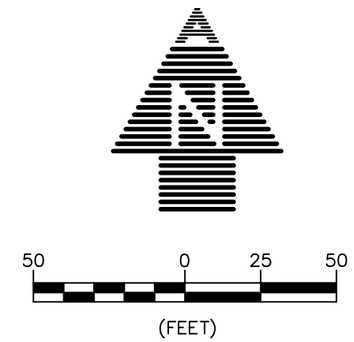
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
12595	Pumpline	4805.22	219744.4710	4584266.1140
7039	Drain_Field	4818.74	219676.2680	4584134.6870
12607	Cleanout	4808.96	219682.1490	4584265.0910
12599	Pumpline	4806.93	219674.8250	4584303.0470
12608	Cleanout	4808.85	219643.9660	4584330.3490
12600	Drainline1	4807.12	219671.2310	4584302.0980
12609	Cleanout	4807.86	219652.4040	4584334.7240
12601	Drainline2	4808.16	219662.5510	4584297.2610
12606	Cleanout	4807.82	219690.6700	4584269.5080
12610	Inspection Port	4807.20	219672.8070	4584306.1230
12611	Valve box	4807.33	219673.4410	4584303.5680
12612	Pump Tank	4805.76	219745.0220	4584267.1520
12613	Ecopod Tank	4805.86	219747.6170	4584263.1290
12614	Ecopod Tank	4805.81	219750.9520	4584258.1440
12615	Solids Tank	4805.80	219754.1760	4584252.9070
12616	Solids Tank	4806.02	219757.4680	4584247.6770
12617	Cleanout	4809.28	219755.8730	4584221.6360
12618	Airpump	4806.68	219748.8230	4584268.0910
12619	Control box	4809.32	219749.2110	4584267.1710
12620	Septic Field Corner	4806.44	219696.3440	4584267.9150
12621	Septic Field Corner	4810.47	219661.1040	4584248.3120
12622	Septic Field Corner	4809.44	219618.2750	4584322.7080
12623	Septic Field Corner	4806.83	219653.7220	4584341.7730
12636	Effluent_Line	4814.93	219687.6860	4584180.2960
12638	Effluent_Line	4802.74	219761.1470	4584241.1740
12640	Effluent_Line	4805.86	219762.5220	4584227.1670
12644	Septic_Power	4815.64	219687.2270	4584179.7010
12649	Septic_Power	4802.64	219762.0640	4584242.3910





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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	
UNDERGROUND POWER	e
UNDERGROUND COMM	c
WATERLINE	w

ASPHALT

CONCRETE

GRAVEL SHOULDER

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT Q
FINAL LIFT
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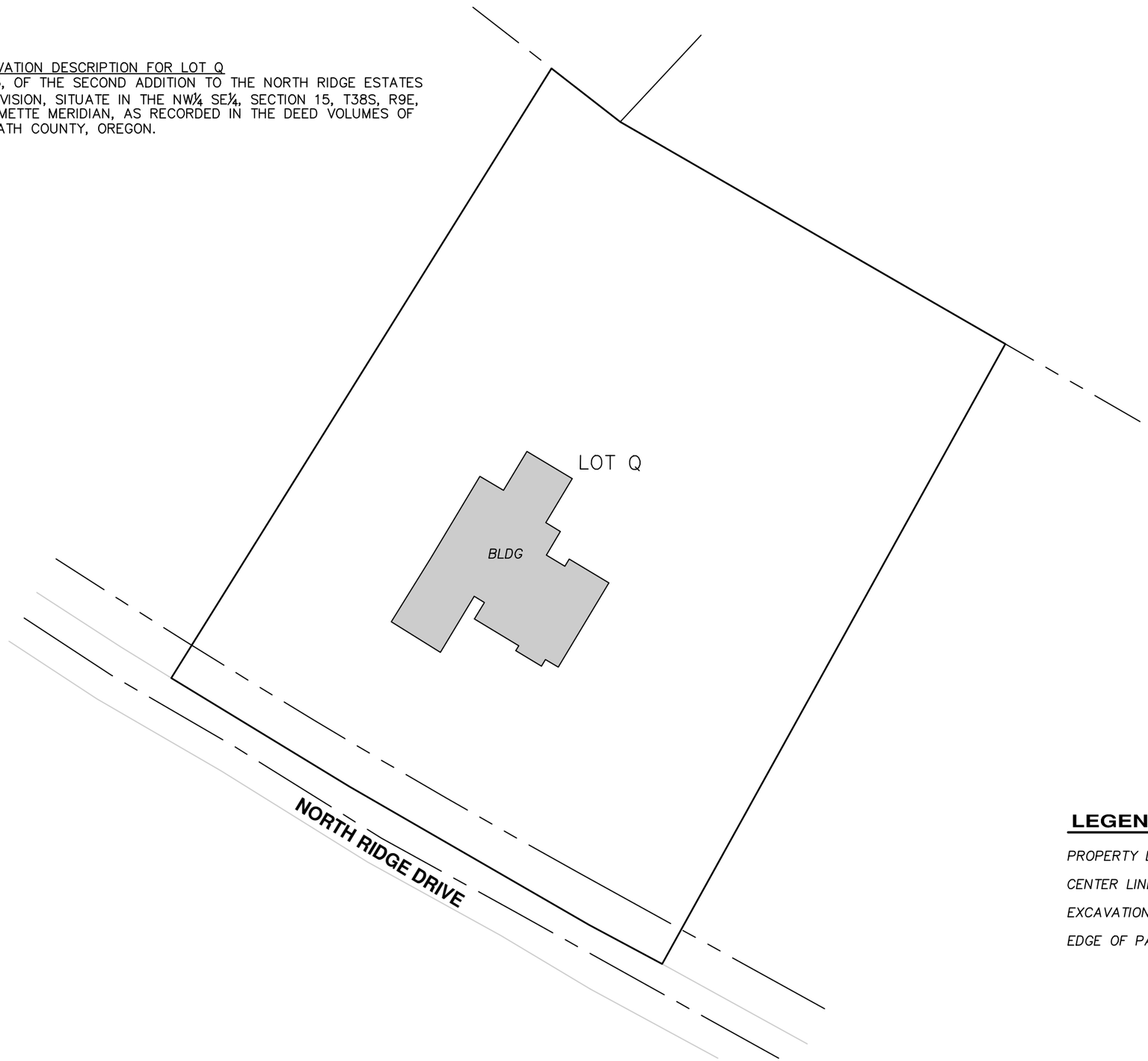
SCALE:	AS SHOWN

Q.3

EXCAVATION DESCRIPTION FOR LOT Q

LOT 3, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



50 0 25 50

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DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT Q

LEGAL DESCRIPTION

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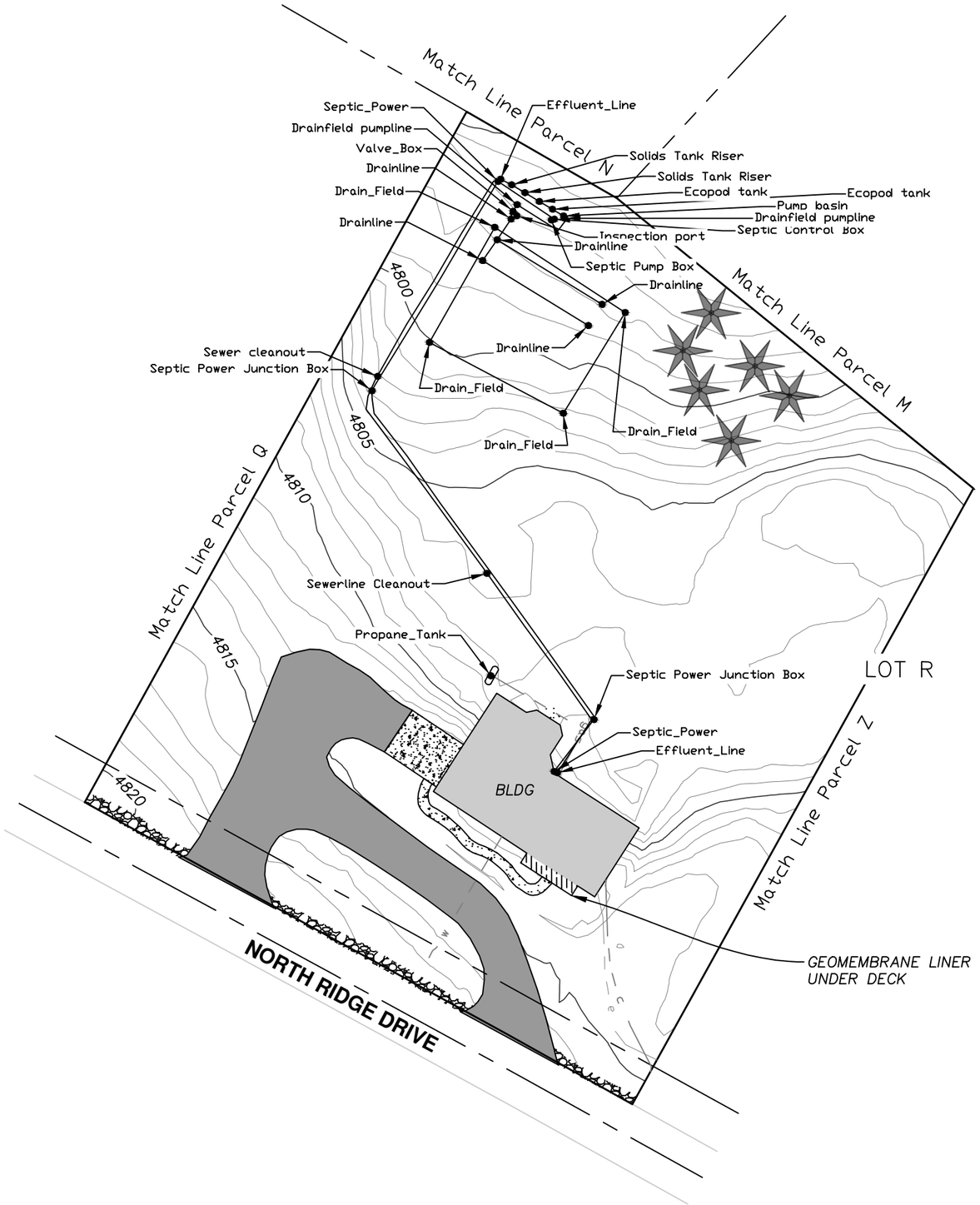
SURVEYED BY:	DNN
SCALE:	AS SHOWN

Q.4



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
11722	Drain_Field	4800.04	219631.9420	4584442.5930
11723	Drain_Field	4798.91	219660.0120	4584389.5650
11724	Drain_Field	4796.47	219705.5950	4584415.4330
11725	Drain_Field	4796.36	219671.8740	4584467.1530
5	Pump basin	4796.58	219710.1240	4584442.7510
11726	Ecopod tank	4796.59	219712.7880	4584438.3370
11727	Ecopod tank	4796.62	219715.8630	4584433.1310
16	Valve_Box	4796.87	219711.9560	4584422.6750
11728	Solids Tank Riser	4796.55	219719.3380	4584427.3910
9	Solids Tank Riser	4796.52	219722.4360	4584422.1690
11729	Septic Pump Box	4797.37	219708.4820	4584437.8440
11730	Septic Control Box	4800.22	219708.8000	4584439.0550
11794	Septic_Power	4804.61	219490.0020	4584438.9400
11734	Inspection port	4796.90	219710.2130	4584424.1690
11736	Drainfield pumpline	4796.06	219714.5660	4584424.2930
11739	Drainfield pumpline	4795.67	219709.1870	4584443.1940
11740	Drainline	4796.60	219708.8790	4584421.8620
11741	Drainline	4797.38	219700.6570	4584416.3720
11742	Drainline	4798.10	219692.4410	4584410.6150
11749	Drainline	4798.22	219666.6980	4584452.5440
11750	Drainline	4797.52	219675.0650	4584457.9950
11752	Sewerline Cleanout	4807.61	219568.5000	4584412.3220
11753	Septic Power Junction Box	4803.02	219640.8460	4584366.7910
11754	Septic Power Junction Box	4807.31	219510.5920	4584454.7330
11755	Sewer cleanout	4803.92	219646.5550	4584369.0660
11764	Effluent_Line	4805.16	219489.5020	4584440.2310
11779	Effluent_Line	4795.18	219724.7120	4584417.7620
11780	Septic_Power	4795.02	219723.8210	4584416.7370

50 0 25 50
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OREGON
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DANIEL J. O'CONNOR
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LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM — c —
UNDERGROUND POWER — e —
UNDERGROUND GAS — gas —
WATERLINE — w —

DECK
ASPHALT
CONCRETE
GRAVEL SHOULDER
TREE

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT R
FINAL LIFT
TOPOGRAPHIC SURVEY

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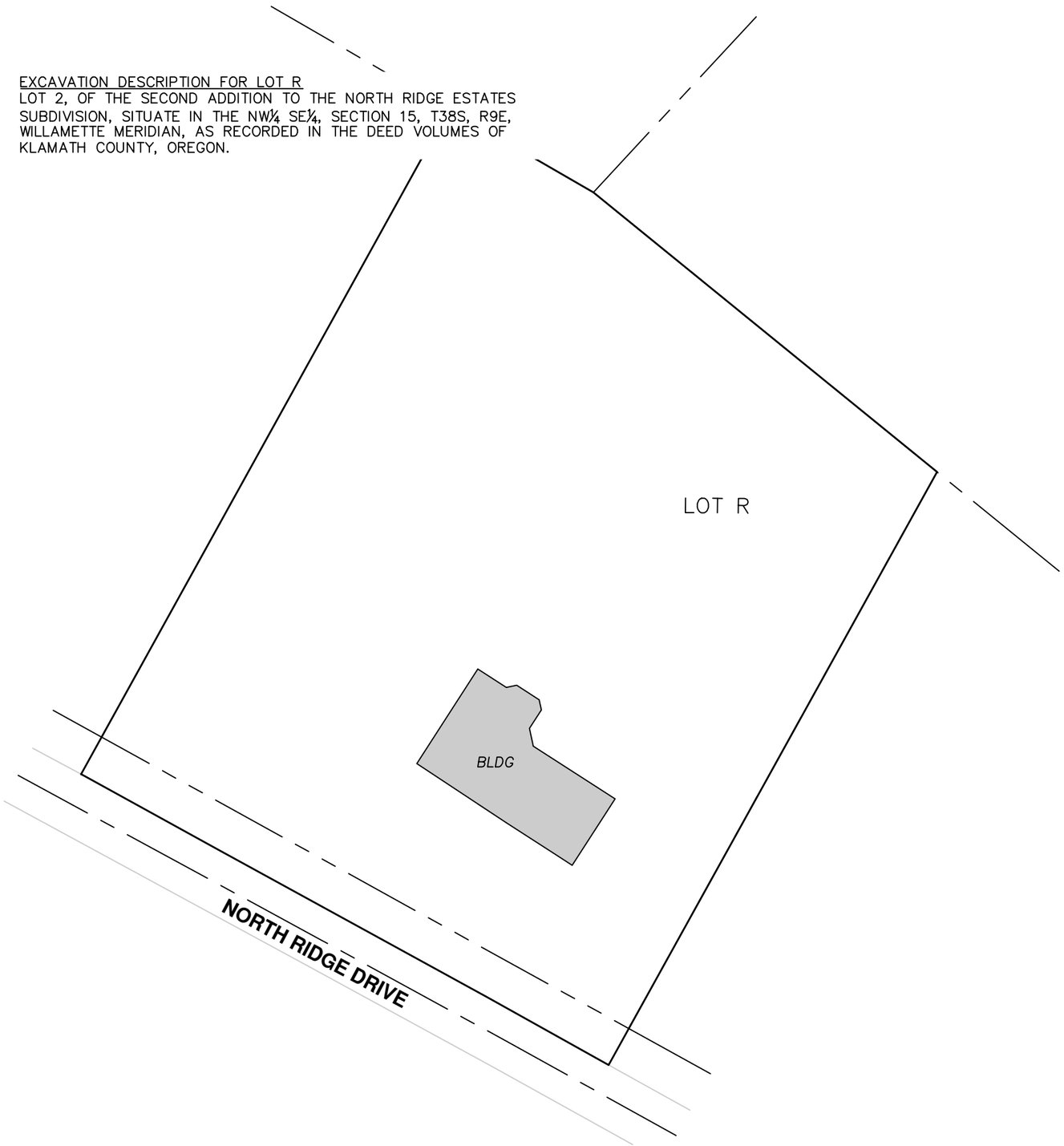
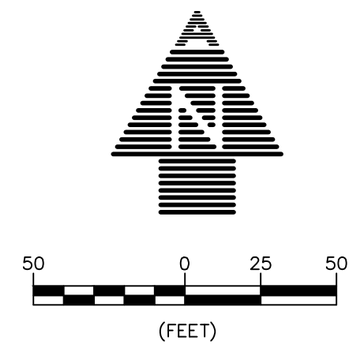
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

R.3

EXCAVATION DESCRIPTION FOR LOT R

LOT 2, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.





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OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT R

LEGAL DESCRIPTION

TOPOGRAPHIC SURVEY

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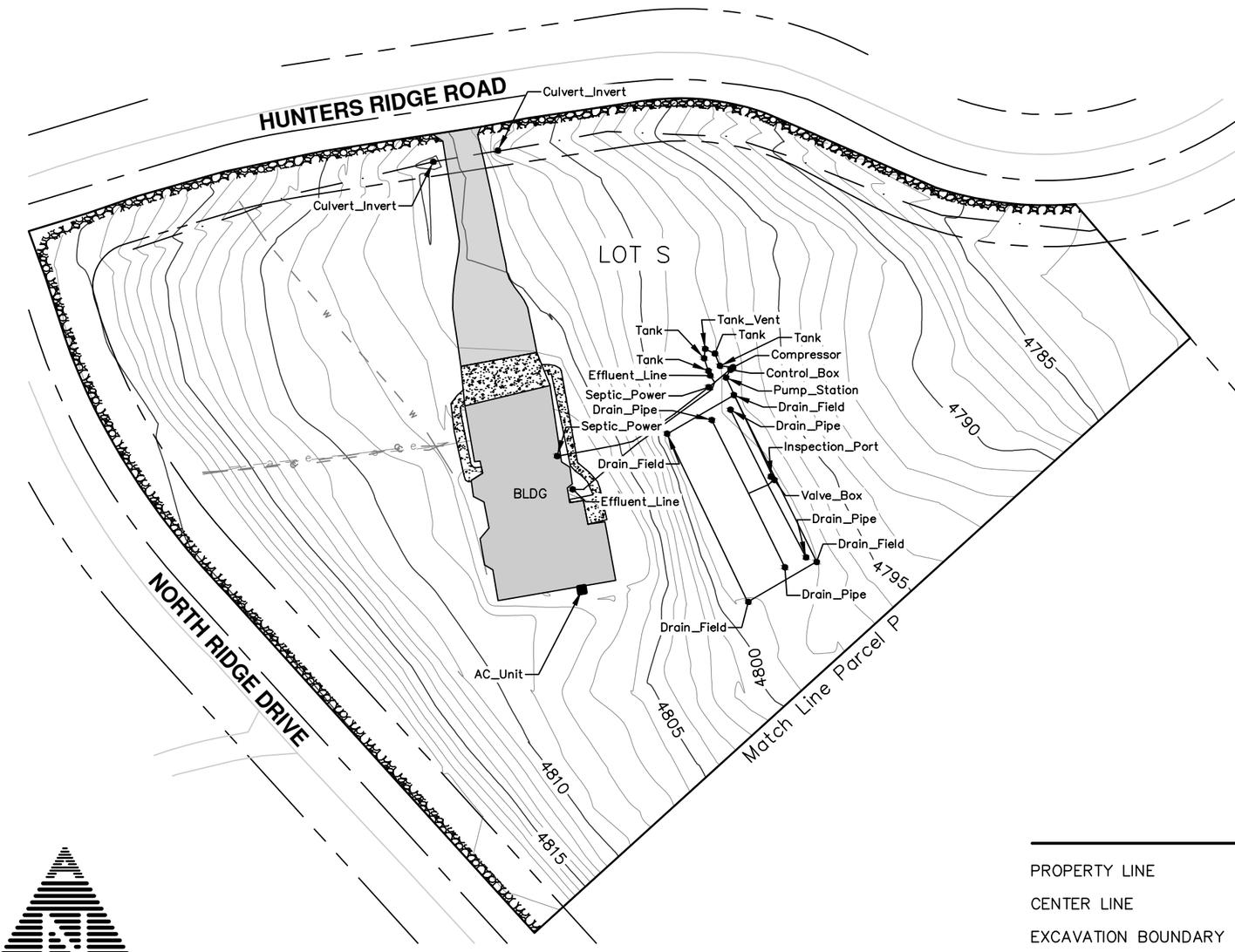
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

R.4



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
11	Culvert_Invert	4803.578	220585.8490	4583215.6620
12	Culvert_Invert	4801.022	220590.8970	4583244.9720
5016	Tank	4798.387	220496.6100	4583338.6430
5000	Effluent_Line	4806.389	220437.1140	4583278.9450
5006	Effluent_Line	4796.808	220488.7960	4583341.4260
5015	Tank	4798.420	220490.8870	4583340.5920
5007	Septic_Power	4806.179	220452.2100	4583271.8710
5013	Septic_Power	4796.308	220483.4520	4583340.6910
5017	Tank	4798.257	220498.7250	4583343.4850
5018	Tank	4798.265	220493.1480	4583345.8210
5019	Pump_Station	4798.232	220487.8660	4583348.5530
5020	Control_Box	4796.101	220491.4240	4583350.5970
5021	Tank_Vent	4798.871	220500.8530	4583339.0640
5022	Compressor	4798.738	220492.5760	4583351.8470
5023	Drain_Field	4797.696	220479.9070	4583352.1390
5024	Drain_Field	4797.972	220462.3730	4583321.8430
5025	Drain_Field	4797.960	220386.0250	4583358.6730
5026	Drain_Field	4797.973	220404.1250	4583389.6780
5027	Drain_Pipe	4798.363	220406.2090	4583384.9140
5029	Drain_Pipe	4798.400	220473.2310	4583350.6440
5030	Drain_Pipe	4798.456	220468.5710	4583342.1270
5032	Drain_Pipe	4798.375	220401.6990	4583375.3180
5033	Valve_Box	4798.234	220441.3820	4583370.4900
5034	Inspection_Port	4798.080	220442.8490	4583368.9400

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60 0 30 60
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LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM
UNDERGROUND POWER
WATERLINE
STORMWATER DRAINAGE CHANNEL

ASPHALT
CONCRETE
GRAVEL SHOULDER

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT S
FINAL LIFT
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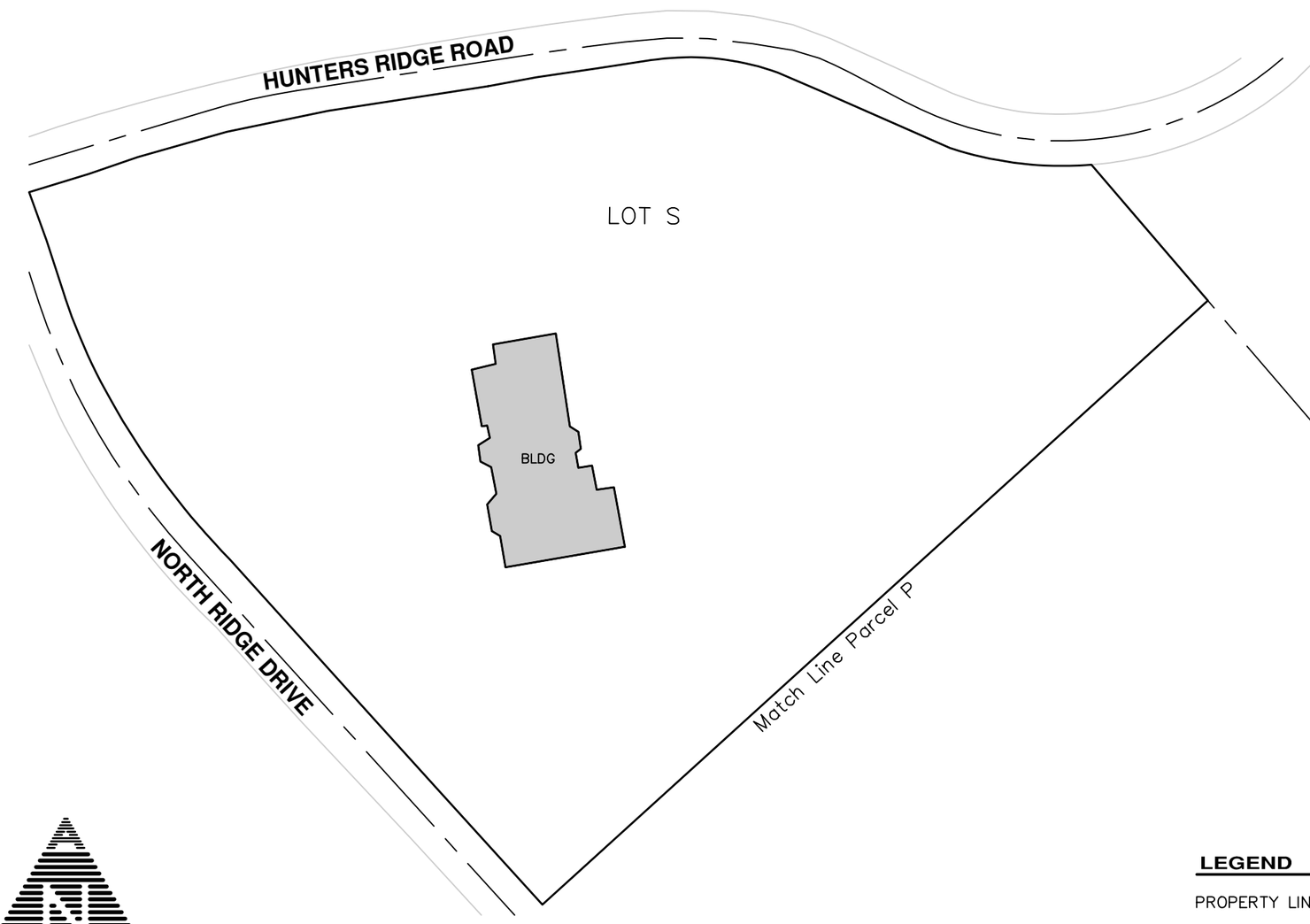
SURVEYED BY:	DNN
SCALE:	AS SHOWN

S.3

EXCAVATION DESCRIPTION FOR LOT S

LOT 8, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON



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LEGEND

PROPERTY LINE

CENTER LINE

EXCAVATION BOUNDARY

EDGE OF PAVEMENT

60 0 30 60

(FEET)

No.	REVISION	DATE	BY

NORTHRIDGE REMEDIATION
LOT S
LEGAL DESCRIPTION
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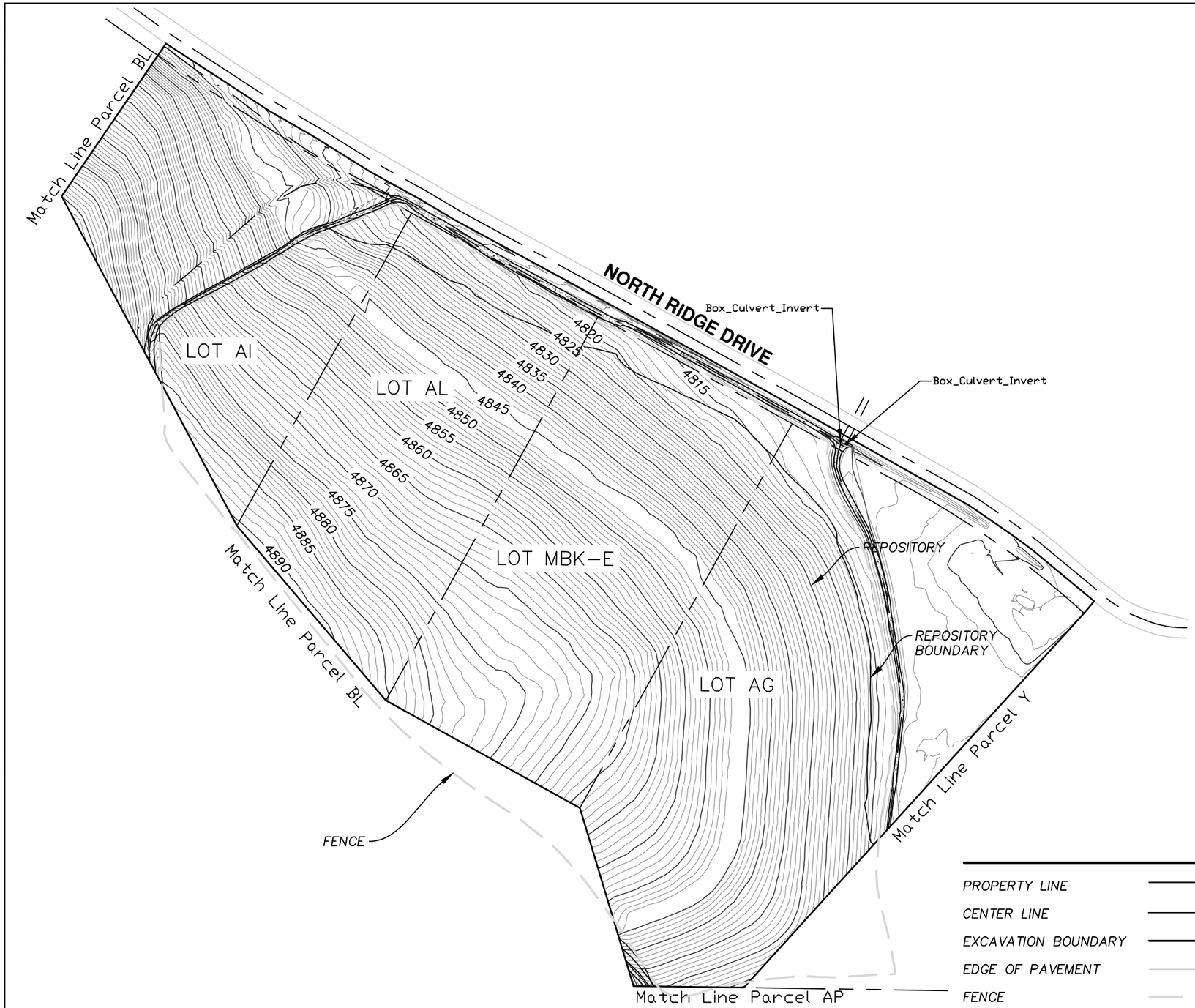
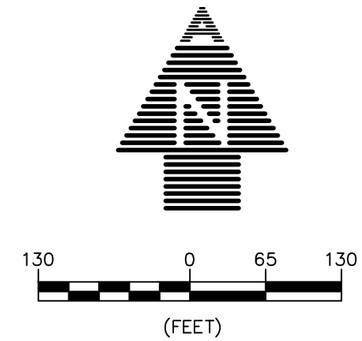
SURVEYED BY:	DNN
SCALE:	AS SHOWN

S.4





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90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	
FENCE	
STORMWATER DRAINAGE CHANNEL	
OVERSIZED MATERIAL	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT SPR
FINAL LIFT
TOPOGRAPHIC SURVEY

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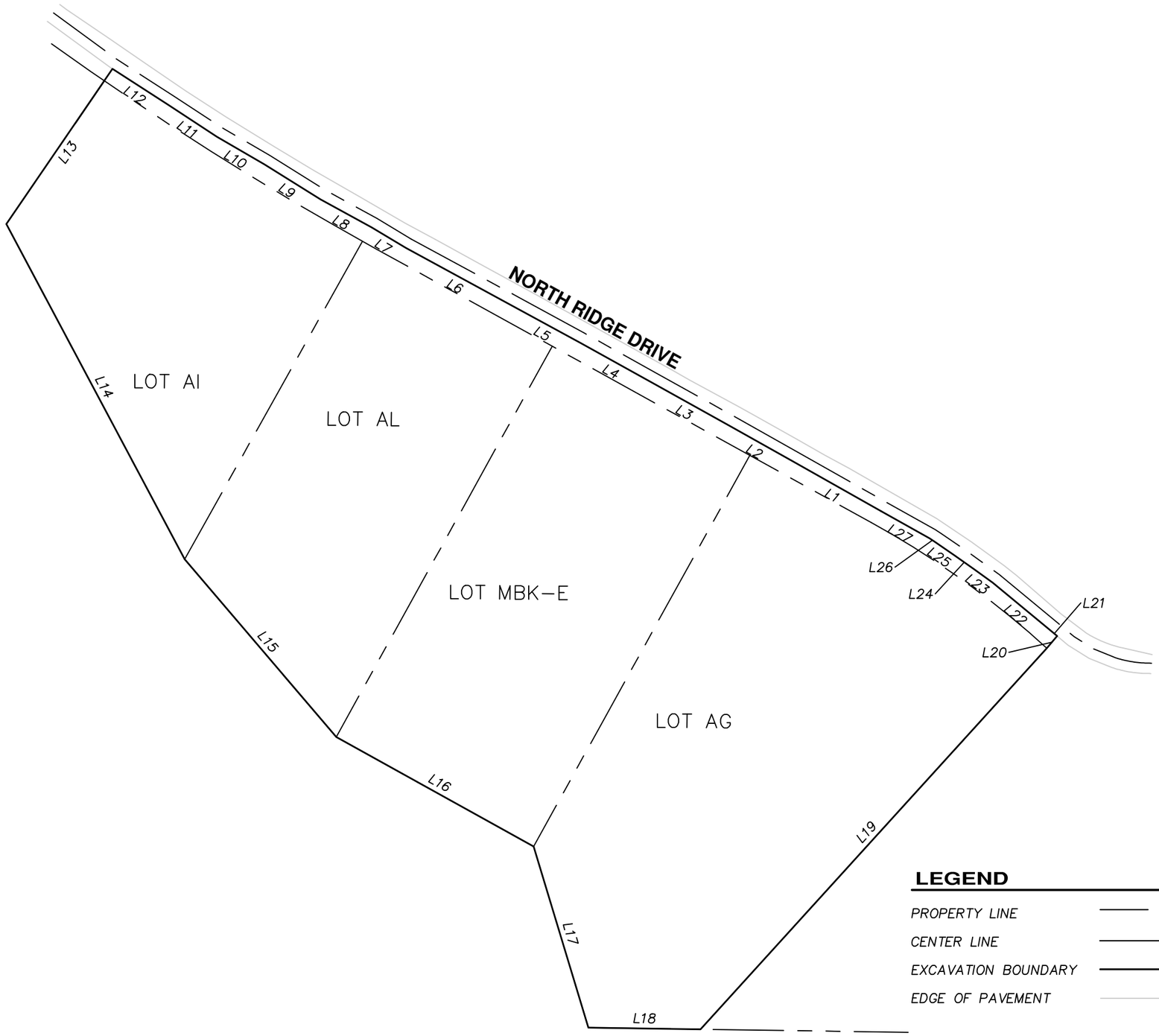
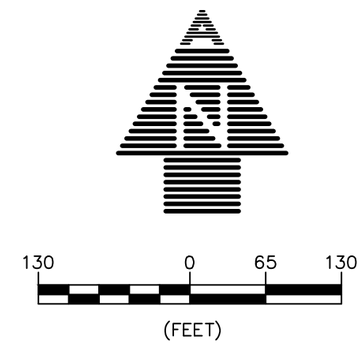
SCALE:	AS SHOWN

SPR.3





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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT SPR

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SCALE:	AS SHOWN

SPR.4

EXCAVATION DESCRIPTION FOR LOT AI, AL, AG, & MBK-E DESCRIPTION
LOT 4 OF BLOCK 1, OF NORTH RIDGE ESTATES, LOTS 21, 22, & 23, OF THE SECOND ADDITION TO NORTH RIDGE ESTATES, SITUATE IN THE SE1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S15°27'51"E A DISTANCE OF 4367.77 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 10 AND 15 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- N60°30'00"W 117.25 FEET
- N60°41'35"W 87.10 FEET
- N60°54'35"W 98.35 FEET
- N60°56'57"W 94.83 FEET
- N61°22'47"W 86.51 FEET
- N61°29'26"W 141.85 FEET
- N59°06'44"W 45.93 FEET
- N61°09'08"W 67.28 FEET
- N58°02'35"W 76.14 FEET
- N59°53'43"W 63.29 FEET
- N56°46'04"W 67.09 FEET
- N57°07'29"W 76.50 FEET
- S34°19'54"W 216.67 FEET
- S28°01'0"E 437.32 FEET
- S40°26'46"E 269.11 FEET
- S61°01'32"E 260.00 FEET
- S16°46'35"E 217.92 FEET
- S89°08'49"E 129.25 FEET
- N42°16'16"E 593.09 FEET
- N40°00'09"E 18.40 FEET
- N49°59'51"W 8.53 FEET
- N50°23'39"W 87.58 FEET
- N54°04'56"W 27.09 FEET
- N54°52'59"W 27.10 FEET
- N55°41'01"W 27.10 FEET
- N56°11'58"W 7.82 FEET
- N60°45'43"W 63.78 FEET

TO THE POINT OF BEGINNING WHICH ALSO BEARS N42°56'01"E DISTANCE OF 1757.53 FEET FROM THE 1/4 SECTION CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 13.57 ACRES, MORE OR LESS.

Line Table		
Line #	Length	Direction
L1	117.25	N60° 30' 00"W
L2	87.10	N60° 41' 35"W
L3	98.35	N60° 54' 35"W
L4	94.83	N60° 56' 57"W
L5	86.51	N61° 22' 47"W
L6	141.85	N61° 29' 26"W
L7	45.93	N59° 06' 44"W
L8	67.28	N61° 09' 08"W
L9	76.14	N58° 02' 35"W
L10	63.29	N59° 53' 43"W
L11	67.09	N56° 46' 04"W
L12	76.50	N57° 07' 29"W
L13	216.67	S34° 19' 54"W
L14	437.32	S28° 01' 06"E
L15	269.11	S40° 26' 46"E
L16	260.00	S61° 01' 32"E
L17	217.92	S16° 46' 35"E
L18	129.25	S89° 08' 49"E
L19	593.09	N42° 16' 16"E
L20	18.40	N40° 00' 09"E

Line Table		
Line #	Length	Direction
L21	8.53	N49° 59' 51"W
L22	87.58	N50° 23' 39"W
L23	27.09	N54° 04' 56"W
L24	27.10	N54° 52' 59"W
L25	27.10	N55° 41' 01"W
L26	7.82	N56° 11' 58"W
L27	63.78	N60° 45' 43"W

130 0 65 130
(FEET)

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LOT SPR
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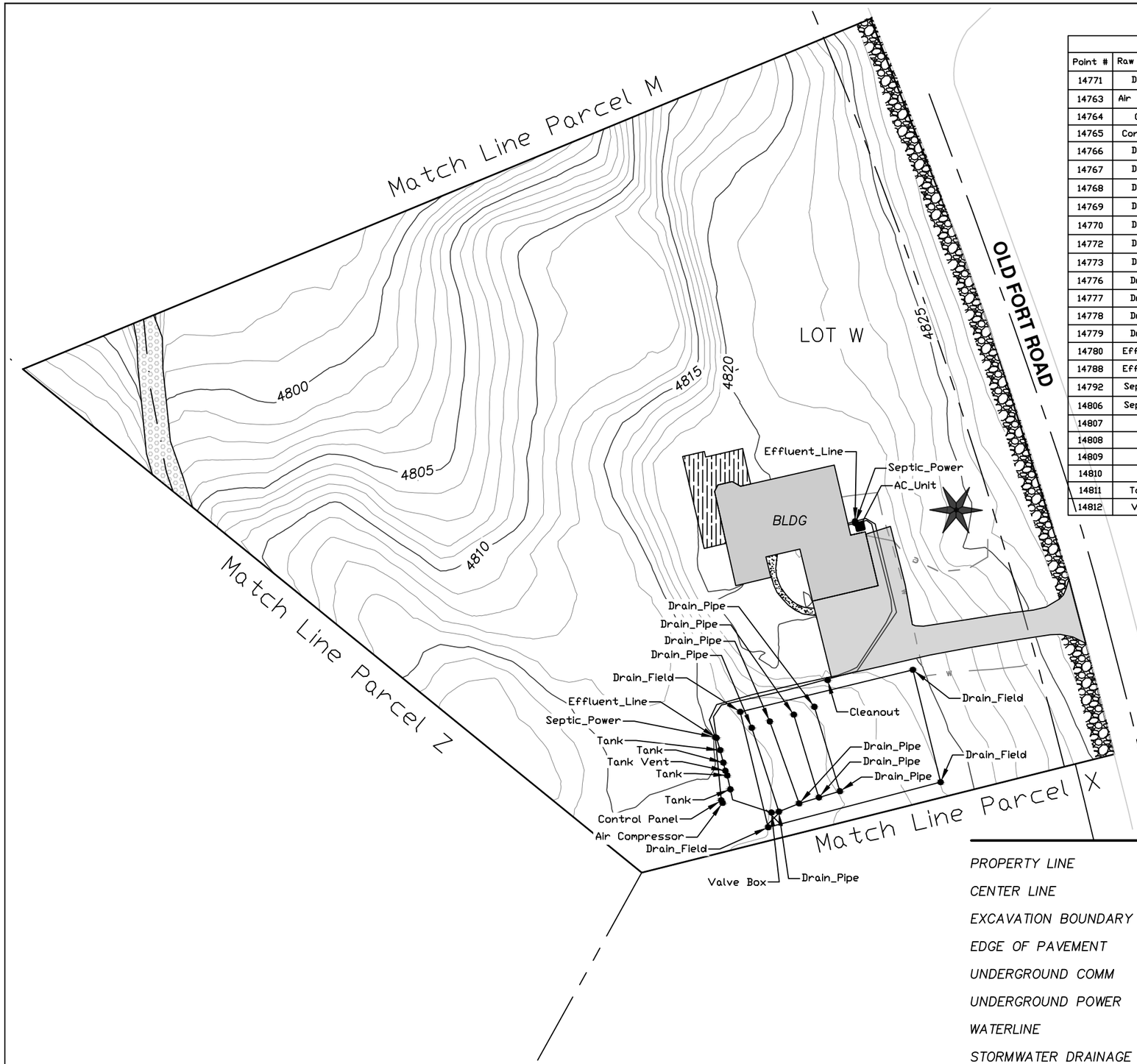
SPR.5



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
14771	Drain_Pipe	4816.76	219447.3070	4584950.7860
14763	Air Compressor	4815.98	219407.7520	4584918.9260
14764	Cleanout	4817.81	219462.8360	4584965.9630
14765	Control Panel	4814.86	219408.8750	4584918.2640
14766	Drain_Pipe	4815.52	219403.8220	4584944.0930
14767	Drain_Pipe	4816.13	219441.3990	4584931.9810
14768	Drain_Pipe	4816.36	219444.2620	4584940.0140
14769	Drain_Pipe	4815.70	219407.4560	4584953.1850
14770	Drain_Pipe	4816.15	219410.1880	4584962.0530
14772	Drain_Pipe	4817.00	219450.8330	4584960.0160
14773	Drain_Pipe	4816.44	219413.0050	4584971.4880
14776	Drain_Field	4815.69	219396.7900	4584939.3350
14777	Drain_Field	4818.32	219417.0270	4585016.6240
14778	Drain_Field	4818.88	219467.3750	4585004.2040
14779	Drain_Field	4815.19	219448.5770	4584926.8160
14780	Effluent_Line	4820.39	219533.9300	4584978.2690
14788	Effluent_Line	4813.44	219436.9070	4584916.1660
14792	Septic_Power	4813.18	219437.1750	4584915.6060
14806	Septic_Power	4819.68	219533.1670	4584978.3600
14807	Tank	4815.24	219431.3750	4584917.8060
14808	Tank	4815.30	219425.7830	4584919.2380
14809	Tank	4815.37	219420.0890	4584920.9410
14810	Tank	4815.38	219413.8310	4584922.3510
14811	Tank Vent	4816.08	219422.1160	4584920.1250
14812	Valve Box	4815.90	219403.4110	4584940.8090

50 0 25 50

(FEET)

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LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM
UNDERGROUND POWER
WATERLINE
STORMWATER DRAINAGE CHANNEL

TREE
DECK
ASPHALT
CONCRETE
GRAVEL SHOULDER
OVERSIZED MATERIAL

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LOT W
FINAL LIFT
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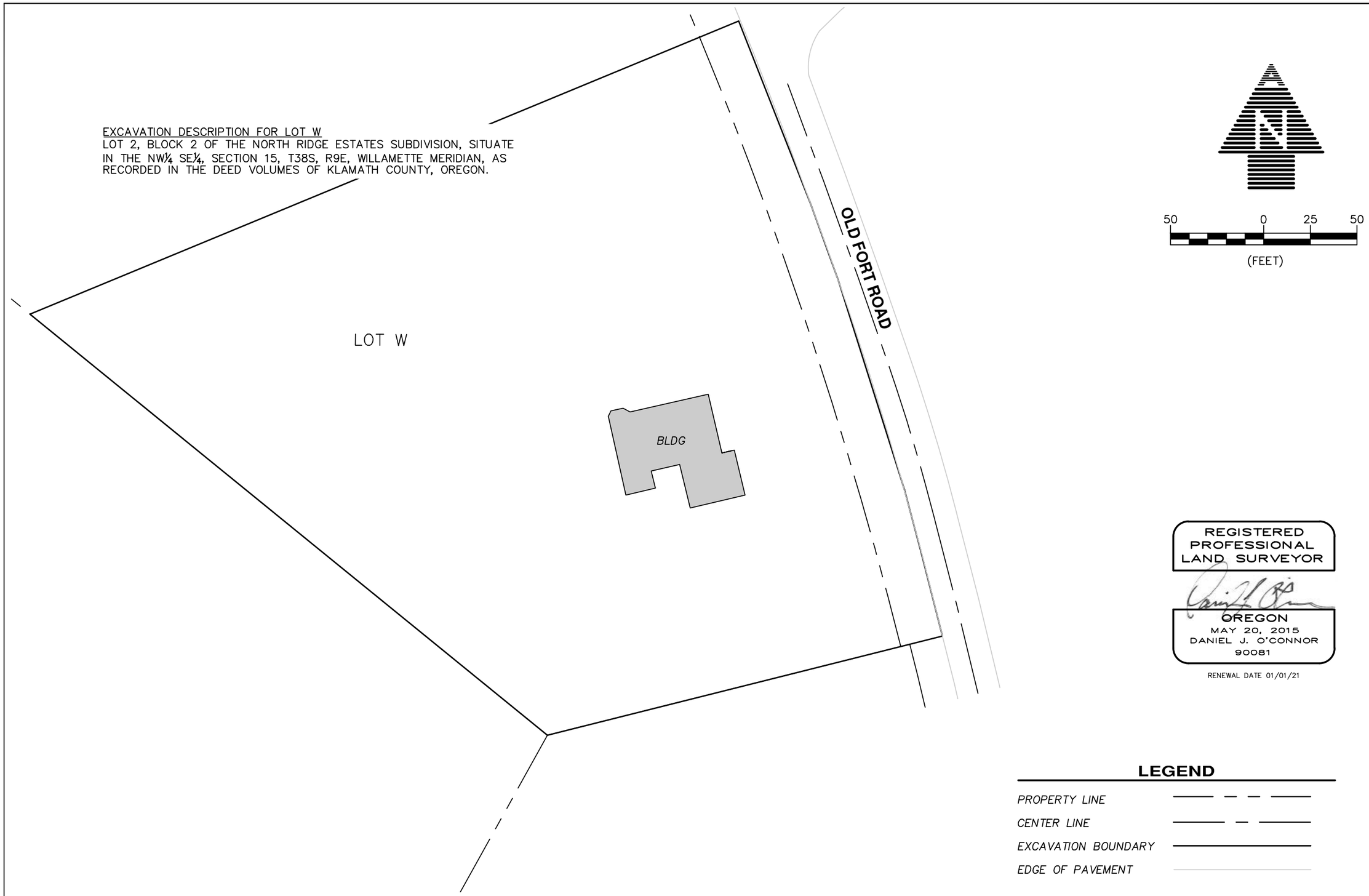
W.3

EXCAVATION DESCRIPTION FOR LOT W

LOT 2, BLOCK 2 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT W

LEGAL DESCRIPTION

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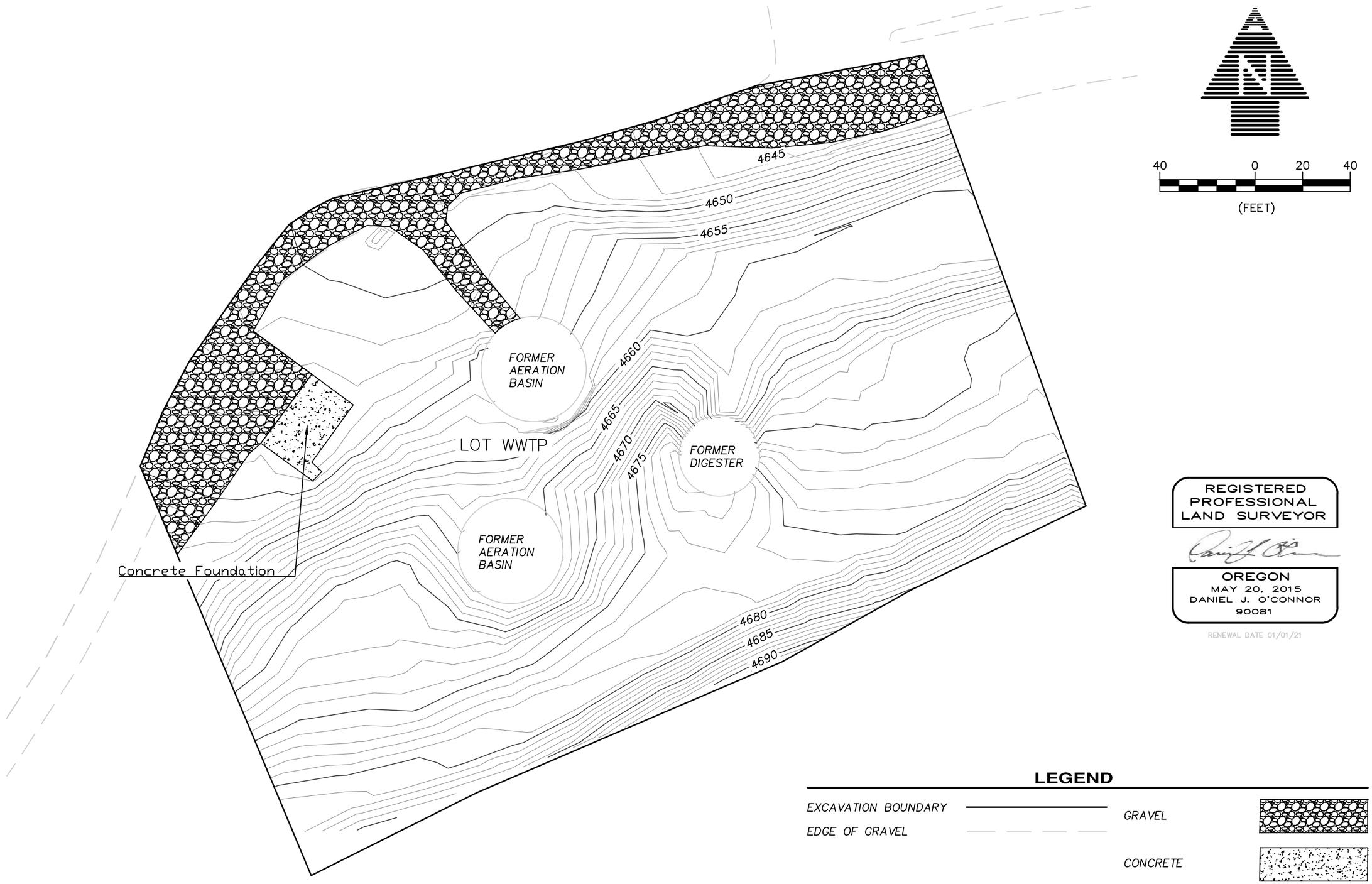
SCALE:	AS SHOWN

W.4



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NORTH RIDGE ESTATES SUPERFUND SITE

LOT WWTP
FINAL LIFT

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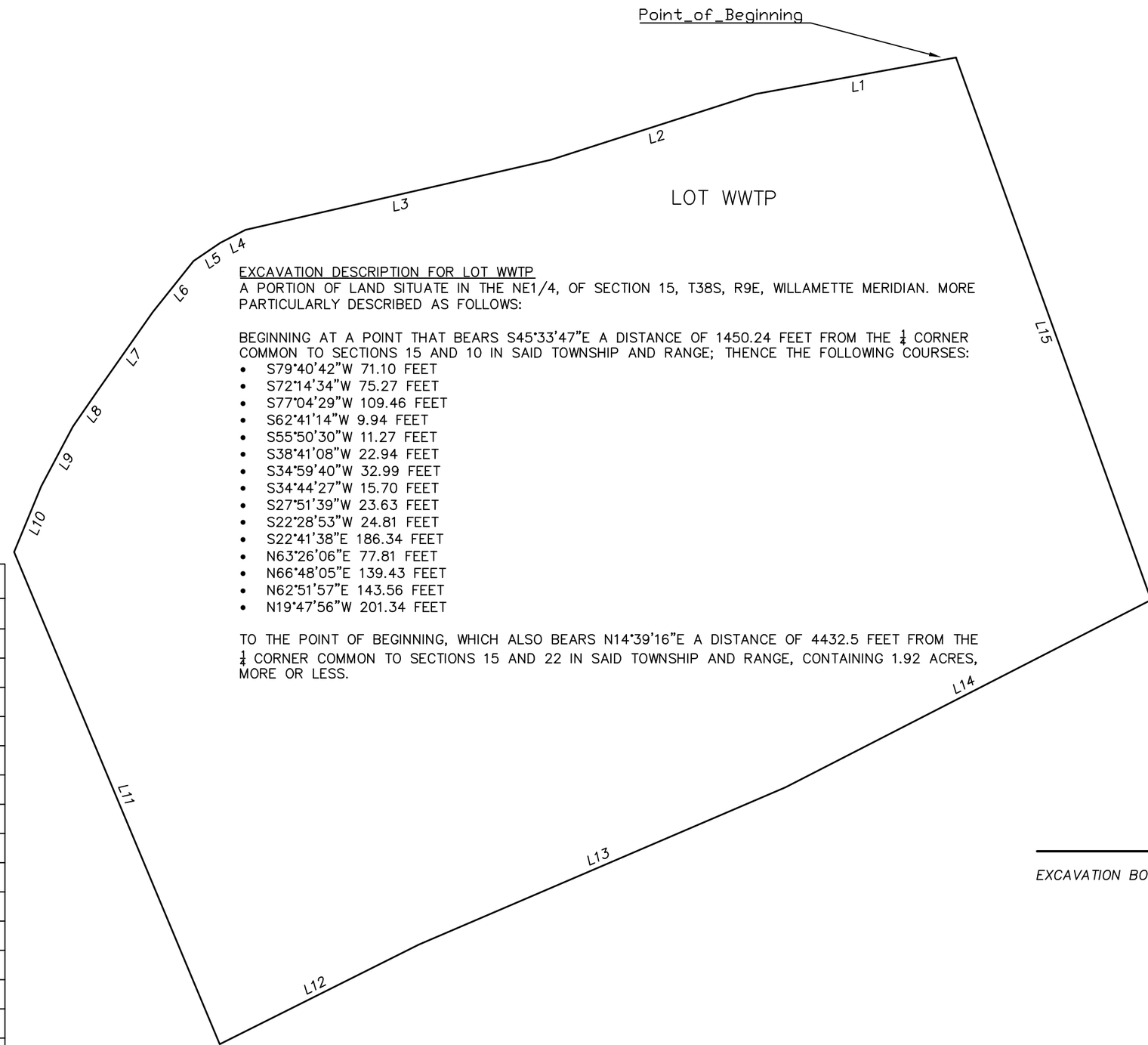
WWTP.3



EXCAVATION DESCRIPTION FOR LOT WWTP

A PORTION OF LAND SITUATE IN THE NE1/4, OF SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT BEARS S45°33'47"E A DISTANCE OF 1450.24 FEET FROM THE $\frac{1}{4}$ CORNER COMMON TO SECTIONS 15 AND 10 IN SAID TOWNSHIP AND RANGE; THENCE THE FOLLOWING COURSES:

- S79°40'42"W 71.10 FEET
- S72°14'34"W 75.27 FEET
- S77°04'29"W 109.46 FEET
- S62°41'14"W 9.94 FEET
- S55°50'30"W 11.27 FEET
- S38°41'08"W 22.94 FEET
- S34°59'40"W 32.99 FEET
- S34°44'27"W 15.70 FEET
- S27°51'39"W 23.63 FEET
- S22°28'53"W 24.81 FEET
- S22°41'38"E 186.34 FEET
- N63°26'06"E 77.81 FEET
- N66°48'05"E 139.43 FEET
- N62°51'57"E 143.56 FEET
- N19°47'56"W 201.34 FEET

TO THE POINT OF BEGINNING, WHICH ALSO BEARS N14°39'16"E A DISTANCE OF 4432.5 FEET FROM THE $\frac{1}{4}$ CORNER COMMON TO SECTIONS 15 AND 22 IN SAID TOWNSHIP AND RANGE, CONTAINING 1.92 ACRES, MORE OR LESS.

LINE DATA		
LINE #	BEARING	LENGTH
L1	S79°40'42"W	71.10
L2	S72°14'34"W	75.27
L3	S77°04'29"W	109.46
L4	S62°41'14"W	9.94
L5	S55°50'30"W	11.27
L6	S38°41'08"W	22.94
L7	S34°59'40"W	32.99
L8	S34°44'27"W	15.70
L9	S27°51'39"W	23.63
L10	S22°28'53"W	24.81
L11	S22°41'38"E	186.34
L12	N63°26'06"E	77.81
L13	N66°48'05"E	139.43
L14	N62°51'57"E	143.56
L15	N19°47'56"W	201.34

40 0 20 40

(FEET)

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MAY 20, 2015
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LEGEND

EXCAVATION BOUNDARY

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT WWTP

LEGAL DESCRIPTION

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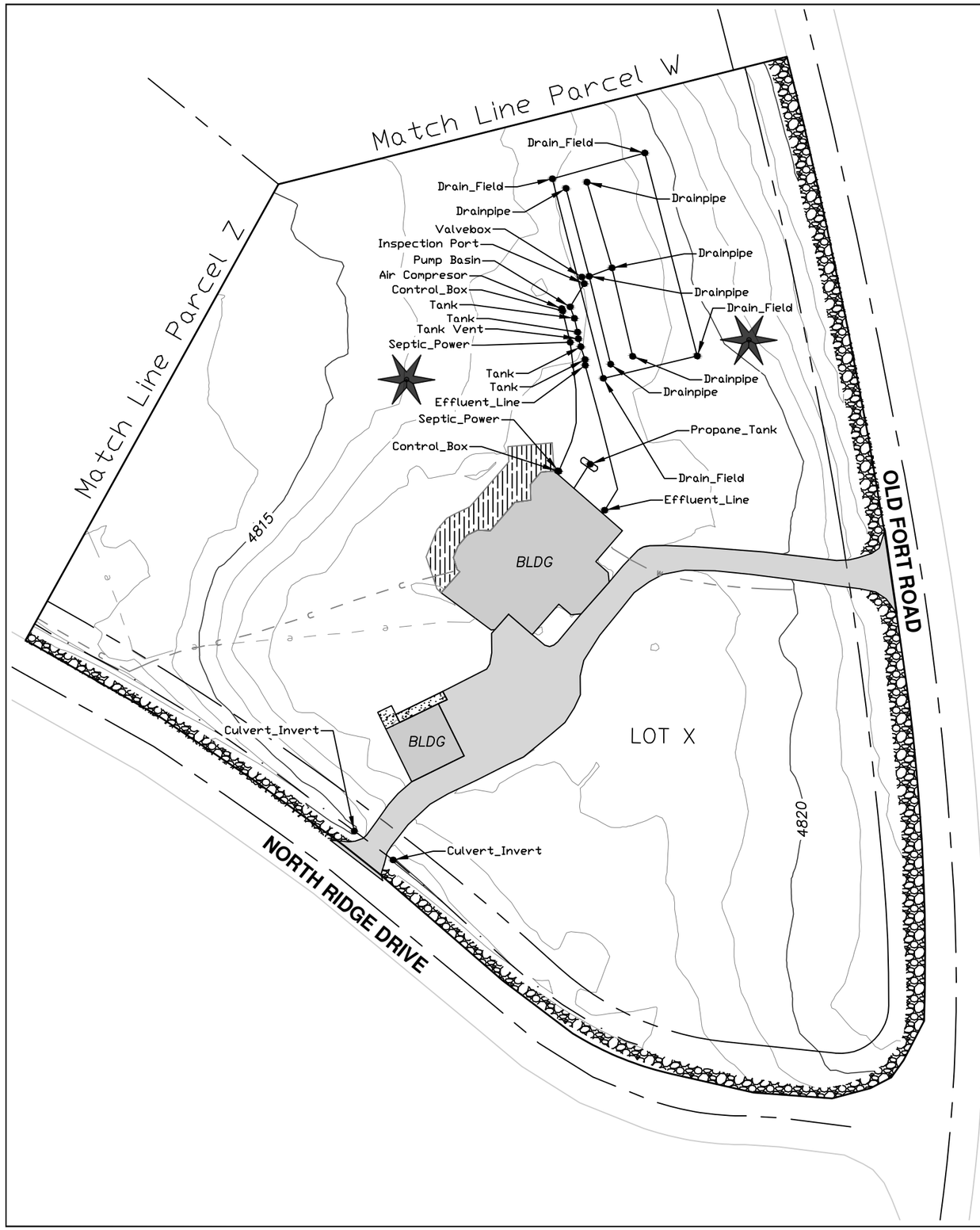
SCALE:	AS SHOWN

WWTP.4



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
15082	Air Compresor	4818.71	219324.6790	4585000.6420
15090	Drainpipe	4818.48	219304.8470	4585030.1920
15083	Control_Box	4817.04	219323.7230	4585000.9810
15084	Control_Box	4818.65	219257.1040	4584998.9360
15085	Drainpipe	4818.31	219301.5180	4585020.9990
15086	Drainpipe	4817.58	219338.1410	4585012.0950
15087	Drainpipe	4818.14	219374.7200	4585002.4450
15088	Drainpipe	4818.56	219377.3070	4585011.1410
15089	Drainpipe	4817.88	219341.6540	4585021.5830
15091	Drain_Field	4818.57	219295.6410	4585017.9750
15092	Drain_Field	4818.87	219304.9460	4585057.1120
15093	Drain_Field	4818.61	219389.4530	4585035.2450
15094	Drain_Field	4817.50	219378.6990	4584996.7590
15095	Effluent_Line	4816.99	219301.0890	4585010.3910
15098	Effluent_Line	4817.80	219240.7130	4585018.5200
15099	Inspection Port	4817.95	219335.0390	4585010.0150
15100	Pump Basin	4817.73	219325.3710	4585004.1800
15101	Septic_Power	4816.94	219257.0140	4584999.3980
15105	Septic_Power	4816.38	219310.6780	4585004.2020
15106	Tank	4817.81	219320.6670	4585005.9150
15107	Tank	4817.79	219314.9040	4585007.2320
15108	Tank	4817.99	219308.8170	4585008.6260
15109	Tank	4817.97	219303.4640	4585010.3550
15110	Tank Vent	4818.85	219312.1550	4585007.6050
15111	Valvebox	4818.03	219337.8140	4585008.9900

50 0 25 50

(FEET)

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OREGON
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DANIEL J. O'CONNOR
90081

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LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM
UNDERGROUND POWER
WATERLINE
STORMWATER DRAINAGE CHANNEL

TREE
DECK
ASPHALT
CONCRETE
GRAVEL SHOULDER

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT X
FINAL LIFT
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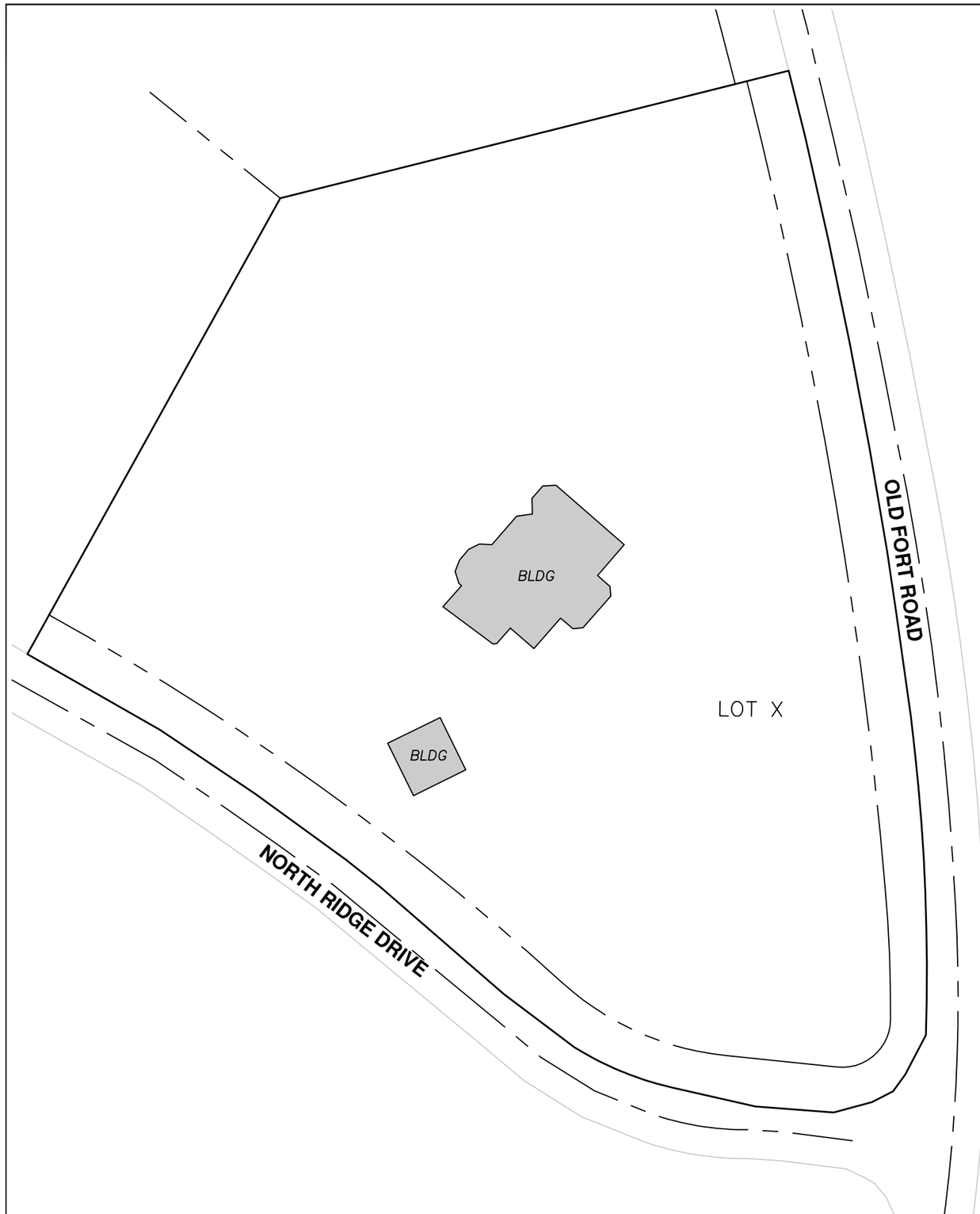
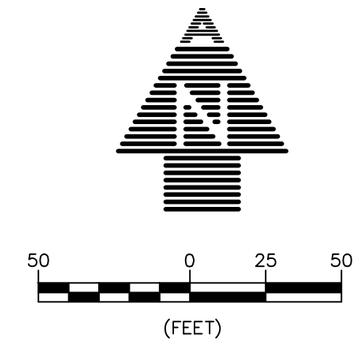
X.3





EXCAVATION DESCRIPTION FOR LOT X

LOT 1, BLOCK 2 OF THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.

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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

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NORTH RIDGE ESTATES SUPERFUND SITE

LOT X

LEGAL DESCRIPTION

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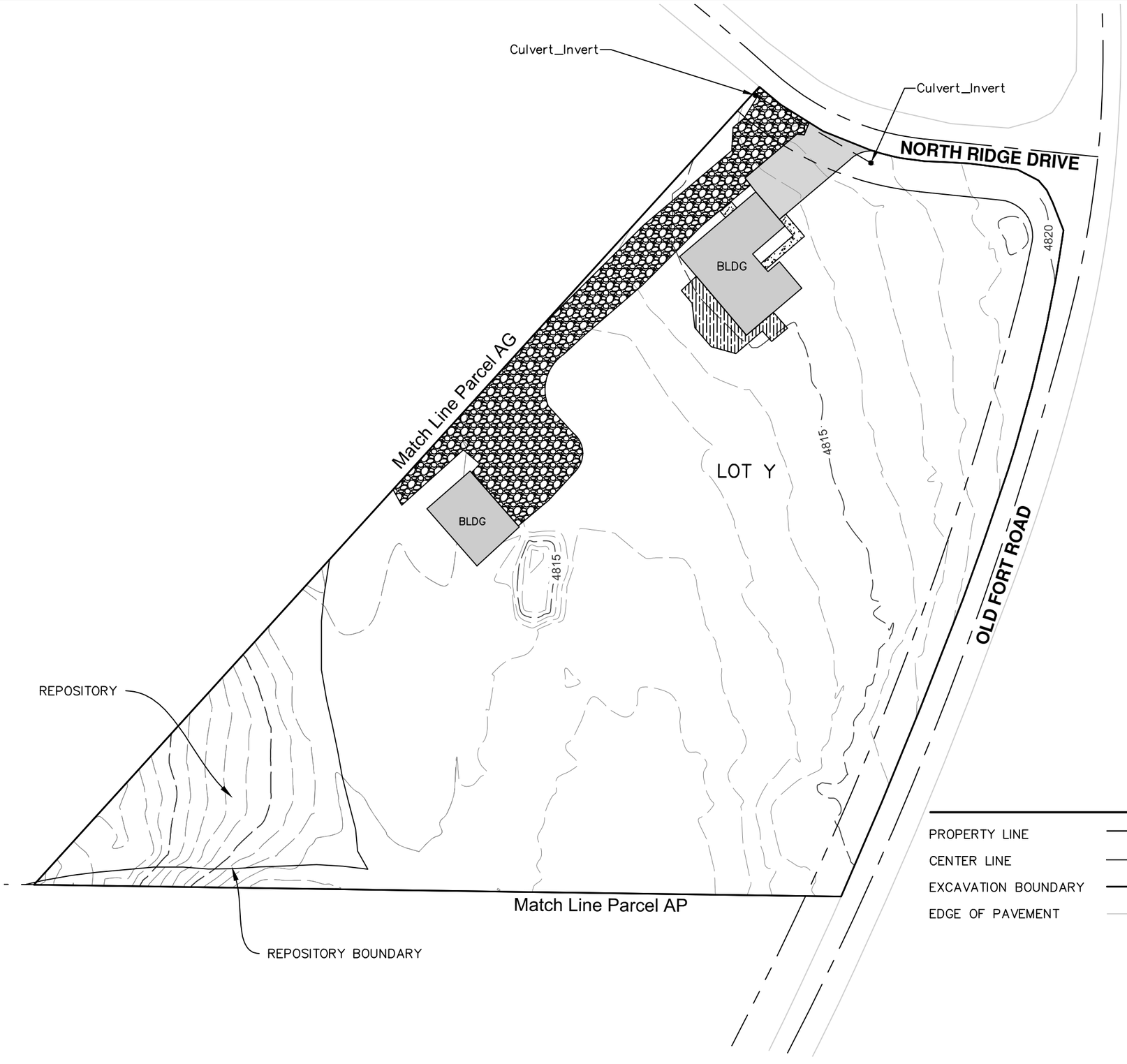
X.4



60 0 30 60

(FEET)

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OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	DECK
CENTER LINE	ASPHALT
EXCAVATION BOUNDARY	CONCRETE
EDGE OF PAVEMENT	GRAVEL

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT Y
PRE-EXCAVATION
TOPOGRAPHIC SURFACE

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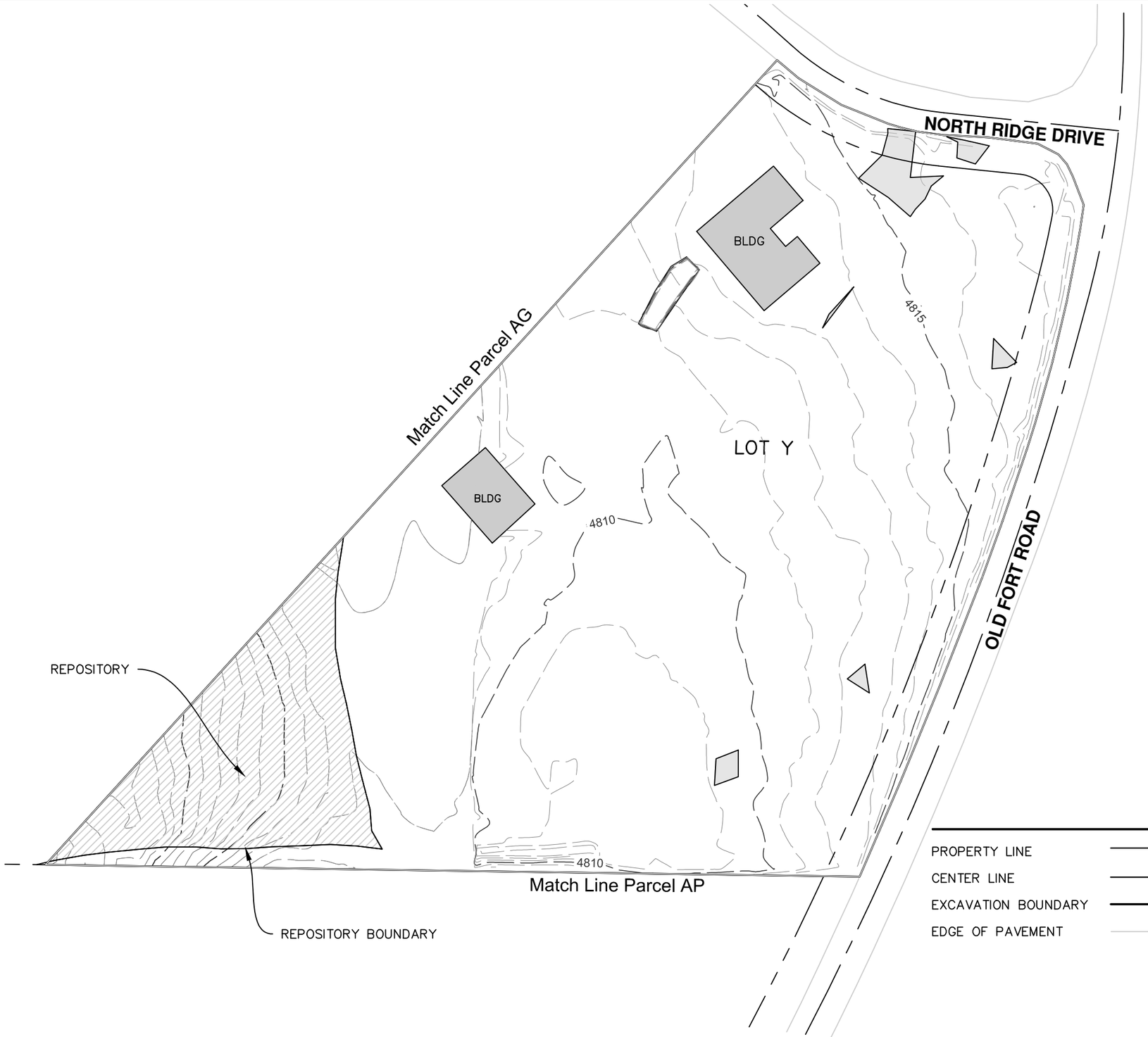
SURVEYED BY:	DNN
SCALE:	1" = 60'

Y.1



60 0 30 60

(FEET)

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OREGON
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90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	
EXCAVATION DEPTH NOT ACHIEVED DUE TO HARDPAN	
MARKER BARRIER	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT Y
POST-EXCAVATION
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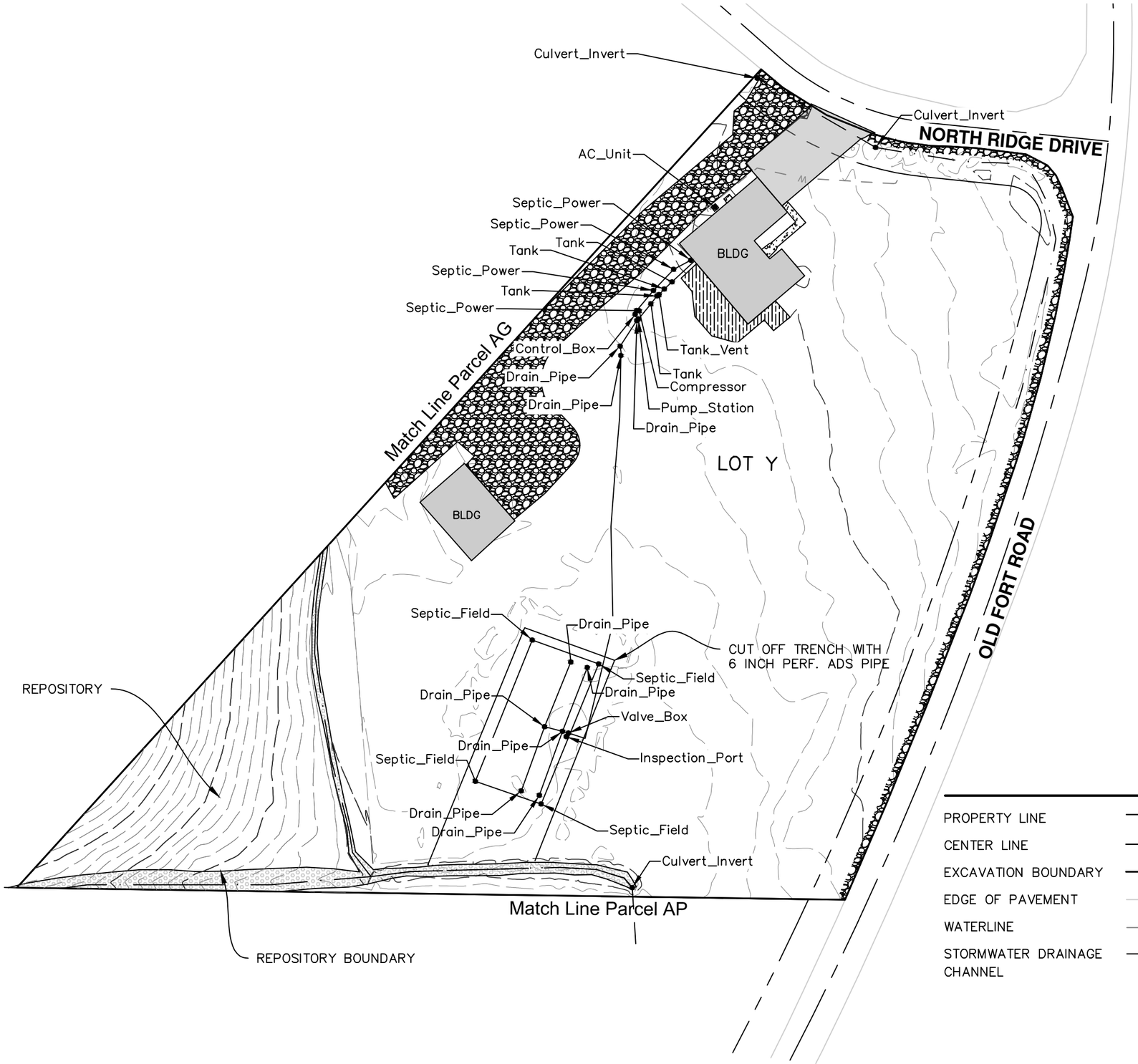
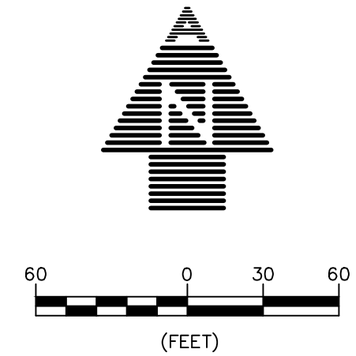
SURVEYED BY:	DNN
SCALE:	1" = 60'

Y.2





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LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	
WATERLINE	W
STORMWATER DRAINAGE CHANNEL	
ASPHALT	
CONCRETE	
GRAVEL	
DECK	
OVERSIZED MATERIAL	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE

LOT Y

FINAL SURFACE AS-BUILT

TOPOGRAPHIC SURFACE

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Oregon • California

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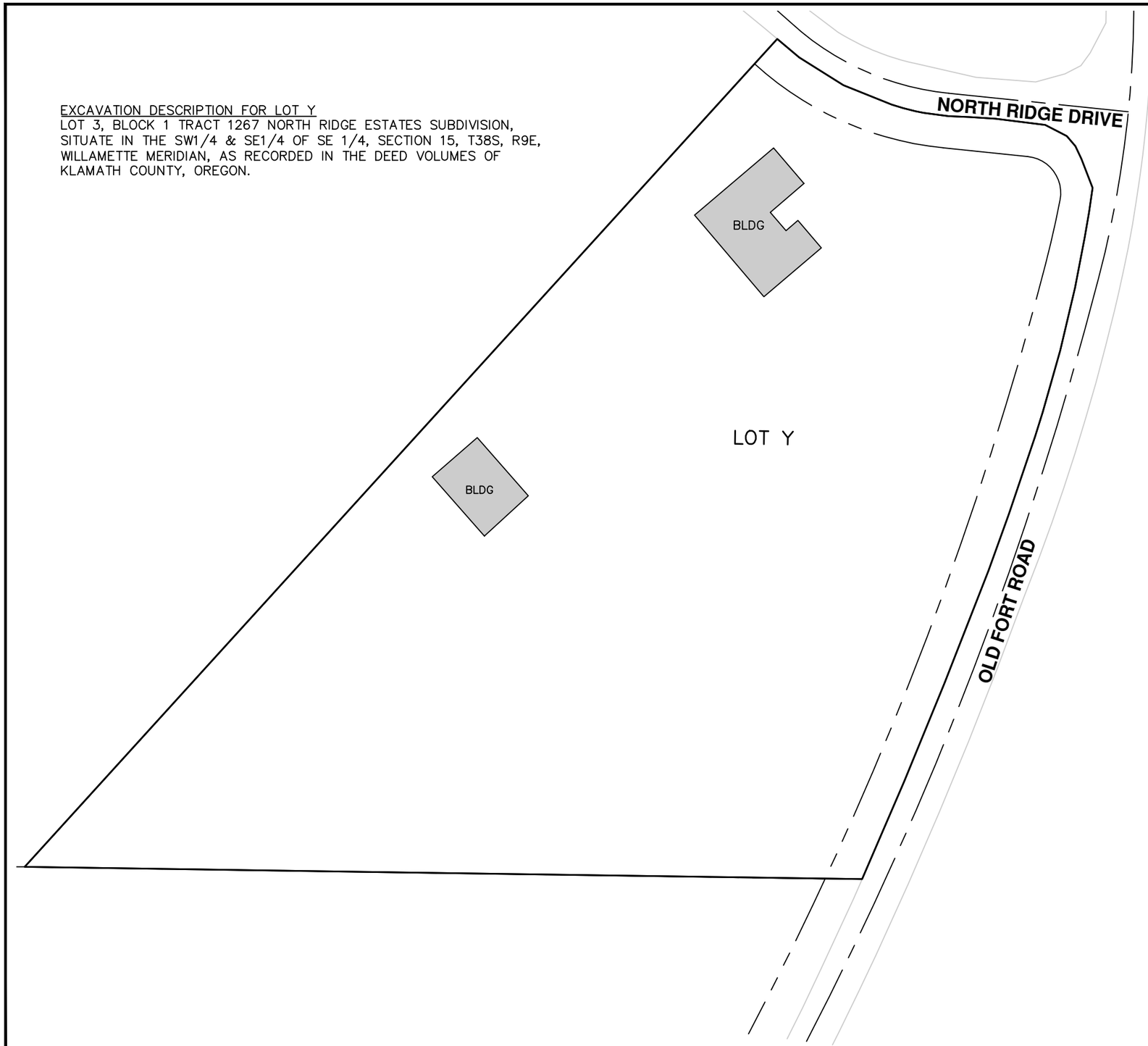
DATE:	2/21/2019
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	1" = 60'

Y.3

EXCAVATION DESCRIPTION FOR LOT Y
LOT 3, BLOCK 1 TRACT 1267 NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE SW1/4 & SE1/4 OF SE 1/4, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



60 0 30 60
(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT Y
LEGAL EXHIBIT
TOPOGRAPHIC SURFACE

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Oregon * California
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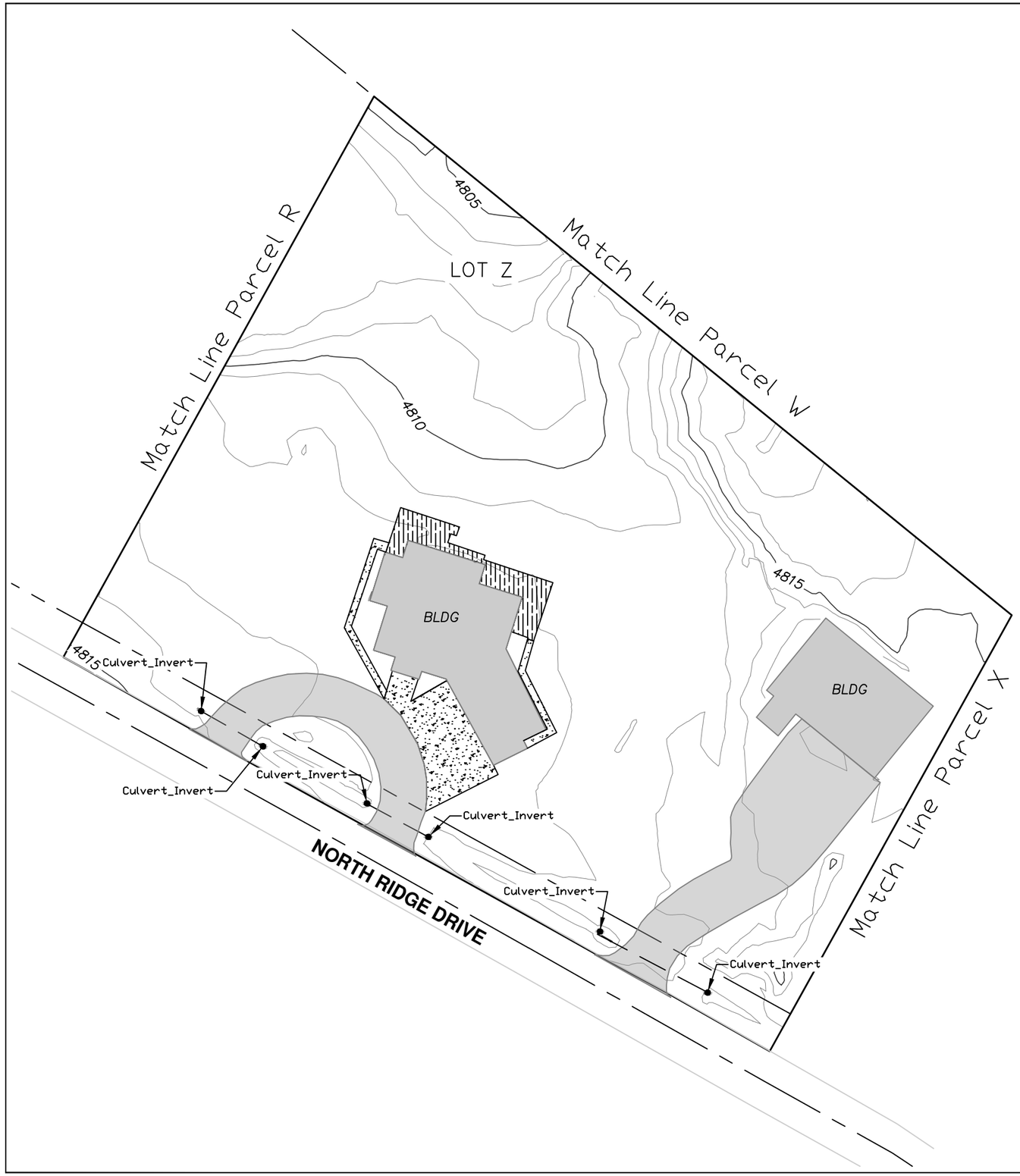
DATE:	2/21/2019
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	1" = 60'

Y.4



50 0 25 50

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	DECK
CENTER LINE	
EXCAVATION BOUNDARY	ASPHALT
EDGE OF PAVEMENT	CONCRETE

NORTH RIDGE ESTATES SUPERFUND SITE

LOT Z

PRE-EXCAVATION

TOPOGRAPHIC SURVEY

No.	REVISION	DATE	BY

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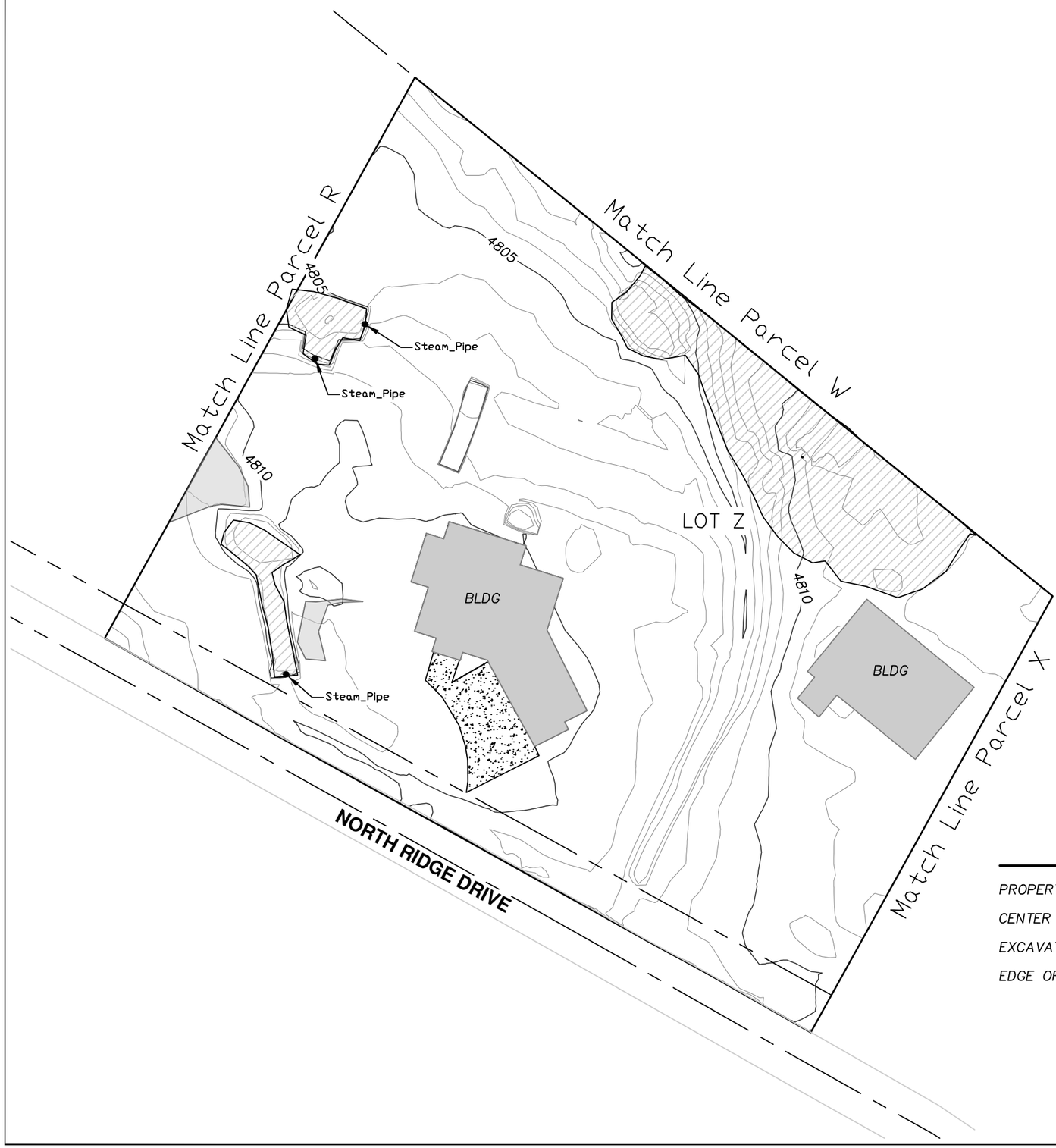
DATE:	2/21/2019
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

Z.1



50 0 25 50

(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE	
CENTER LINE	
EXCAVATION BOUNDARY	
EDGE OF PAVEMENT	
MARKER BARRIER	
EXCAVATION DEPTH NOT ACHIEVED DUE TO HARDPAN	
STEAM PIPE	•

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT Z
POST-EXCAVATION
TOPOGRAPHIC SURVEY

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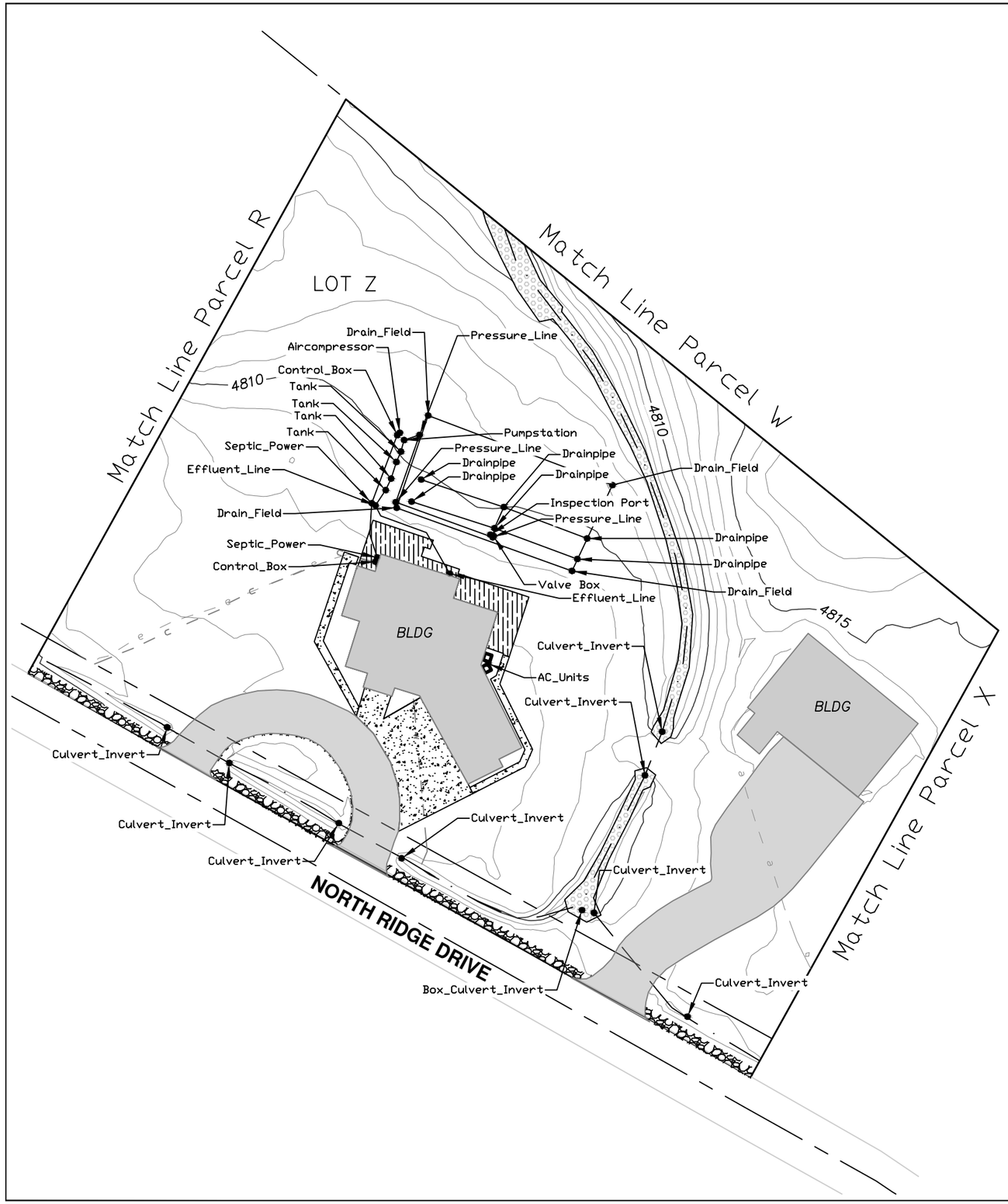
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

Z.2



Point Table				
Point #	Raw Description	Elevation	Northing	Easting
13053	Aircompressor	4810.53	219460.4270	4584628.0280
13054	Control_Box	4809.15	219459.4100	4584627.0060
13055	Control_Box	4813.94	219405.6220	4584617.7450
13063	Effluent_Line	4809.45	219429.5590	4584617.7340
13056	Drain_Field	4810.34	219401.7040	4584701.3310
13057	Drain_Field	4808.03	219438.2030	4584718.5120
13058	Drain_Field	4808.76	219467.8140	4584640.1530
13059	Drain_Field	4809.90	219428.5710	4584626.7660
13060	Effluent_Line	4810.28	219400.5300	4584649.3440
13066	Inspection Port	4810.45	219417.1220	4584666.6270
13067	Pressure_Line	4807.44	219459.5270	4584636.5160
13068	Pressure_Line	4808.76	219430.9720	4584626.3660
13069	Pressure_Line	4808.93	219416.0070	4584667.5280
13070	Pumpstation	4809.73	219457.3200	4584629.9240
13071	Drainpipe	4810.58	219431.1650	4584633.0680
13072	Drainpipe	4809.87	219419.8870	4584668.3440
13073	Drainpipe	4810.51	219406.7760	4584703.5570
13074	Drainpipe	4810.18	219415.5130	4584707.7050
13075	Drainpipe	4809.35	219428.8560	4584672.3180
13076	Drainpipe	4810.24	219440.5700	4584637.1110
13077	Septic_Power	4810.60	219407.4740	4584618.5140
13079	Septic_Power	4808.96	219430.4970	4584616.1550
13080	Tank	4810.47	219436.0780	4584622.1040
13081	Tank	4810.44	219440.9830	4584624.3980
13082	Tank	4810.06	219448.0350	4584626.6250
13083	Tank	4810.11	219452.4730	4584628.5370
13084	Valve Box	4810.41	219416.5730	4584667.9660

50 0 25 50

(FEET)

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT
UNDERGROUND COMM
UNDERGROUND POWER
WATERLINE
STORMWATER DRAINAGE CHANNEL

DECK
ASPHALT
CONCRETE
OVERSIZE MATERIAL
GRAVEL SHOULDER

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT Z
FINAL LIFT
TOPOGRAPHIC SURVEY

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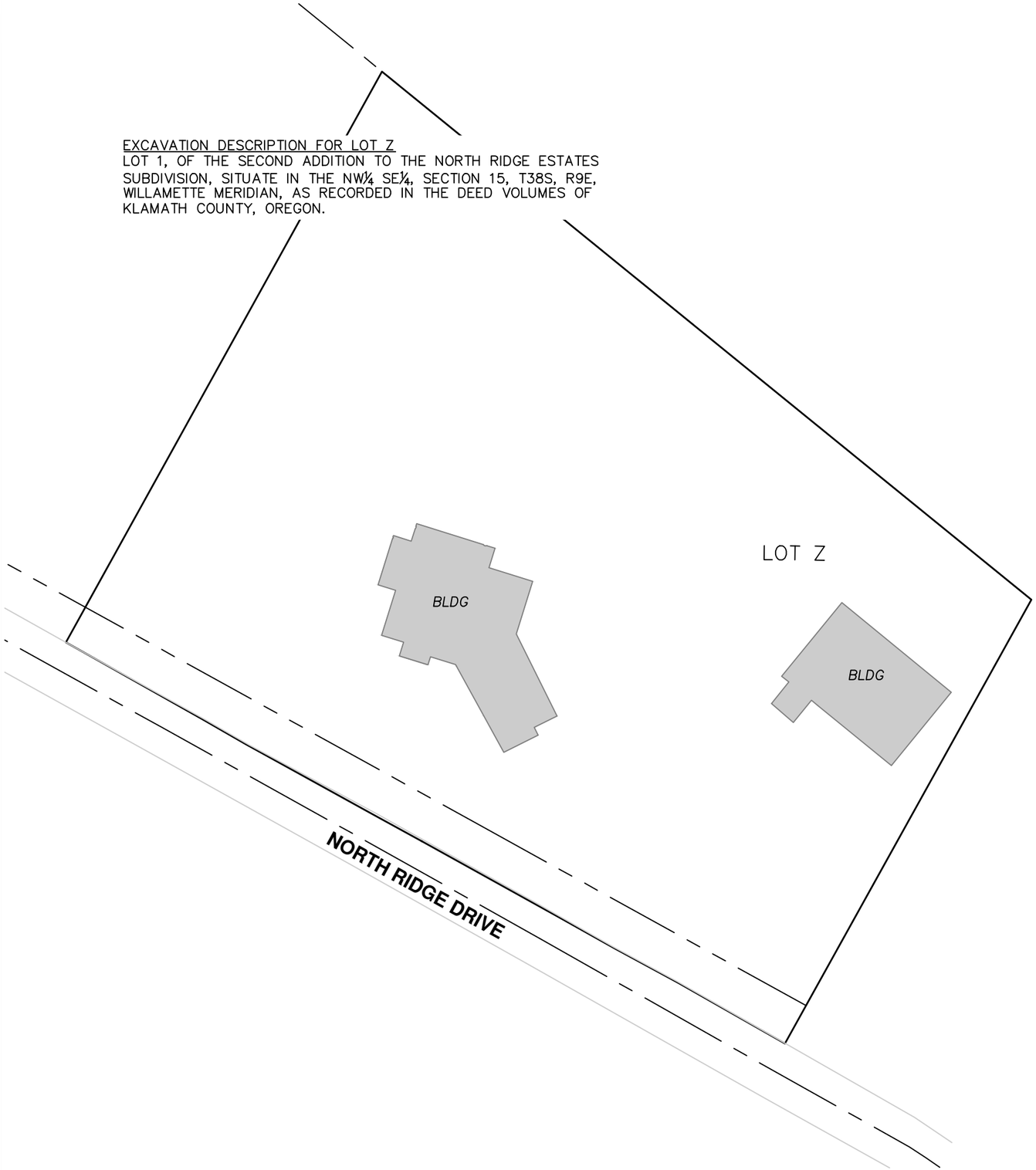
DATE:	2/21/2019
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

Z.3

EXCAVATION DESCRIPTION FOR LOT Z
LOT 1, OF THE SECOND ADDITION TO THE NORTH RIDGE ESTATES SUBDIVISION, SITUATE IN THE NW¼ SE¼, SECTION 15, T38S, R9E, WILLAMETTE MERIDIAN, AS RECORDED IN THE DEED VOLUMES OF KLAMATH COUNTY, OREGON.



50 0 25 50
(FEET)

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
MAY 20, 2015
DANIEL J. O'CONNOR
90081

RENEWAL DATE 01/01/21

LEGEND

PROPERTY LINE
CENTER LINE
EXCAVATION BOUNDARY
EDGE OF PAVEMENT

No.	REVISION	DATE	BY

NORTH RIDGE ESTATES SUPERFUND SITE
LOT Z
LEGAL DESCRIPTION
TOPOGRAPHIC SURVEY

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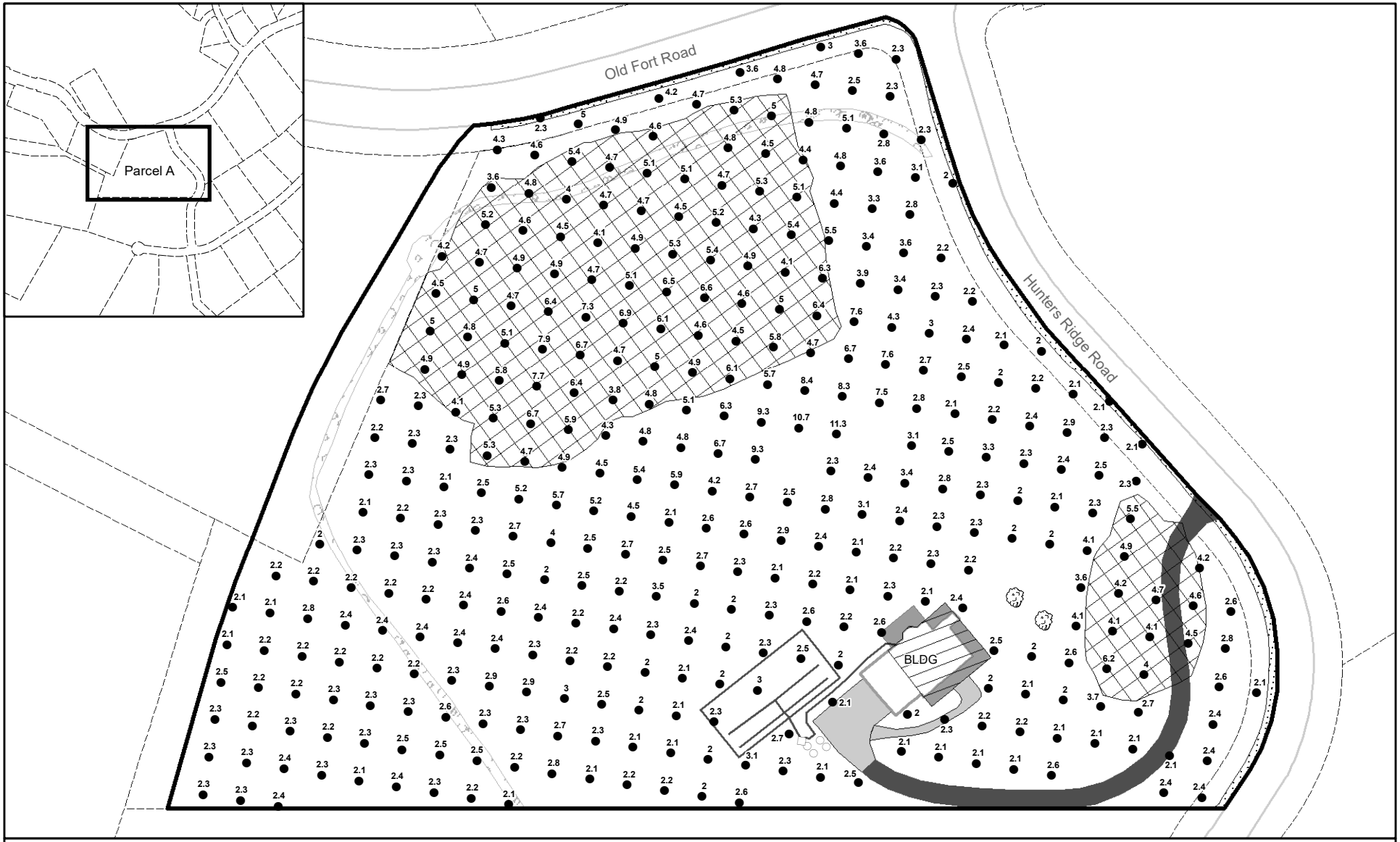
DATE:	2/21/2019
PROJECT:	3405-01
FILE:	PLAN
DESIGNED BY:	DJO
DRAWN BY:	ZEF
CHECKED BY:	DJO
SURVEYED BY:	DNN
SCALE:	AS SHOWN

Z.4

Appendix C

Appendix C

Cap Thickness Figures



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

Existing concrete driveway apron and garage floor slab were left in place. ACM may be present beneath this protective cap.

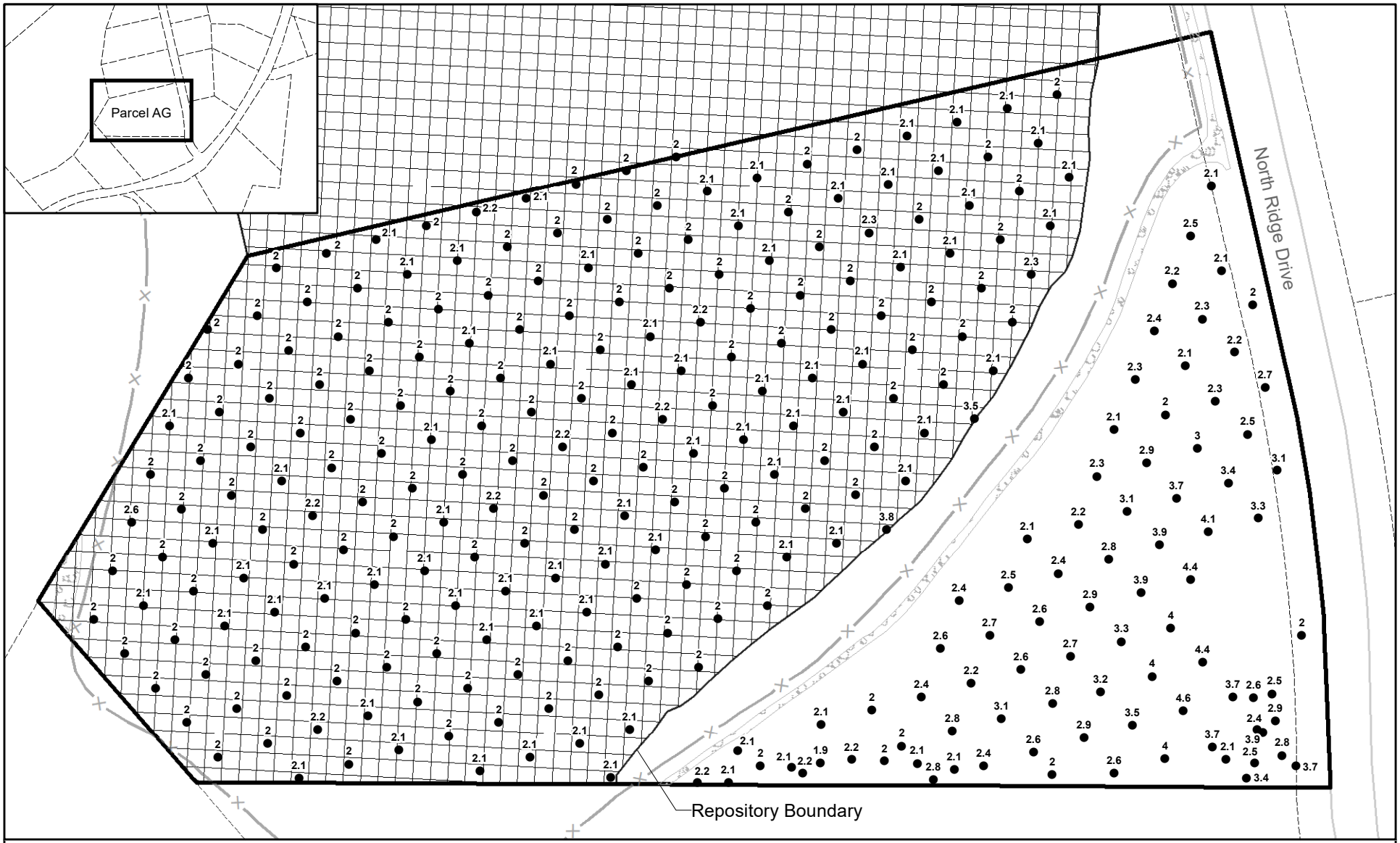
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 50 100
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3637 Hunters Ridge Road
Parcel A

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_A_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

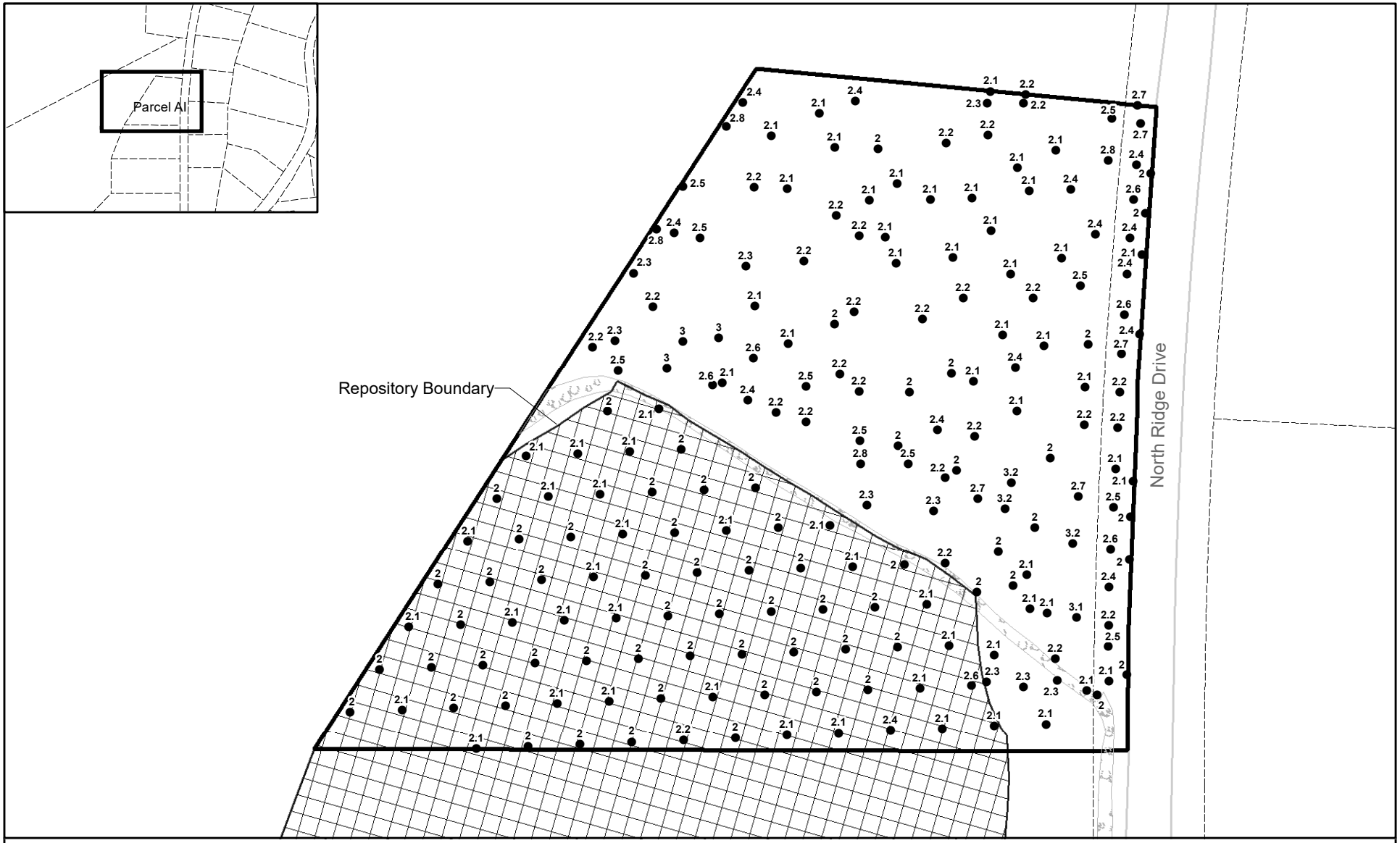
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Swimming Pool Repository
Parcel AG

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_AG_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Oversized Material

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

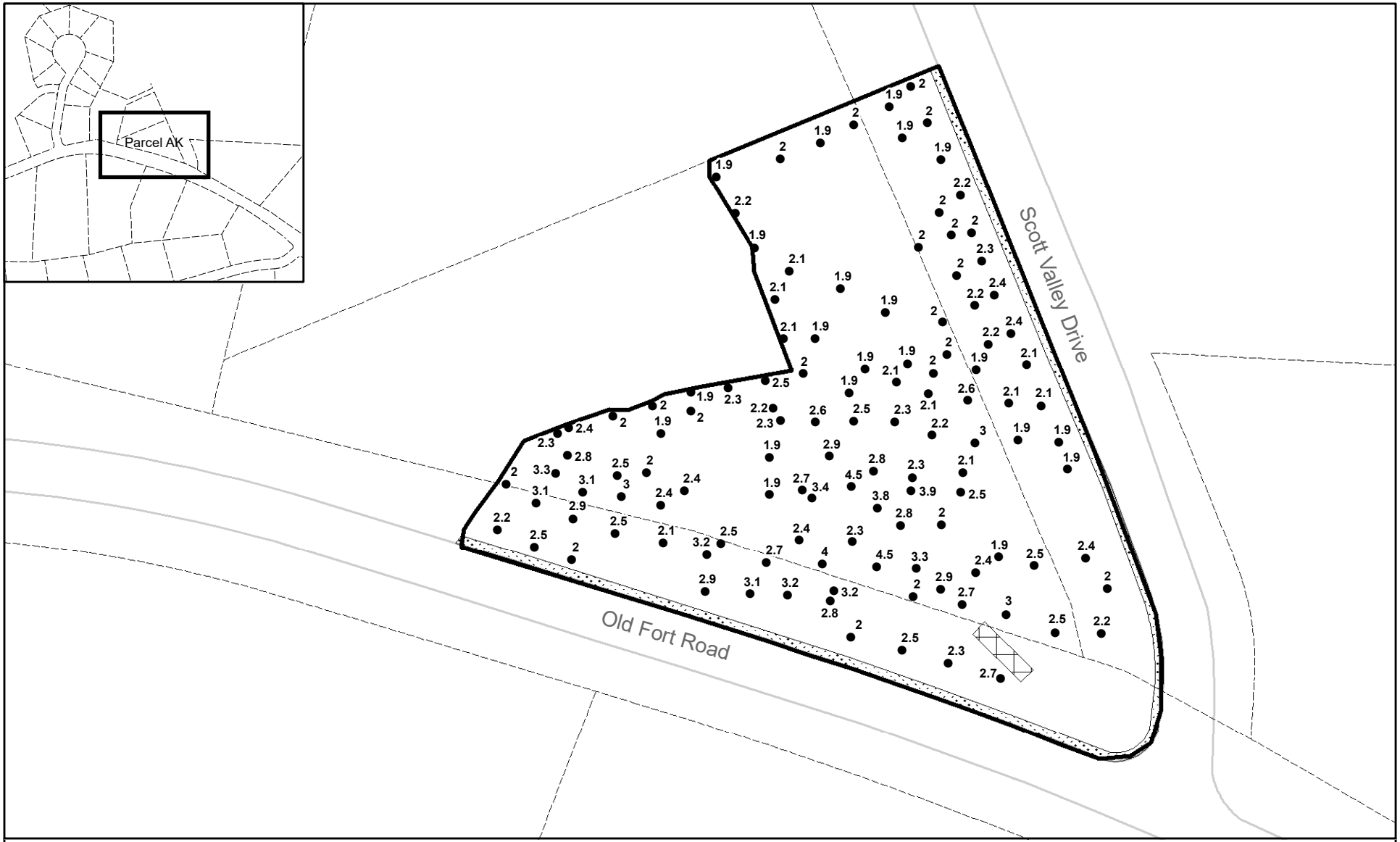
N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Swimming Pool Repository
Parcel AI

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_AI_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Gravel

Note: Protective liner installed under covered decks and in crawlspaces.

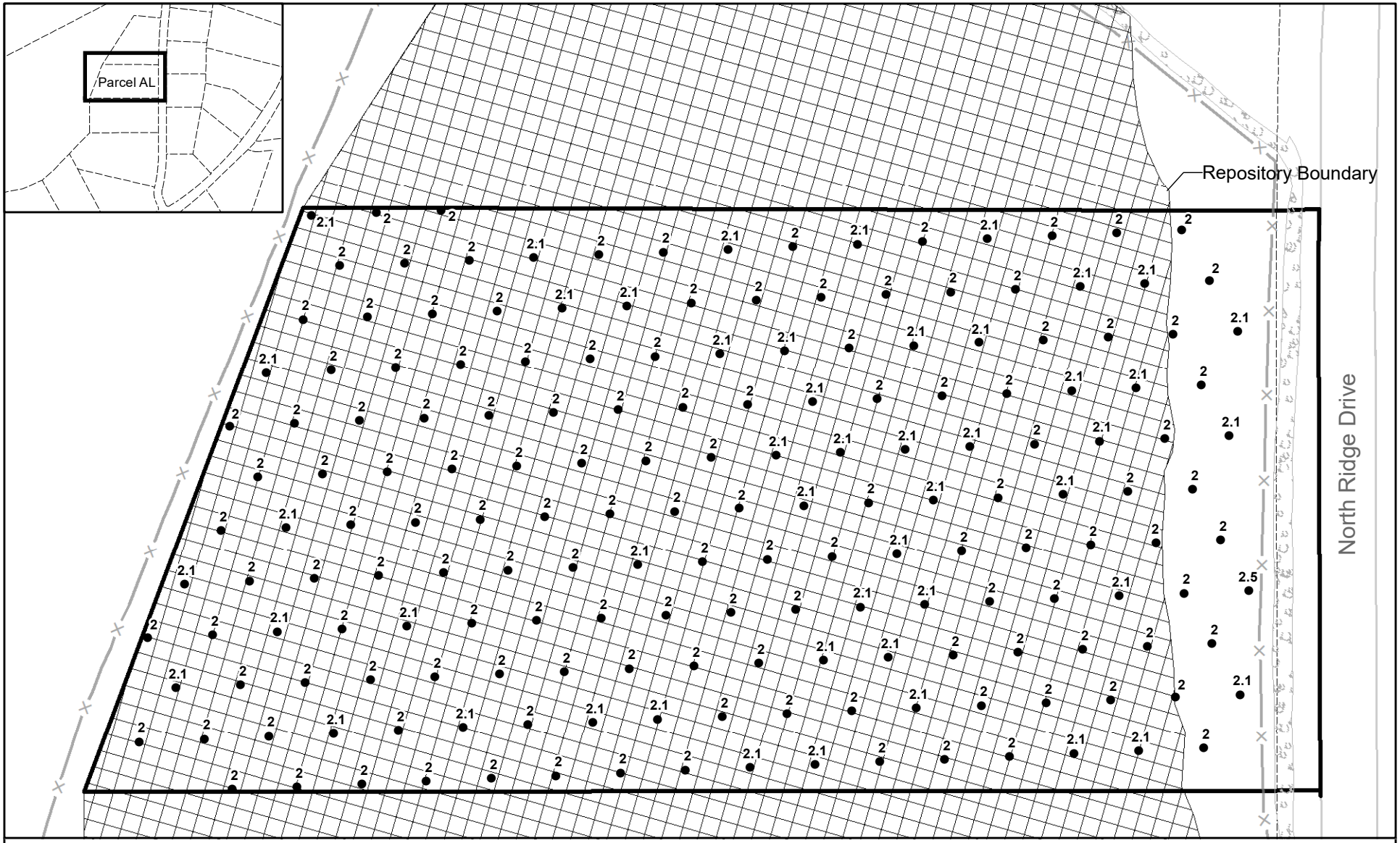
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3721 Scott Valley Drive
Parcel AK

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_AK_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Swimming Pool Repository
Parcel AL

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_AL_inset.mxd

Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Structure
- Gravel

Note: Protective liner installed under covered decks and in crawlspaces.

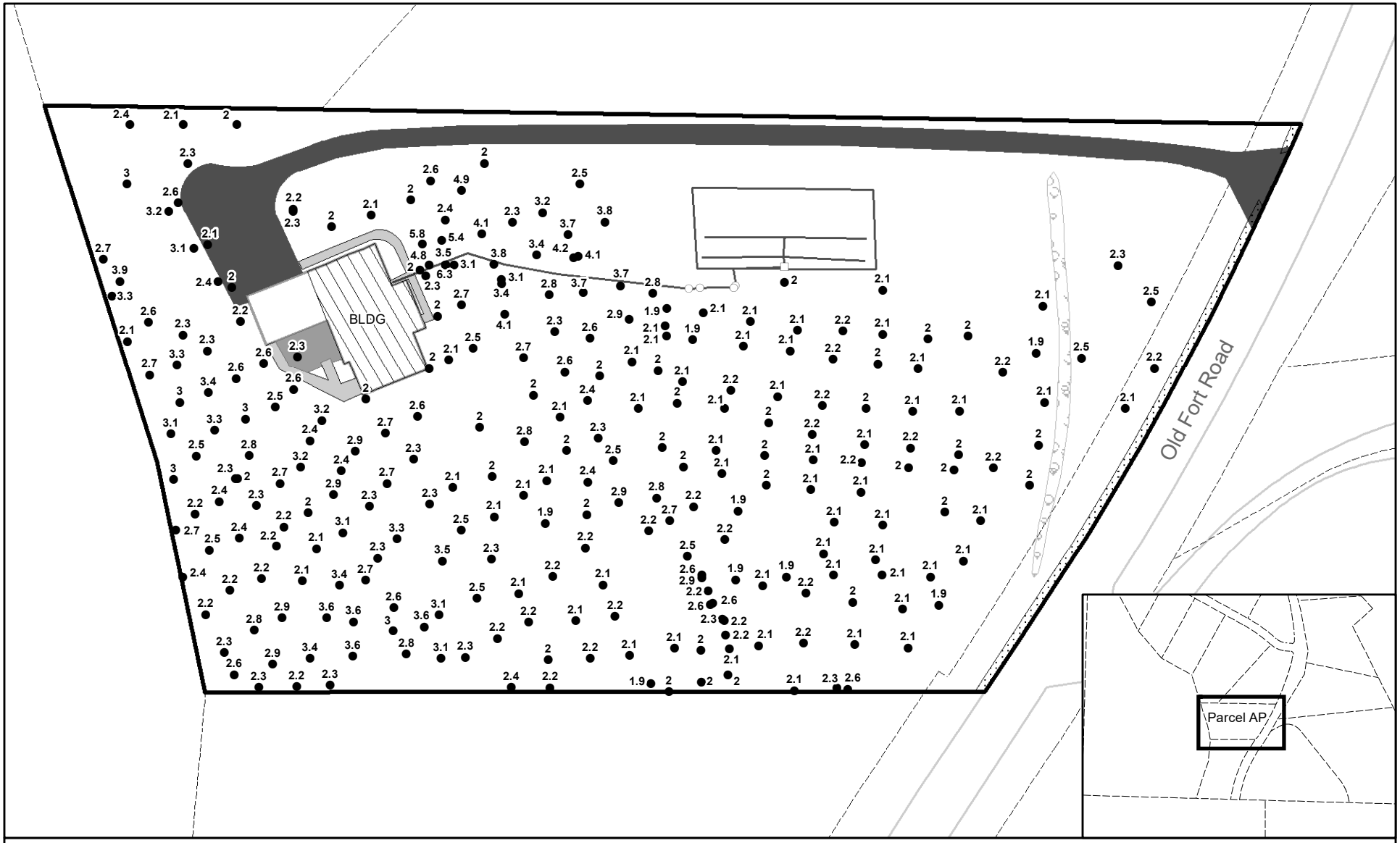
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3451 Old Fort Road
Parcel AM

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_AM_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

Existing concrete garage floor slab was left in place. ACM may be present beneath this protective cap.

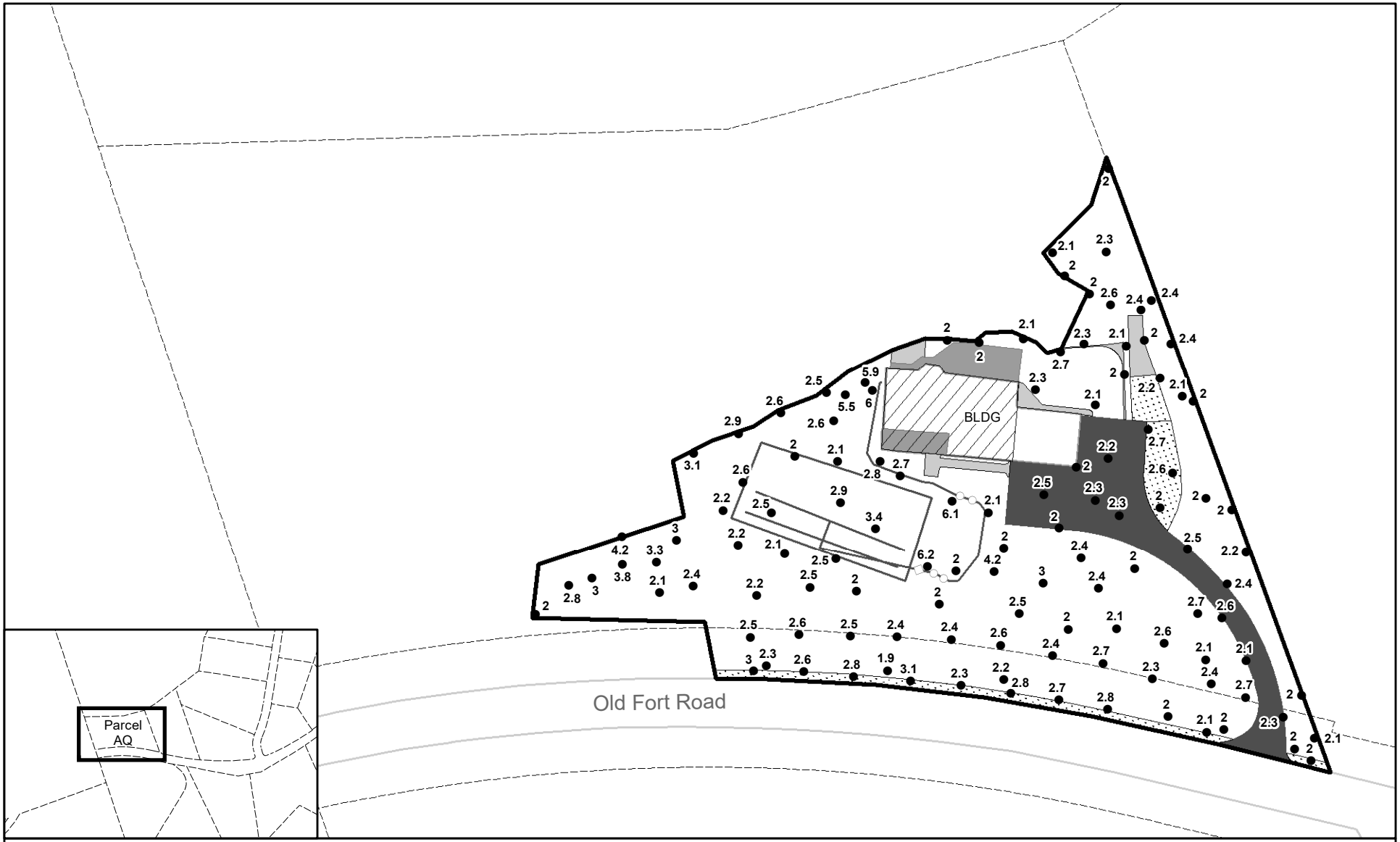
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
2840 Old Fort Road
Parcel AP

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_AP_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner

Note: Protective liner installed under covered decks and in crawlspaces.

Existing concrete garage floor slab was left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
2720 Old Fort Road
Parcel AQ

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_AQ_inset.mxd

Legend

- Depth of Cap (Ft)
- Excavation Boundary
- Tree
- Parcel Boundary

Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

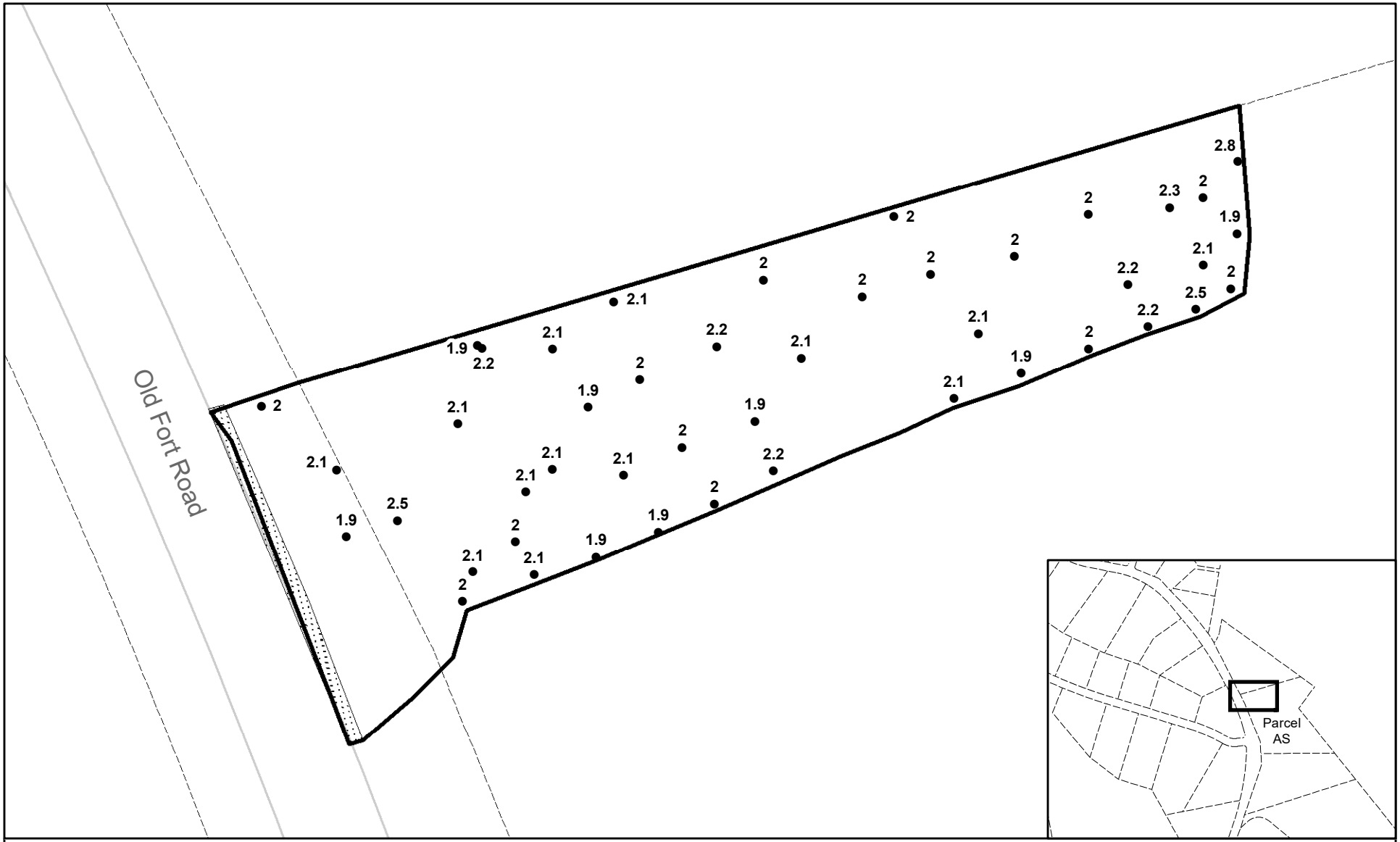
N

0 25 50

Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
2725 Old Fort Road
Parcel AR

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_AR_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Gravel

Note: Protective liner installed under covered decks and in crawlspaces.

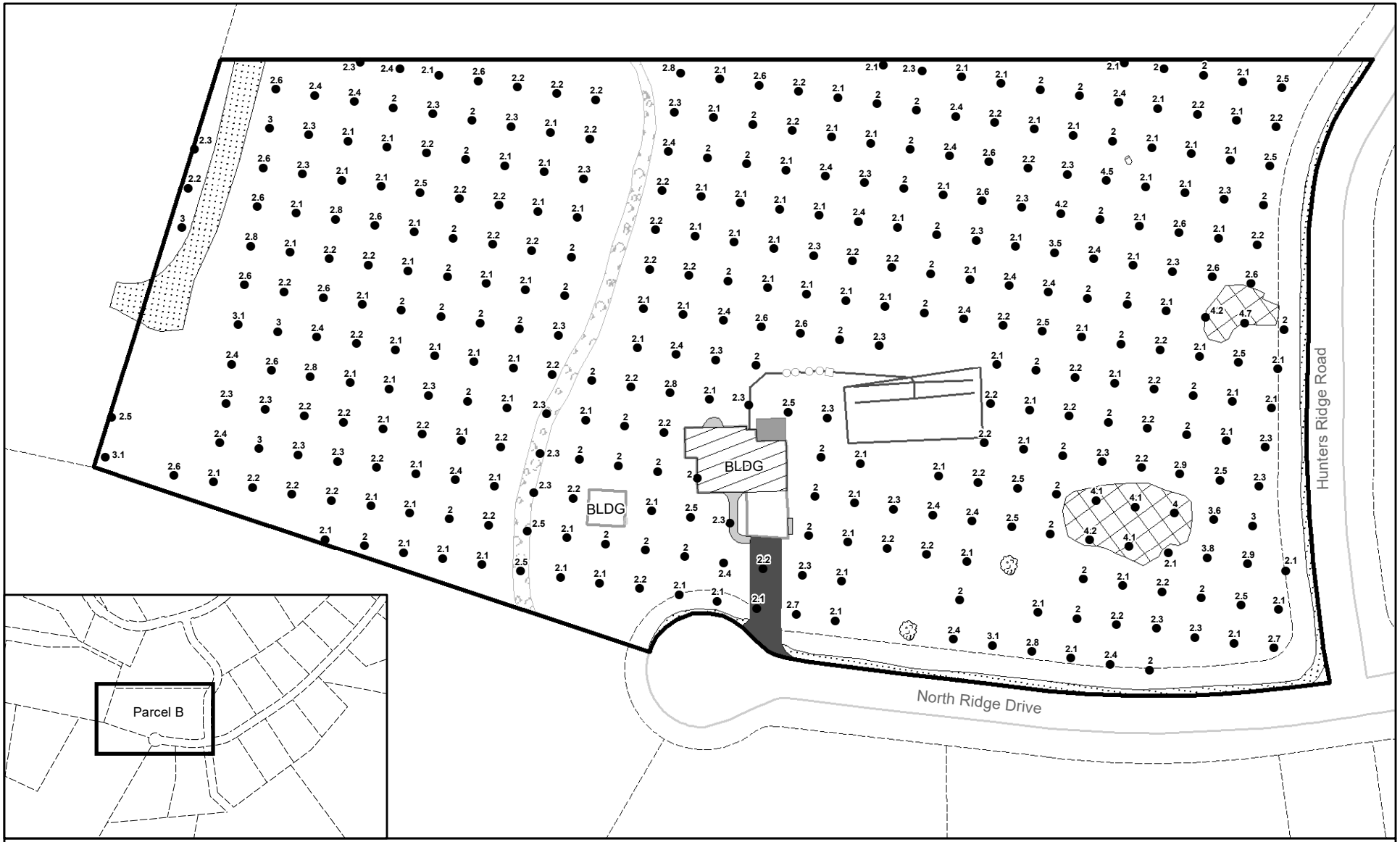
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Parcel AS

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_AS_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Existing concrete garage floor slabs were left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

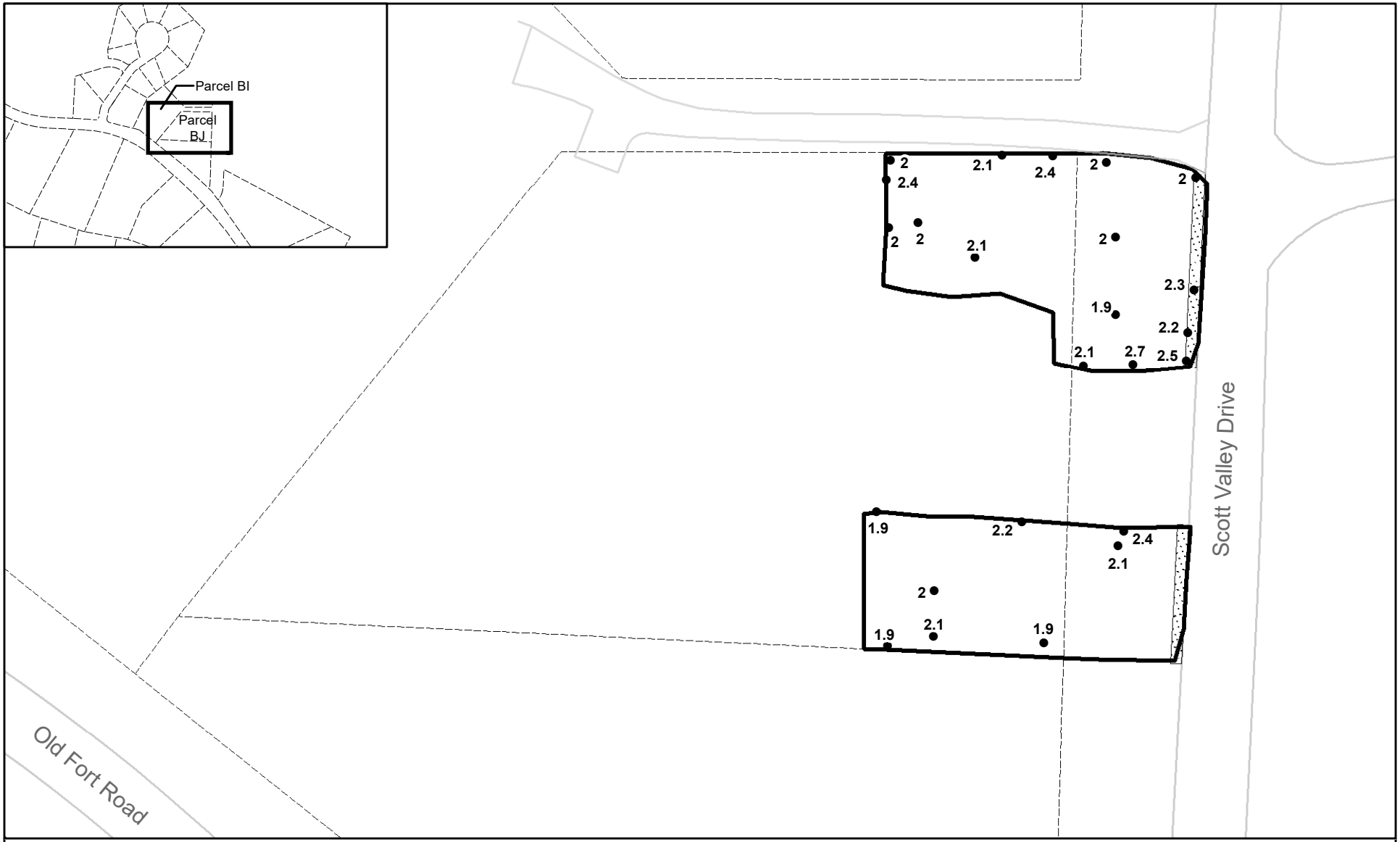
N

0 25 50 100
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3433 North Ridge Drive
Parcel B

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_B_inset.mxd



Legend

- Depth of Cap (Ft)
- Excavation Boundary
- Tree
- Gravel
- Parcel Boundary

Note: Protective liner installed under covered decks and in crawlspaces.

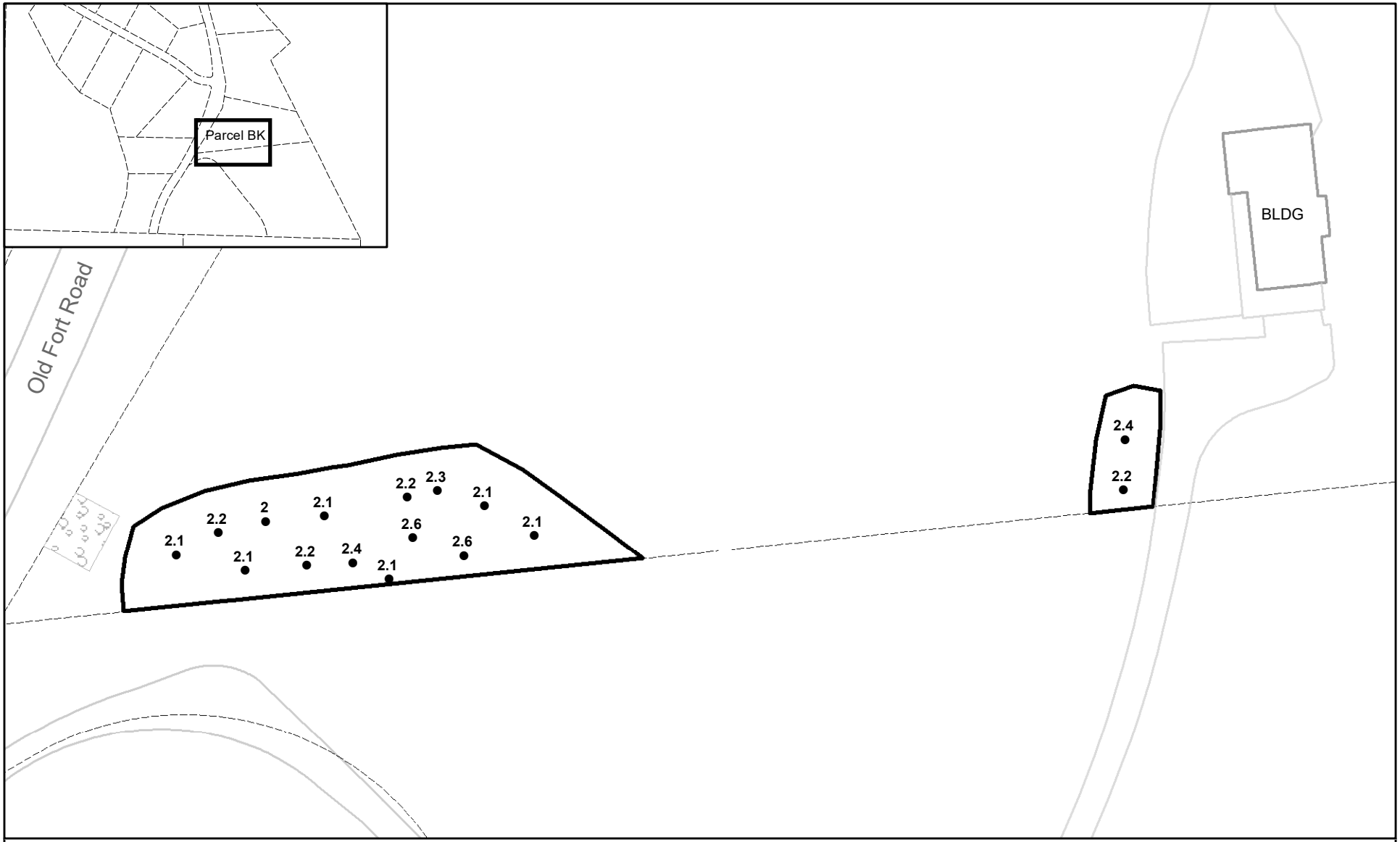
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3721 Scott Valley Drive
Parcel BI/BJ

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_BJ_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Structure
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

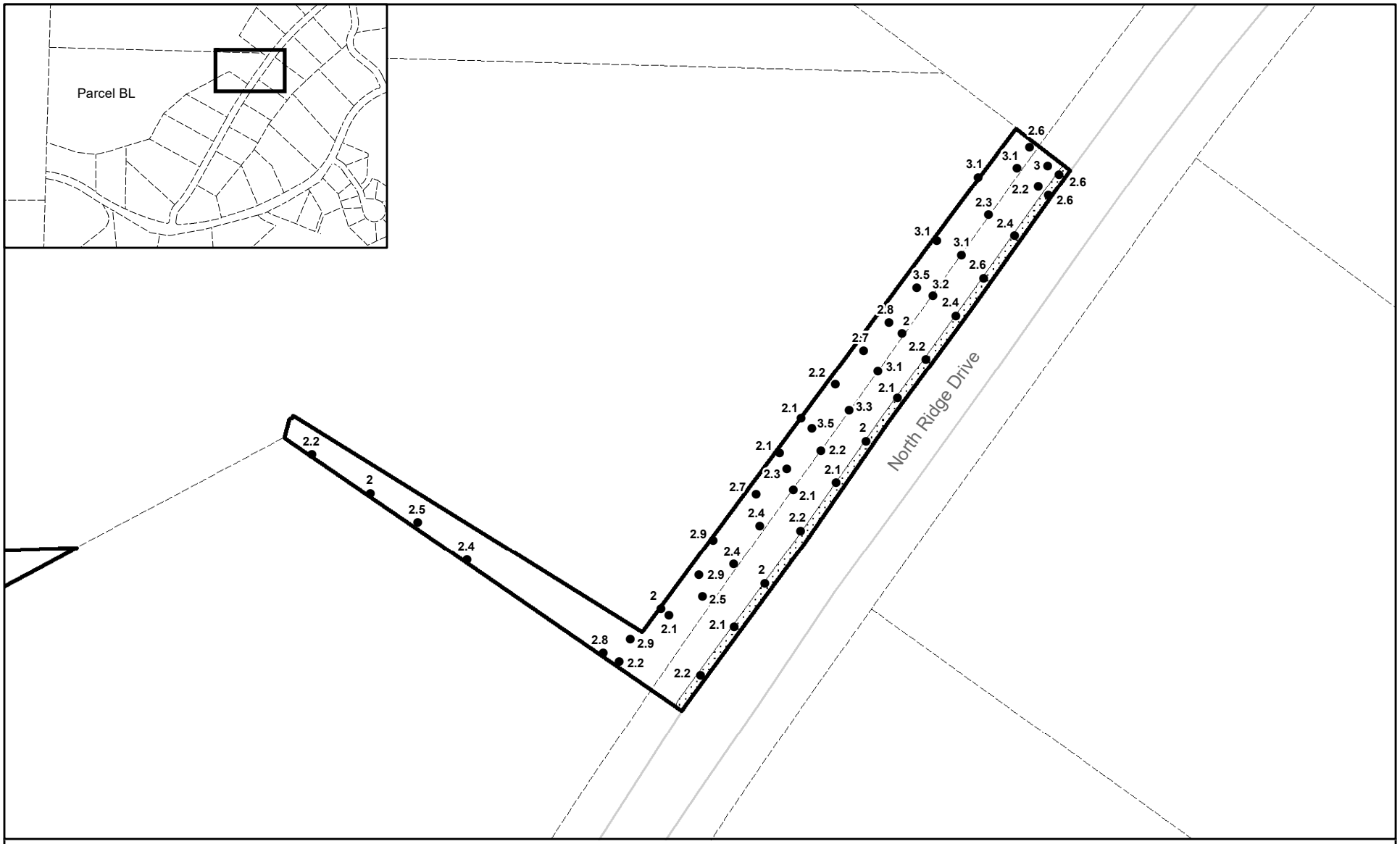
N

0 25 50

Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
2727 Old Fort Road
Parcel BK

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_BK_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Gravel

Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

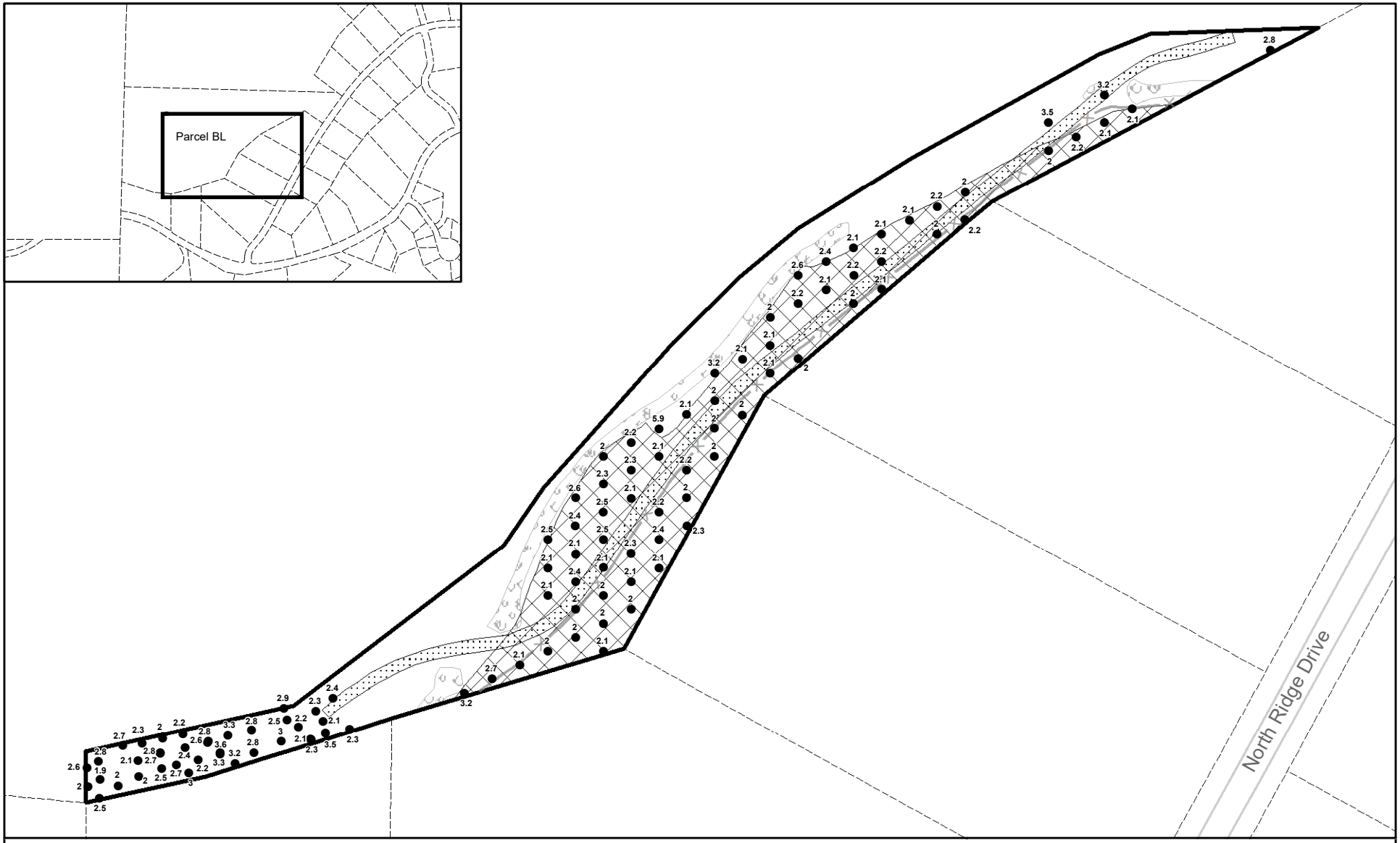
N

0 25 50

Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
2840 Old Fort Road
Parcel BL - Sheet 1 of 2

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_BL1_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Gravel
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

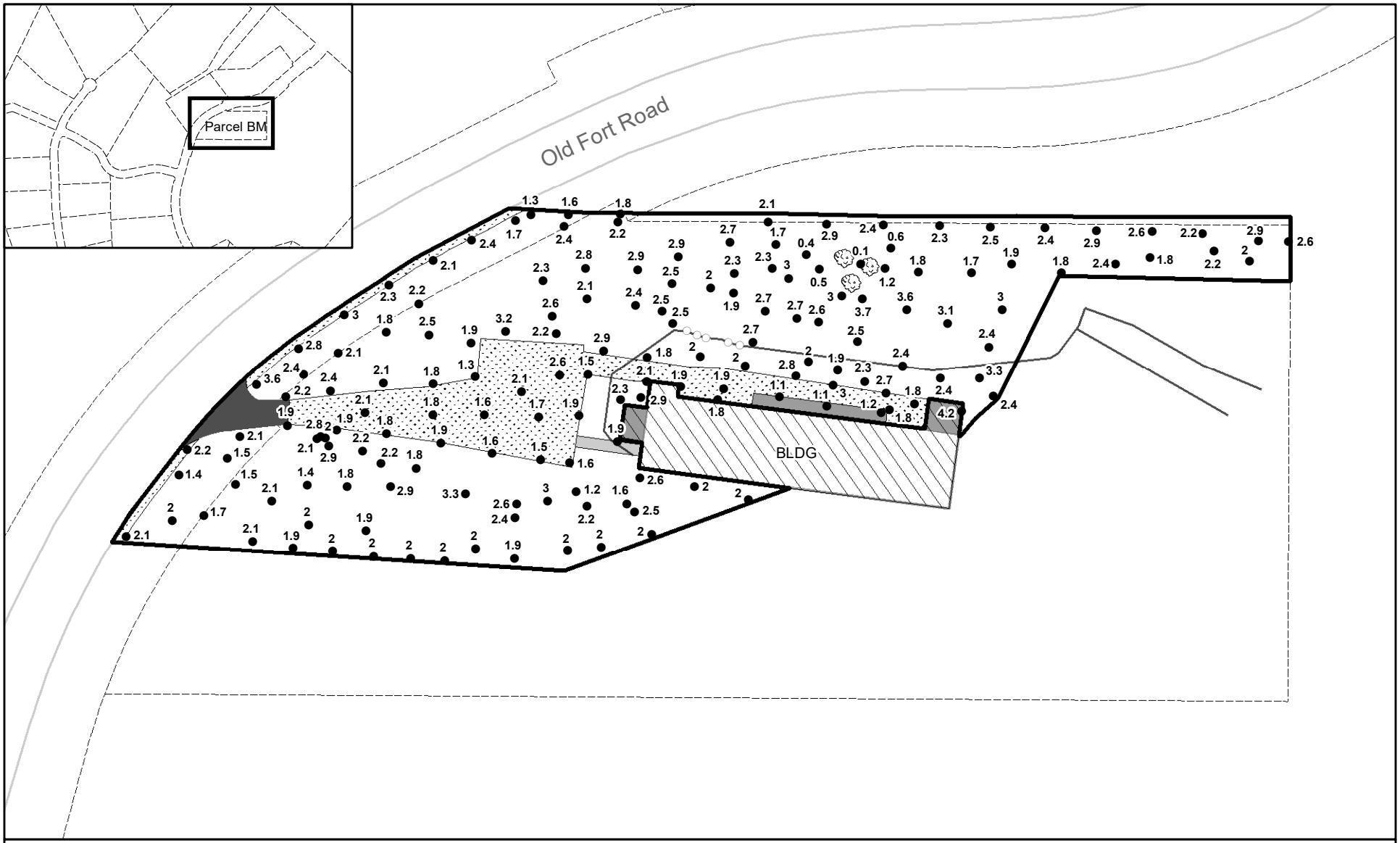
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50 100
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
2840 Old Fort Road
Parcel BL - Sheet 2 of 2

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_BL2_Inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner

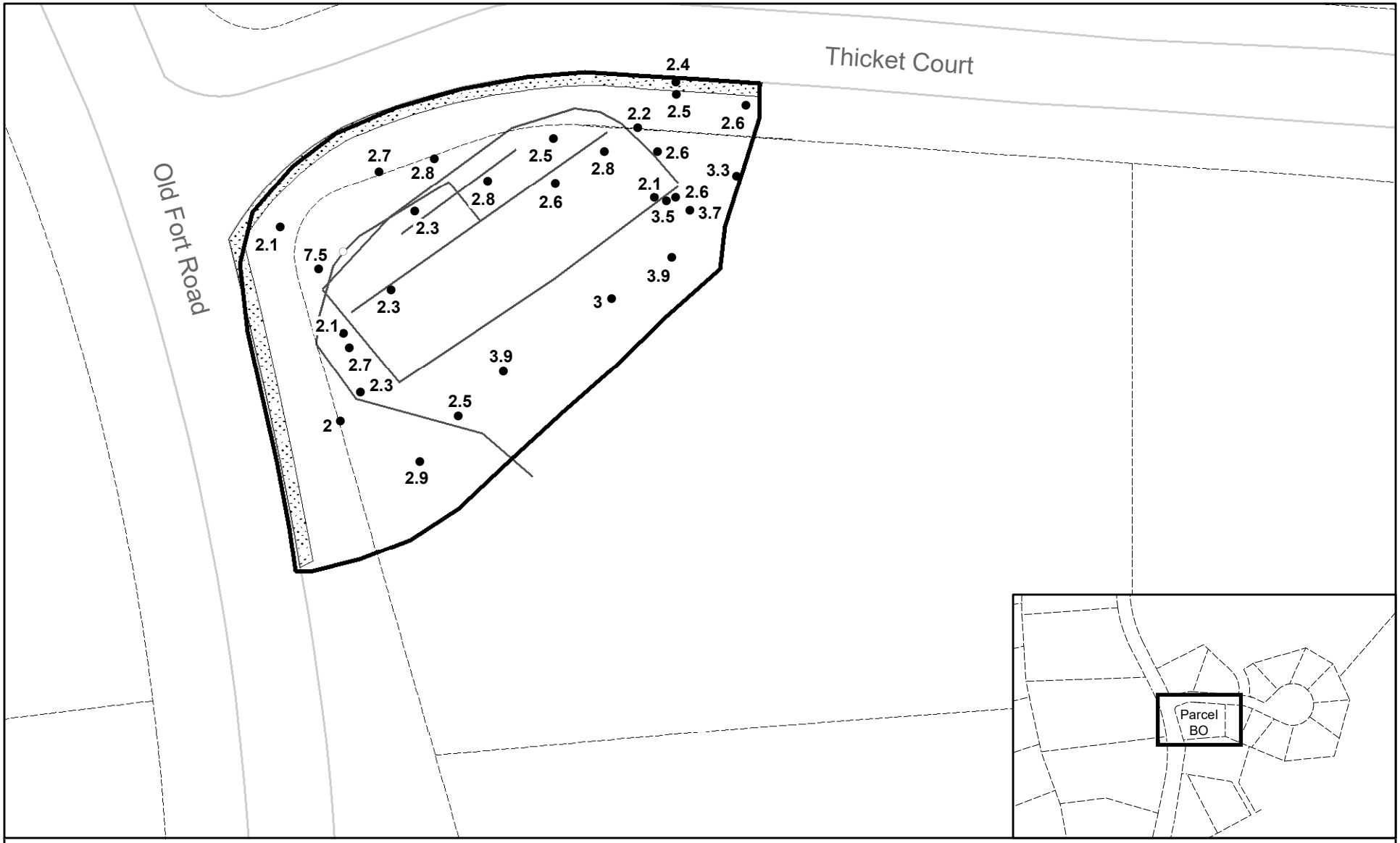
Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
4343 Old Fort Road
Parcel BM

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_BM_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Gravel

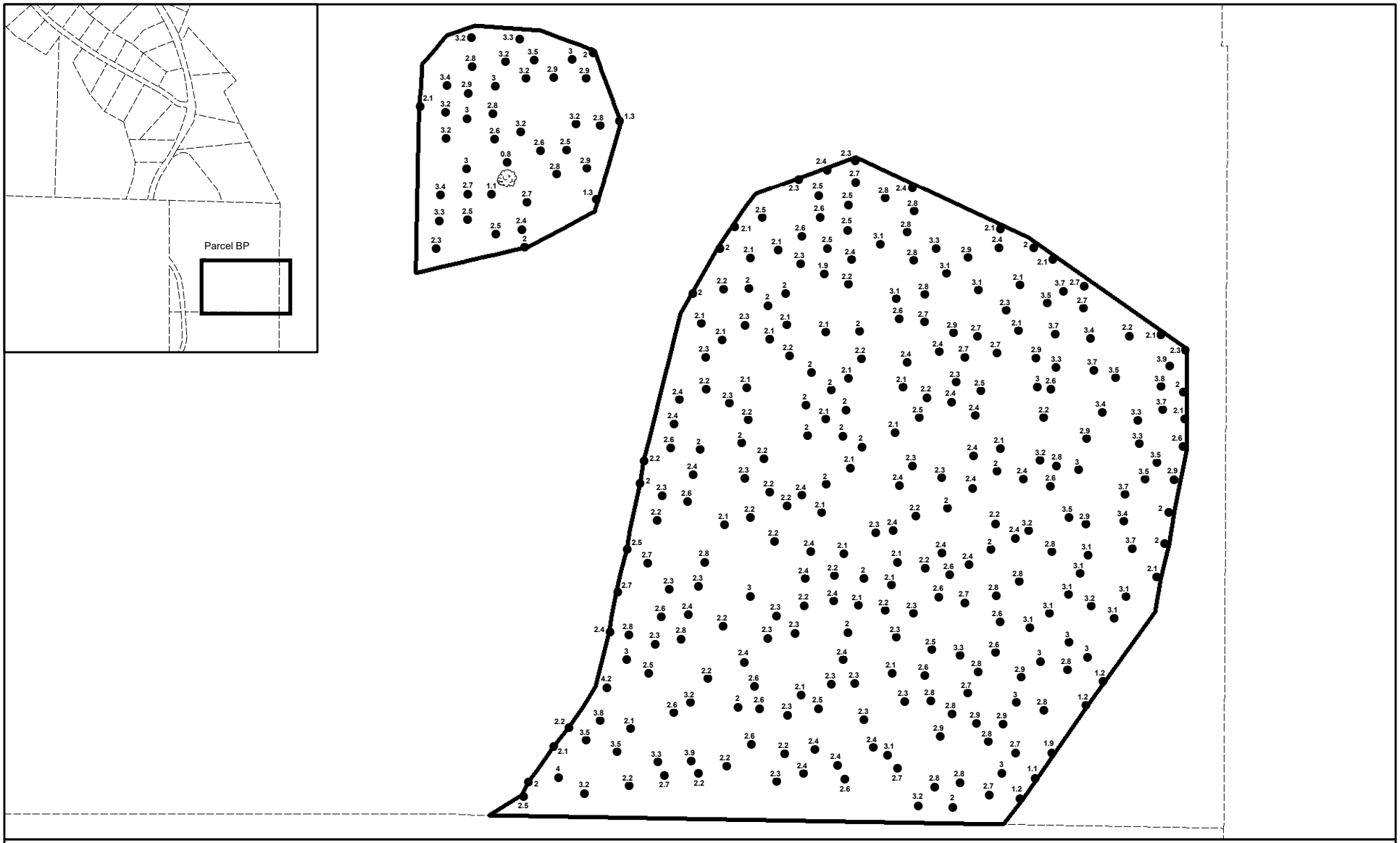
Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3710 Thicket Court
Parcel BO

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_BO_inset.mxd



Legend

- Depth of Cap (Ft)
- Excavation Boundary
- Tree
- Parcel Boundary

Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

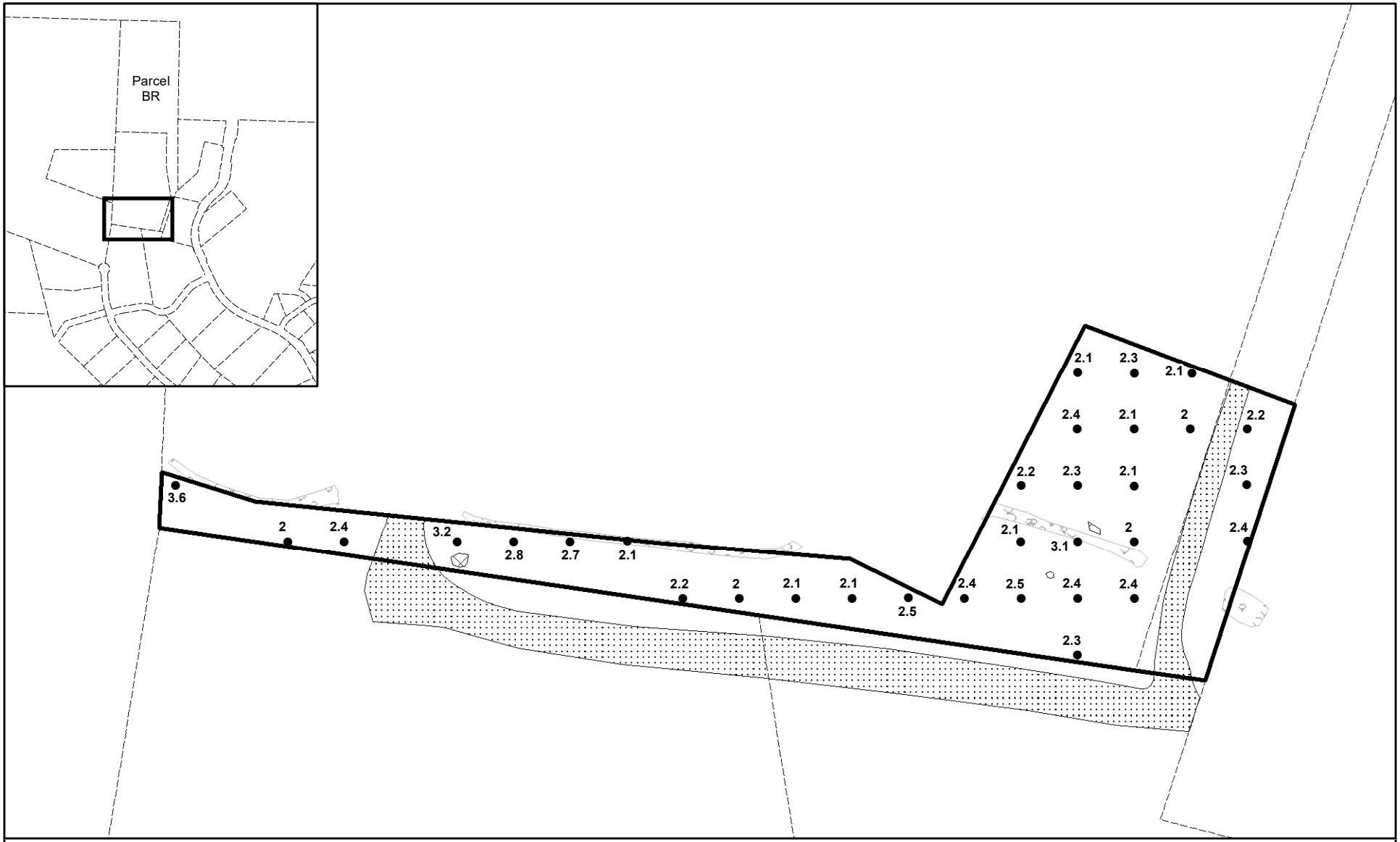
N

0 25 50 100

Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
2737 Old Fort Road
Parcel BP

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_BP_inset.mxd



Legend

- Depth of Cap (Ft)
- Excavation Boundary
- Gravel
- Tree
- Marker Barrier
- Oversized Material
- Parcel Boundary

Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

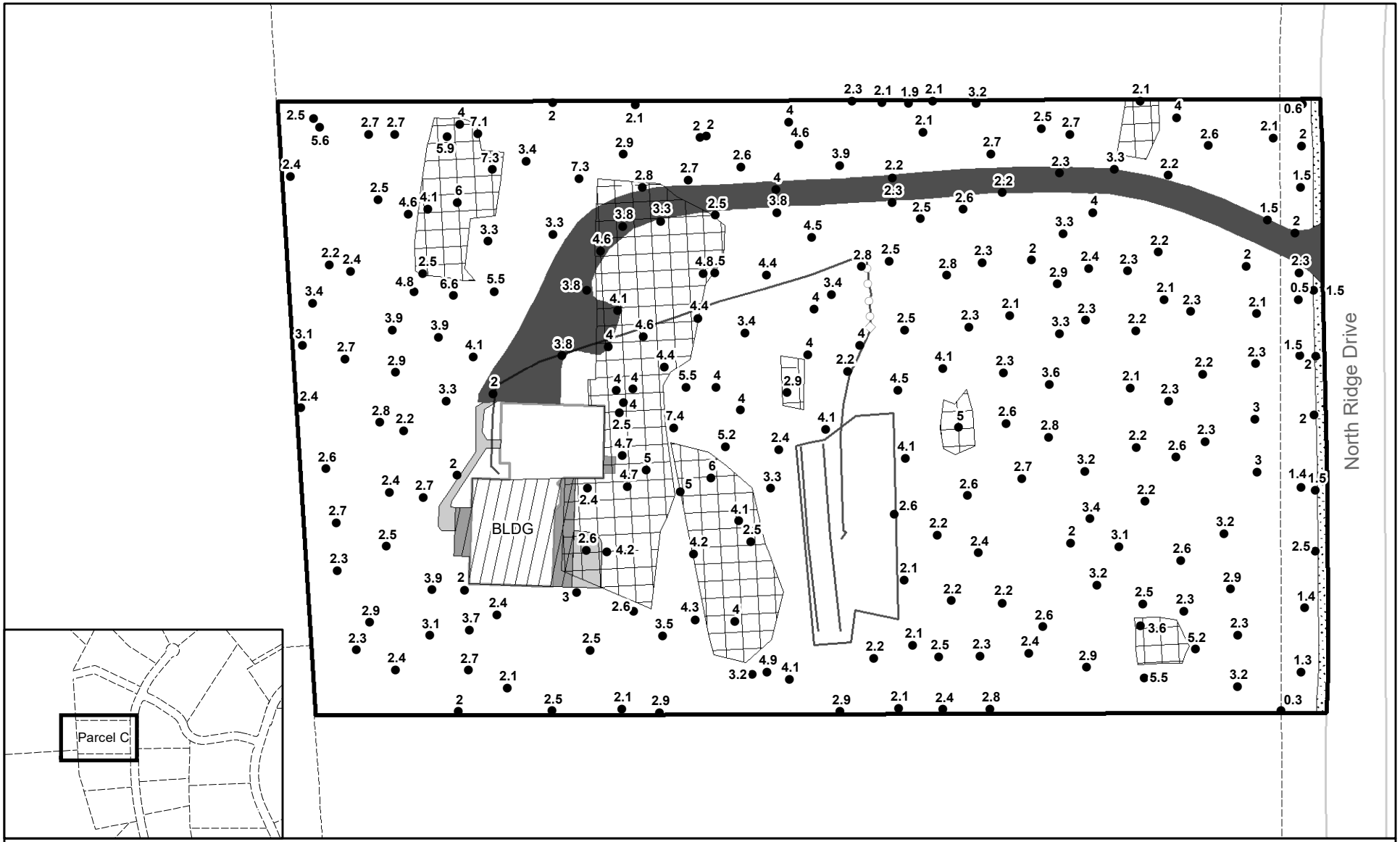
N

0 25 50

Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3510 Jasma Lane
Parcel BR

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_BR_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner

Note: Protective liner installed under covered decks and in crawlspaces.

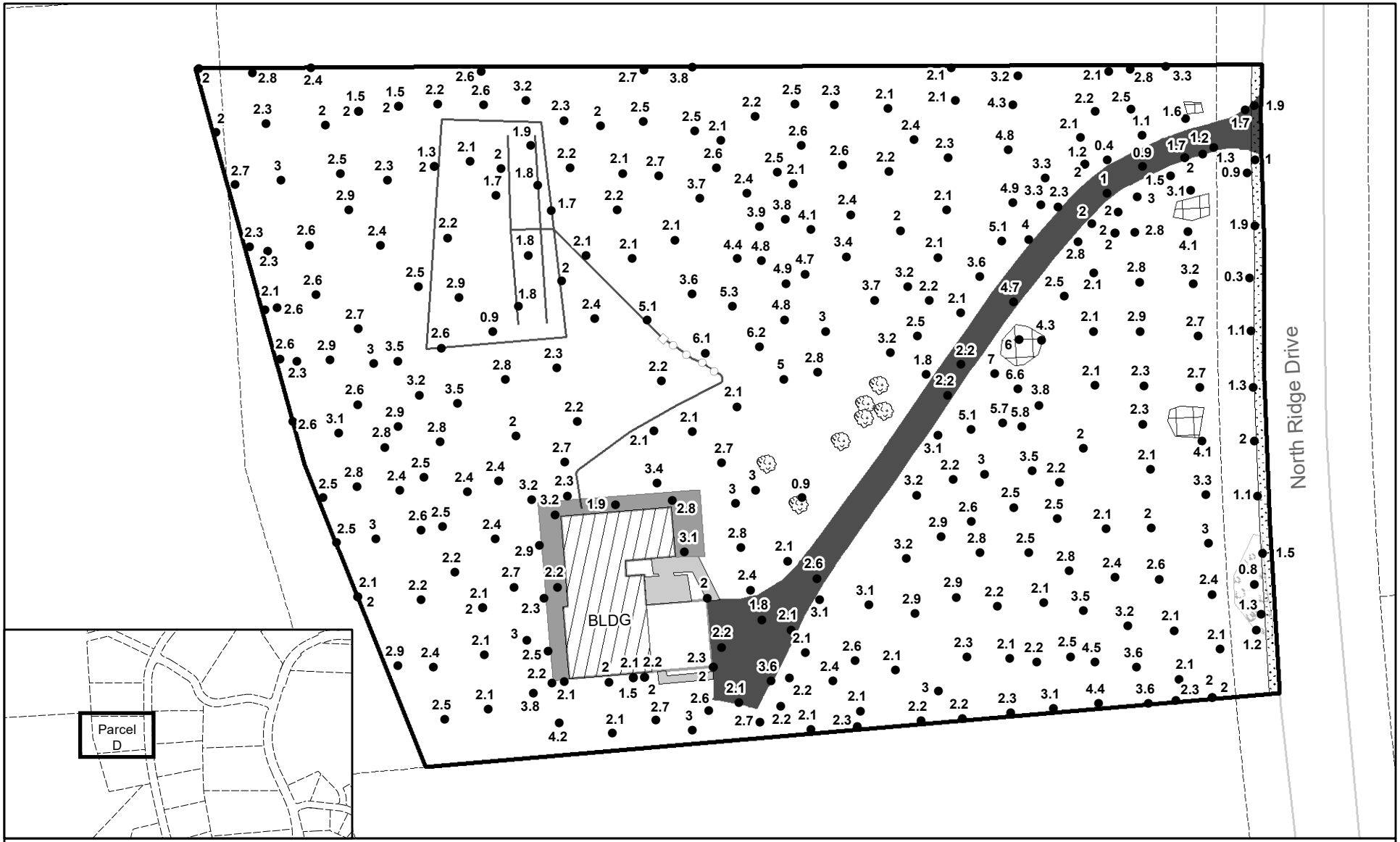
Existing concrete garage floor slab was left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3508 North Ridge Drive
Parcel C

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_C_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Existing concrete garage floor slab was left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3514 North Ridge Drive
Parcel D

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_D_inset.mxd

Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Asphalt
- Structure
- Gravel
- Liner

Note: Protective liner installed under covered decks and in crawlspaces.

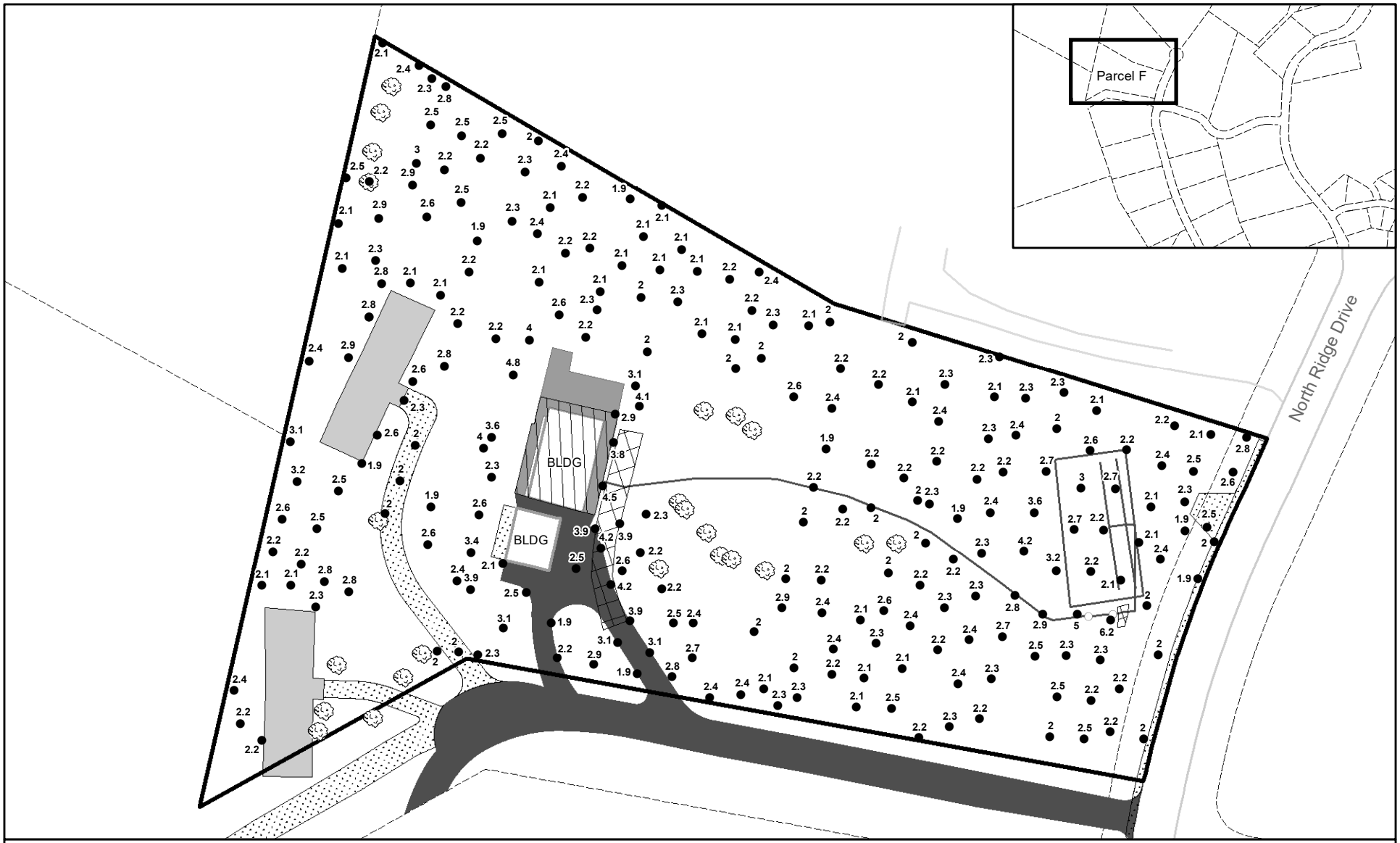
Existing concrete garage floor slab was left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3502 North Ridge Drive
Parcel E

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_E_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner

Note: Protective liner installed under covered decks and in crawlspaces.

Existing concrete barrack foundations were in place prior to demolition activities. No ACM is suspected to be present beneath these features.

Existing concrete garage floor slab was left in place. ACM may be present beneath this protective cap.

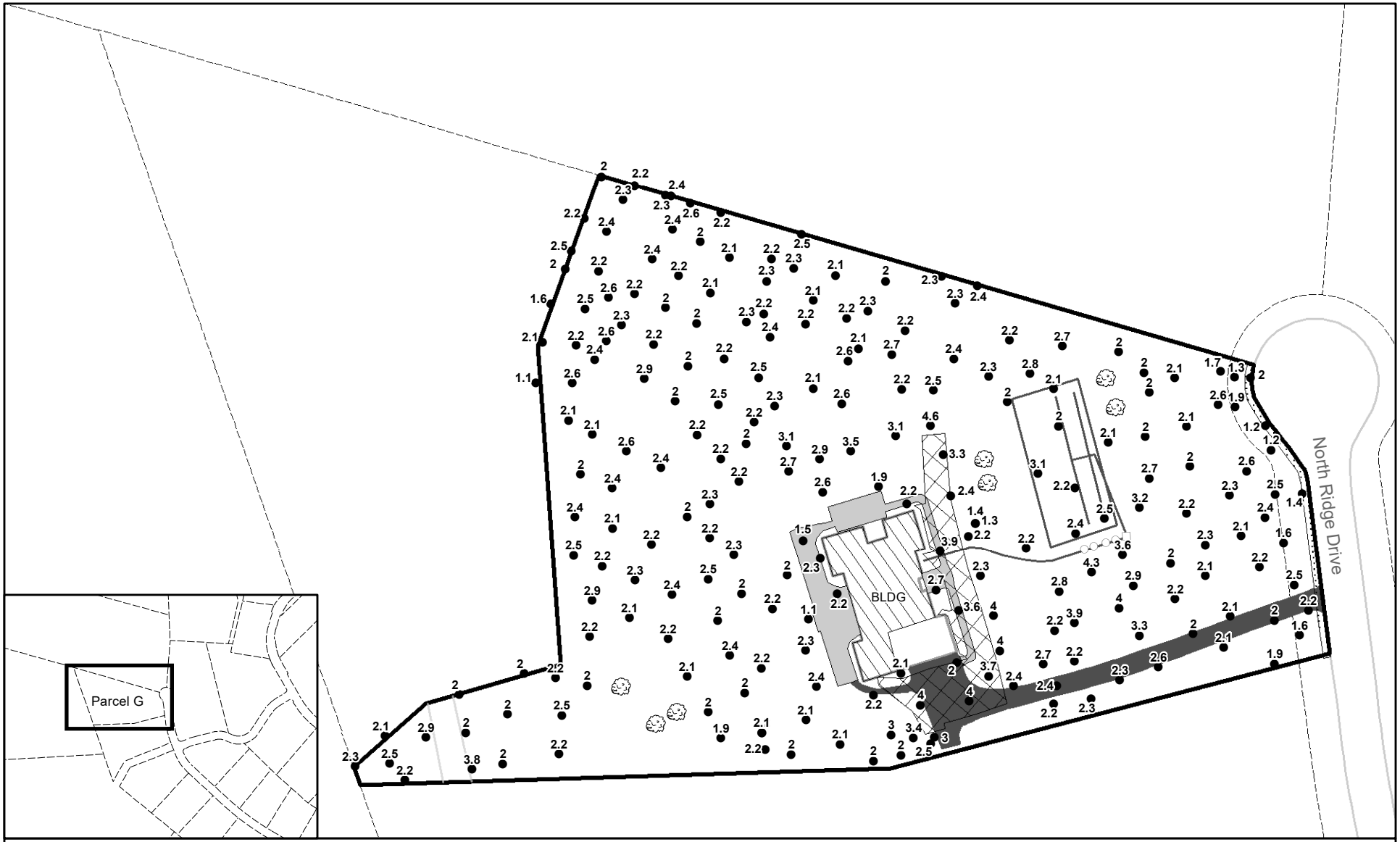
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3440 North Ridge Drive
Parcel F

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_F_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Asphalt
- Structure
- Gravel
- Liner

Note: Protective liner installed under covered decks and in crawlspaces.

Existing concrete garage floor slab was left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

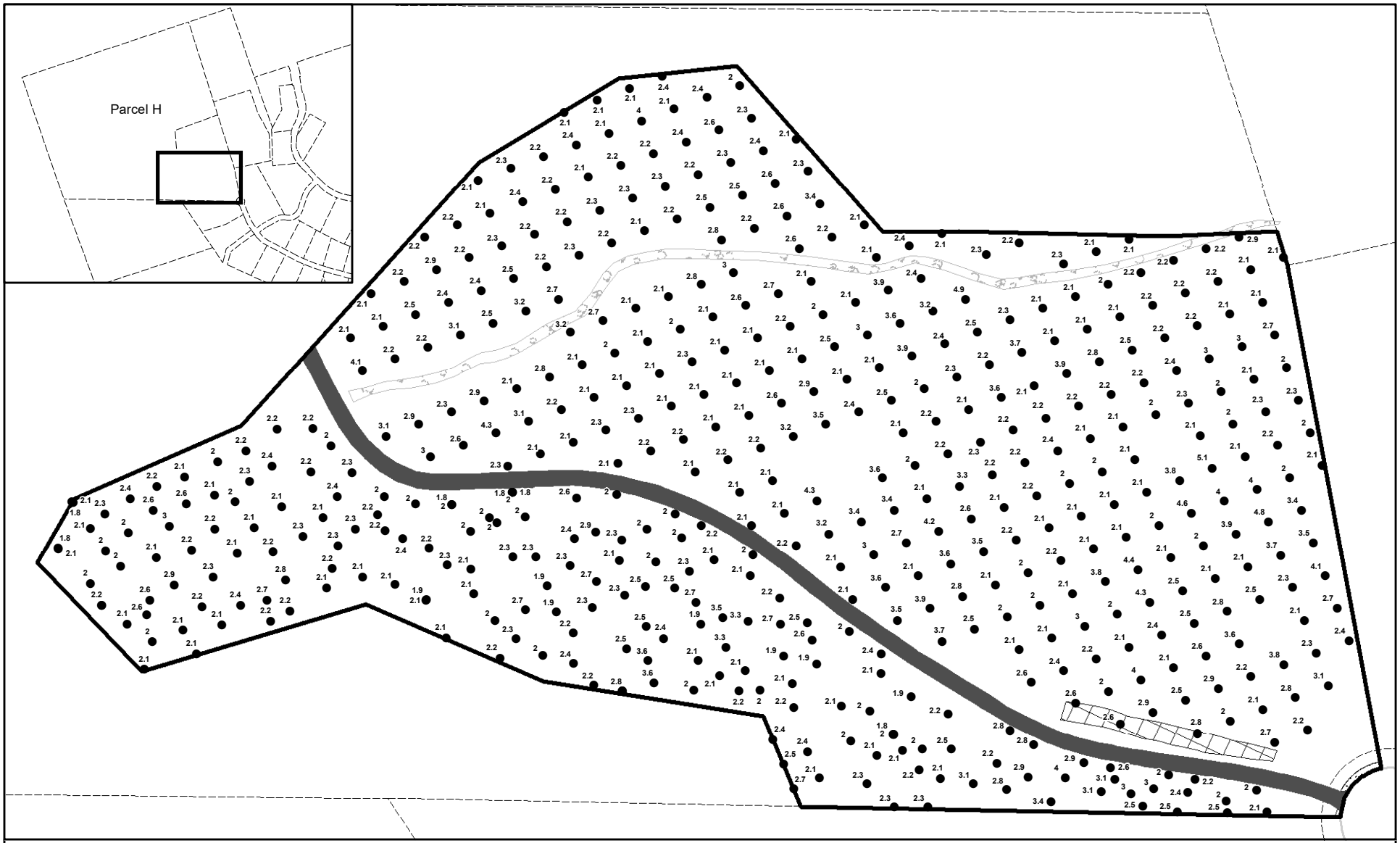
N

0 25 50

Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3434 North Ridge Drive
Parcel G

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_G_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Asphalt
- Gravel
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

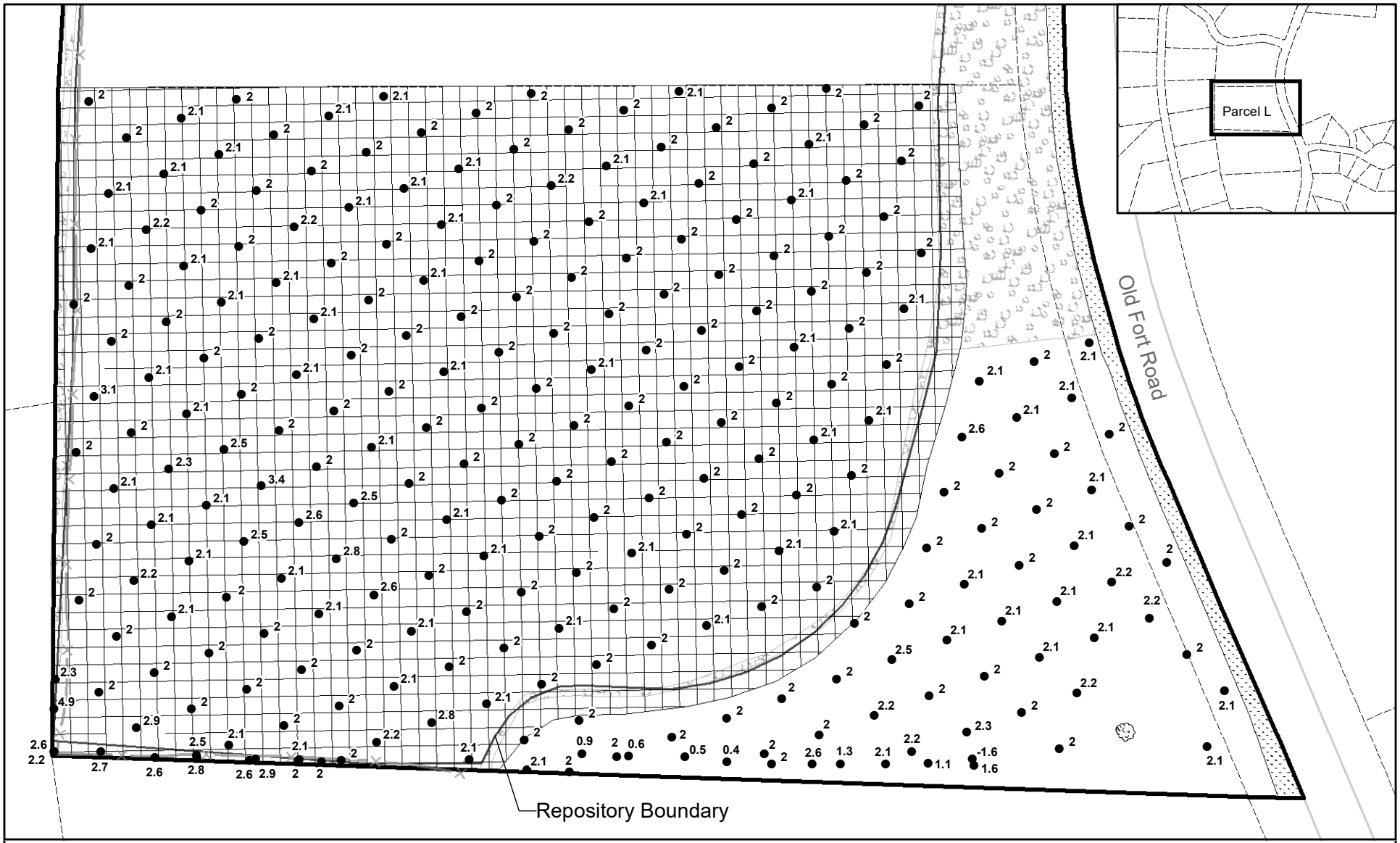
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50 100
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Parcel H

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_H_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Gravel
- Oversized Material

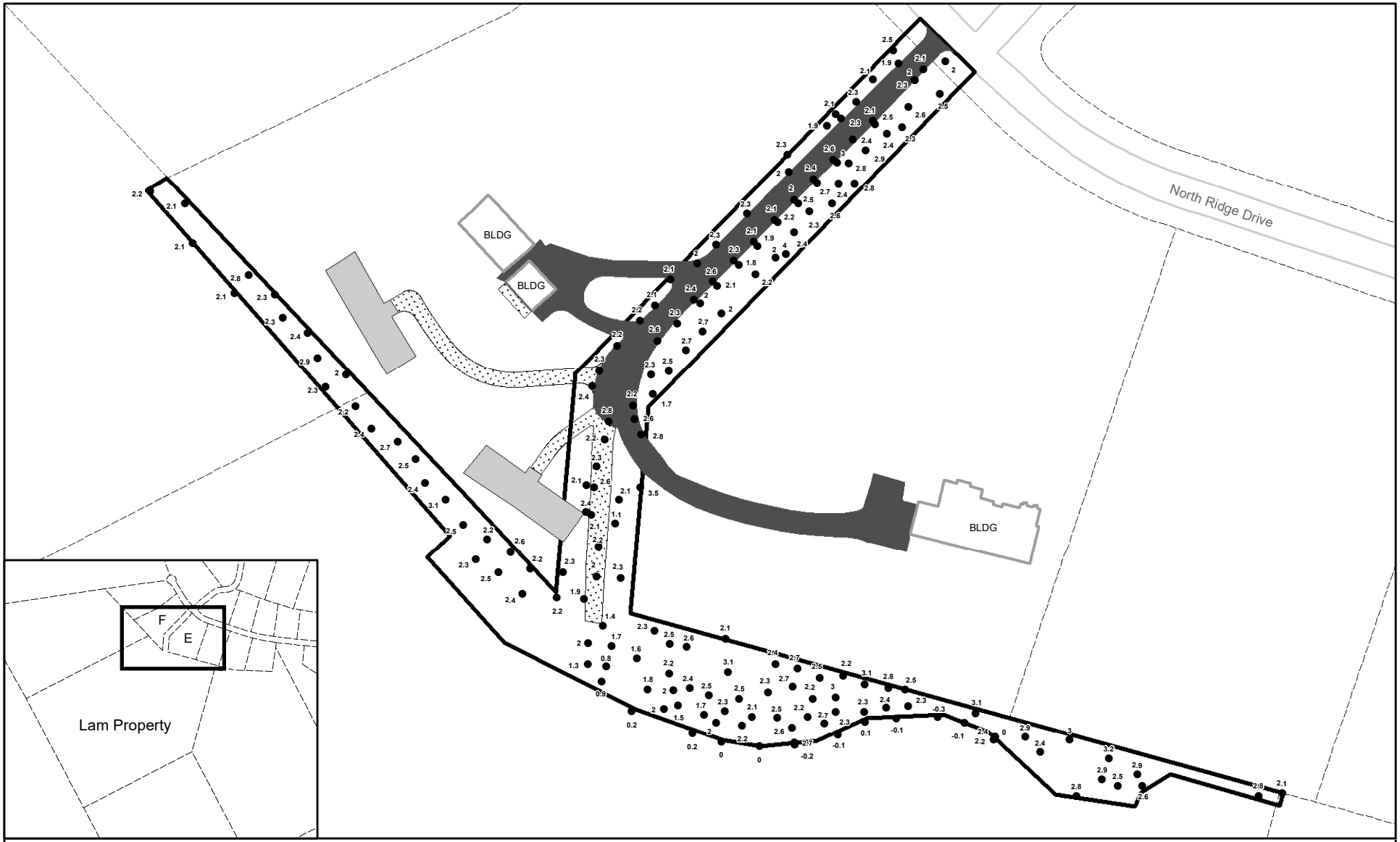
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Memorial Park Repository
Parcel L

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_L_inset.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Roads
- Excavation Boundary
- Concrete
- Asphalt
- Structure
- Gravel

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

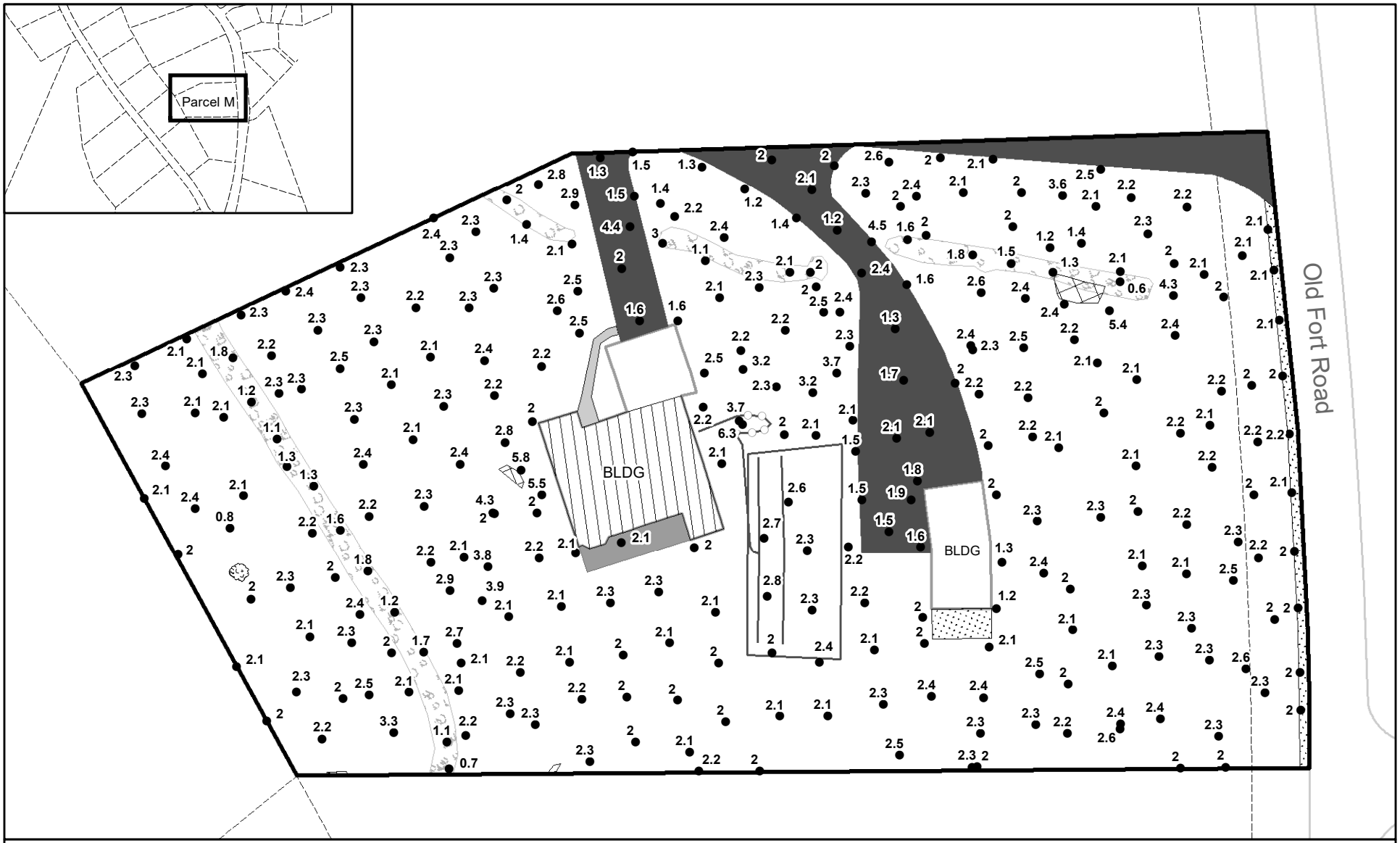
N

0 25 50 100
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Lam Property

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_Lam_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Existing concrete garage floor slabs were left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

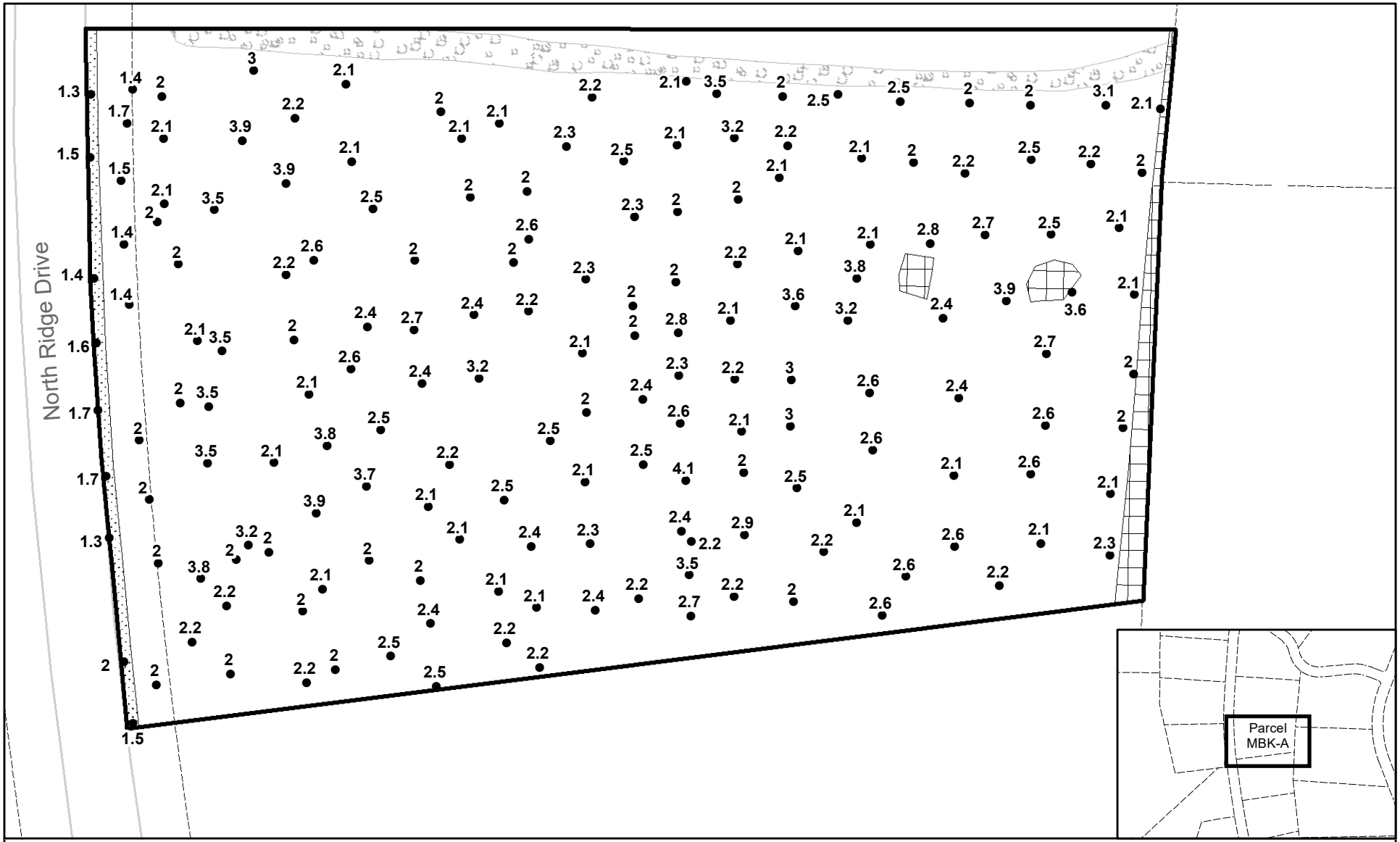
N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3668 Old Fort Road
Parcel M

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_M_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Gravel
- Oversized Material

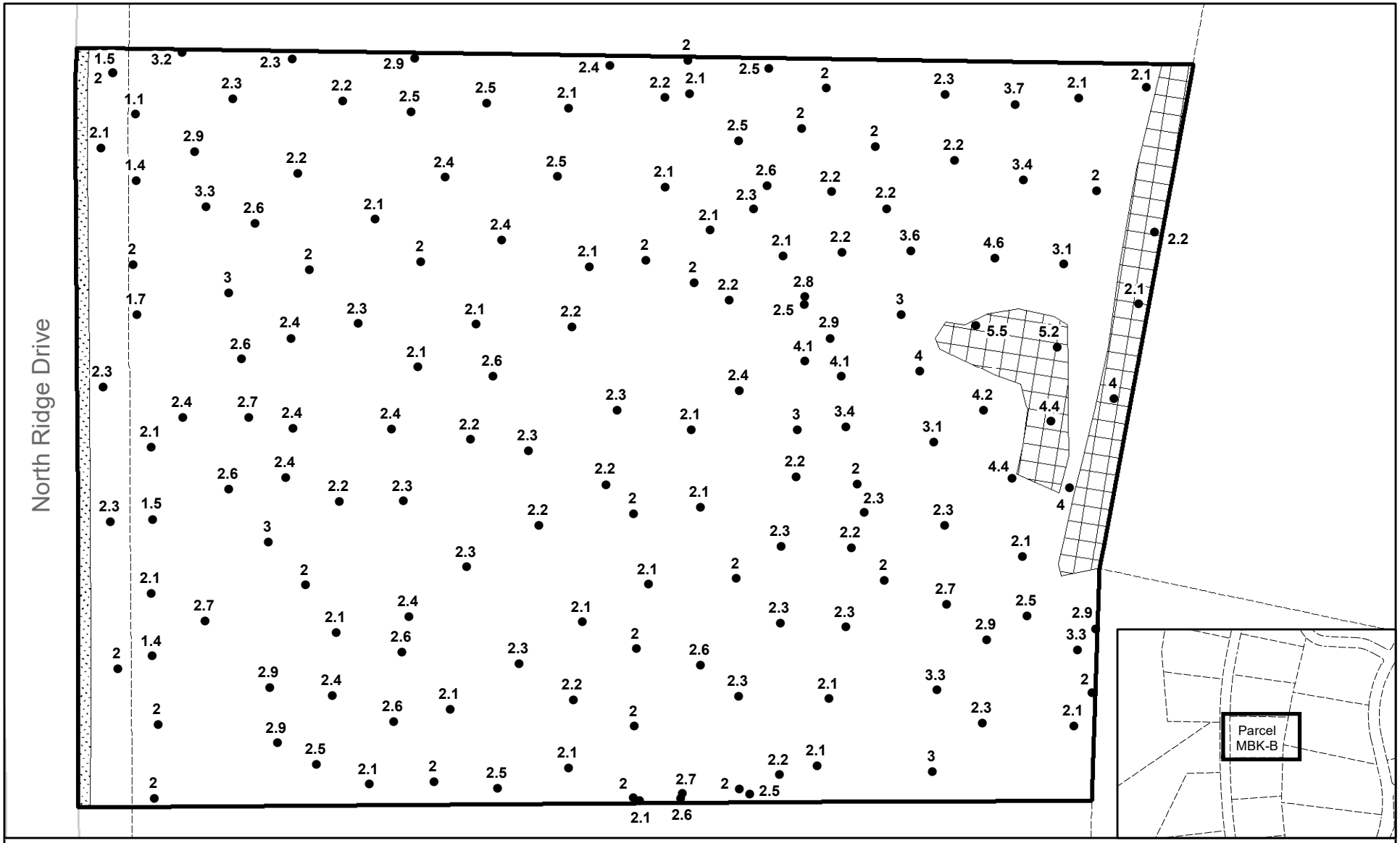
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Parcel MBK-A

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_MBKA_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Gravel

Note: Protective liner installed under covered decks and in crawlspaces.

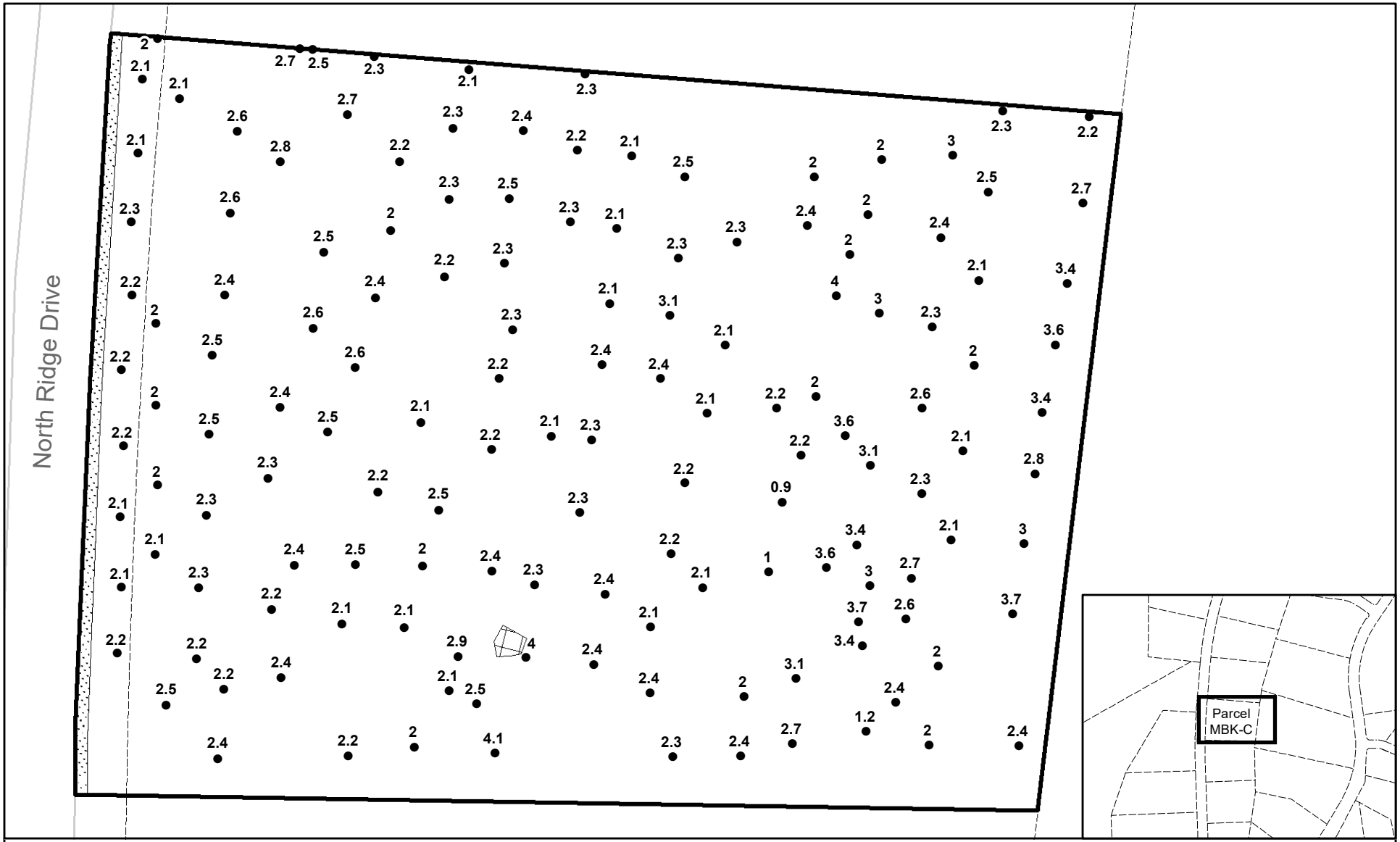
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Parcel MBK-B

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_MBKB_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Gravel

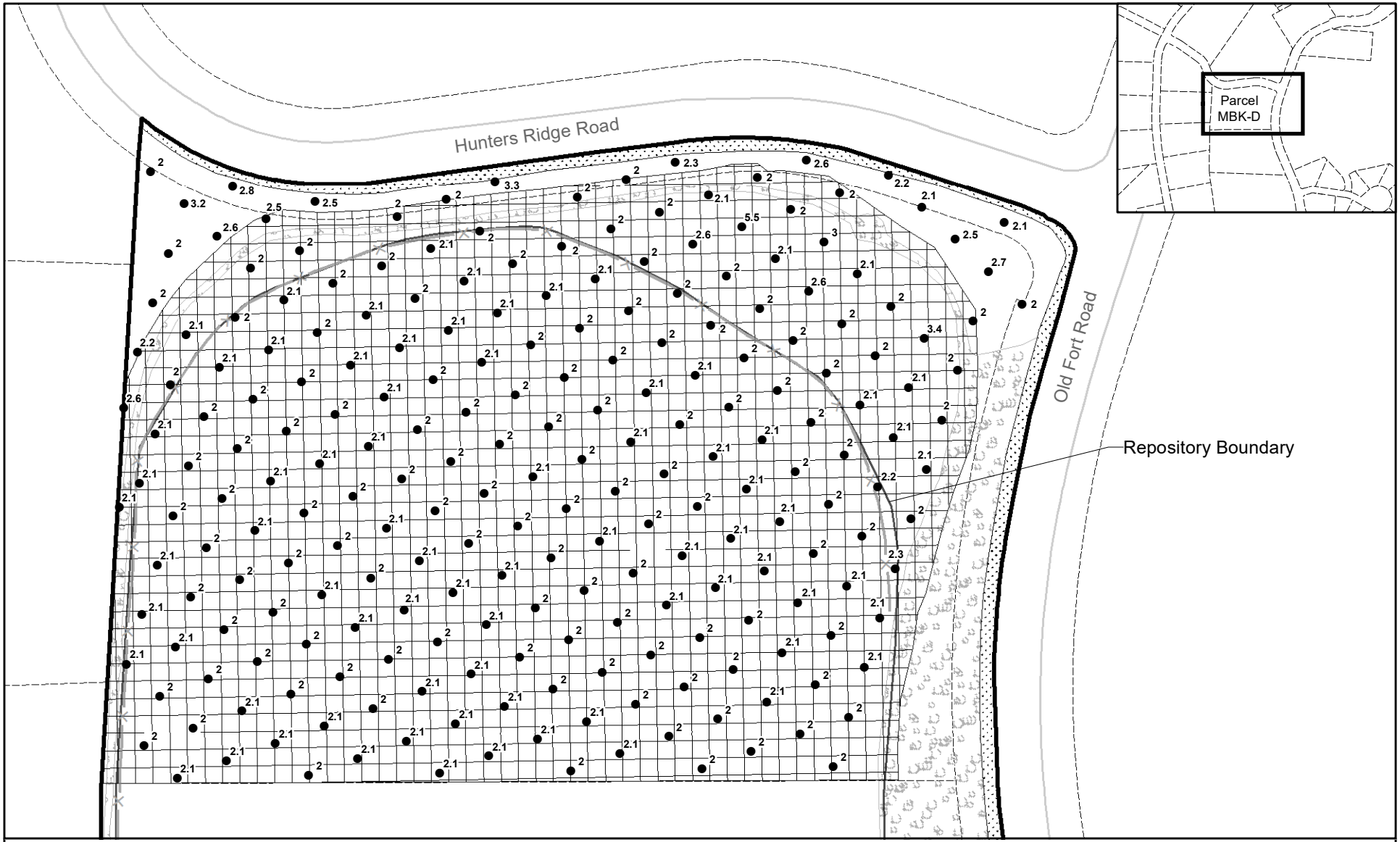
Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Parcel MBK-C

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_MBKC_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Gravel
- Oversized Material

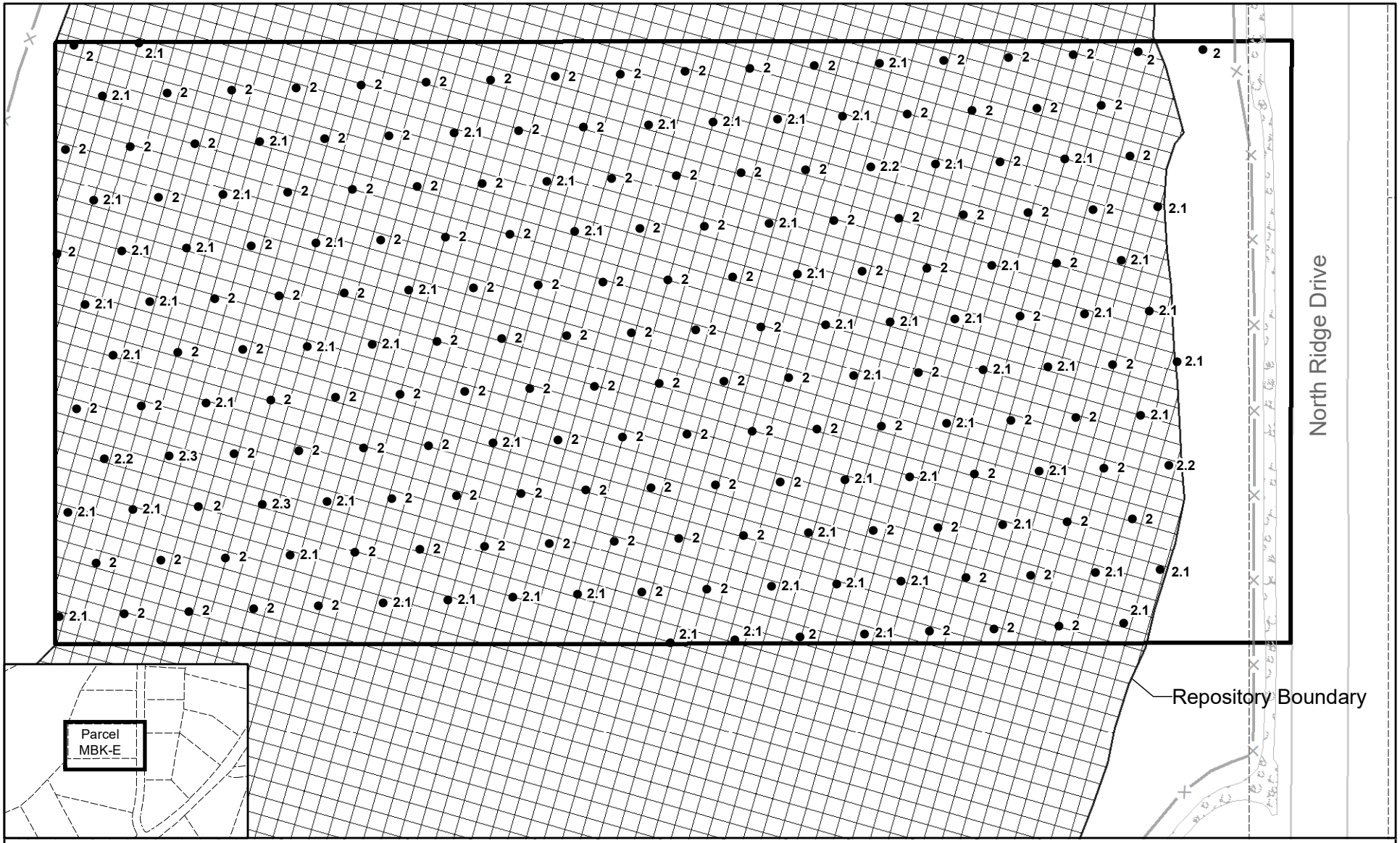
Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Memorial Park Repository
Parcel MBK-D

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_MBKD_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

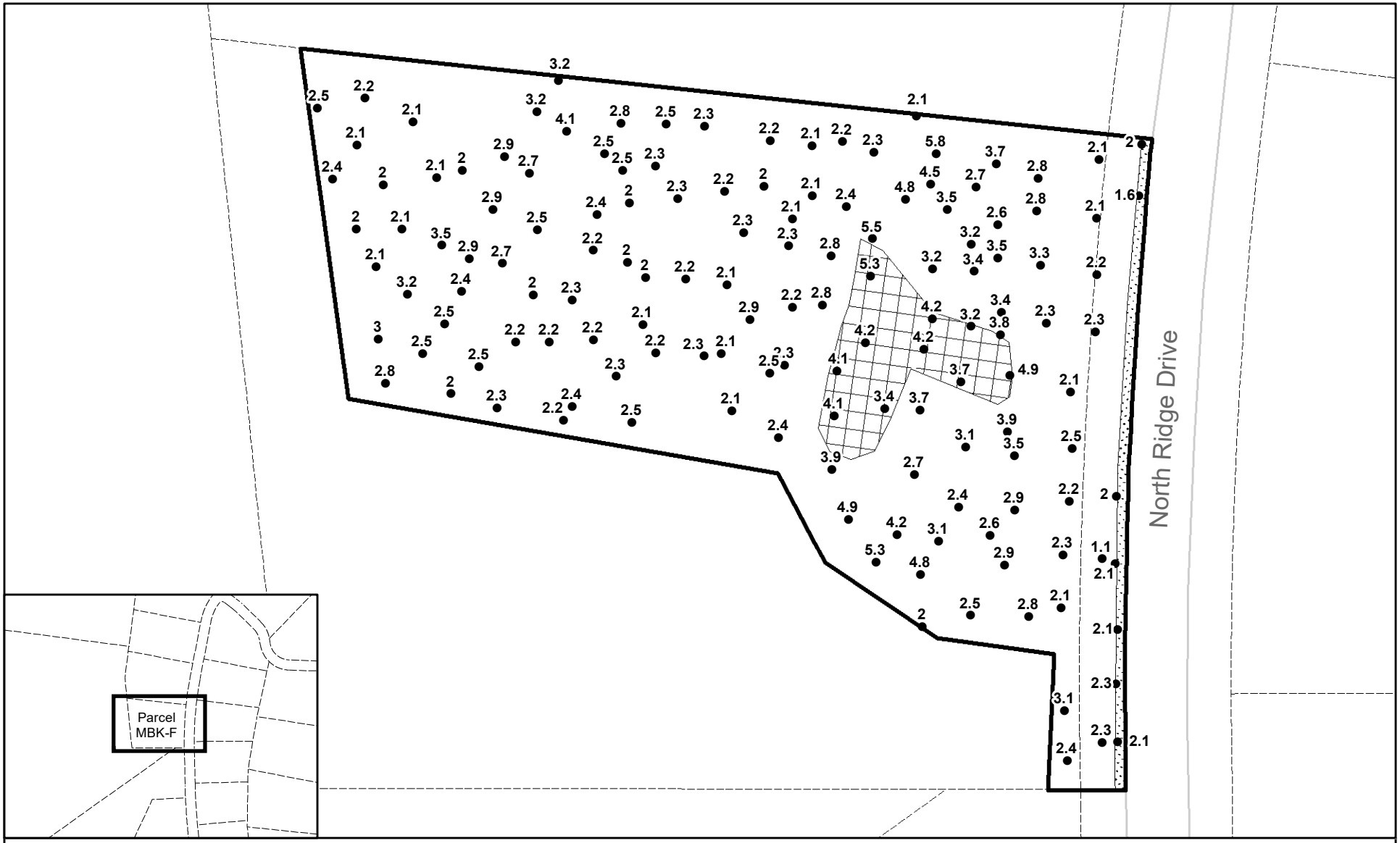
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Swimming Pool Repository
Parcel MBK-E

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_MBKE_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Gravel

Note: Protective liner installed under covered decks and in crawlspaces.

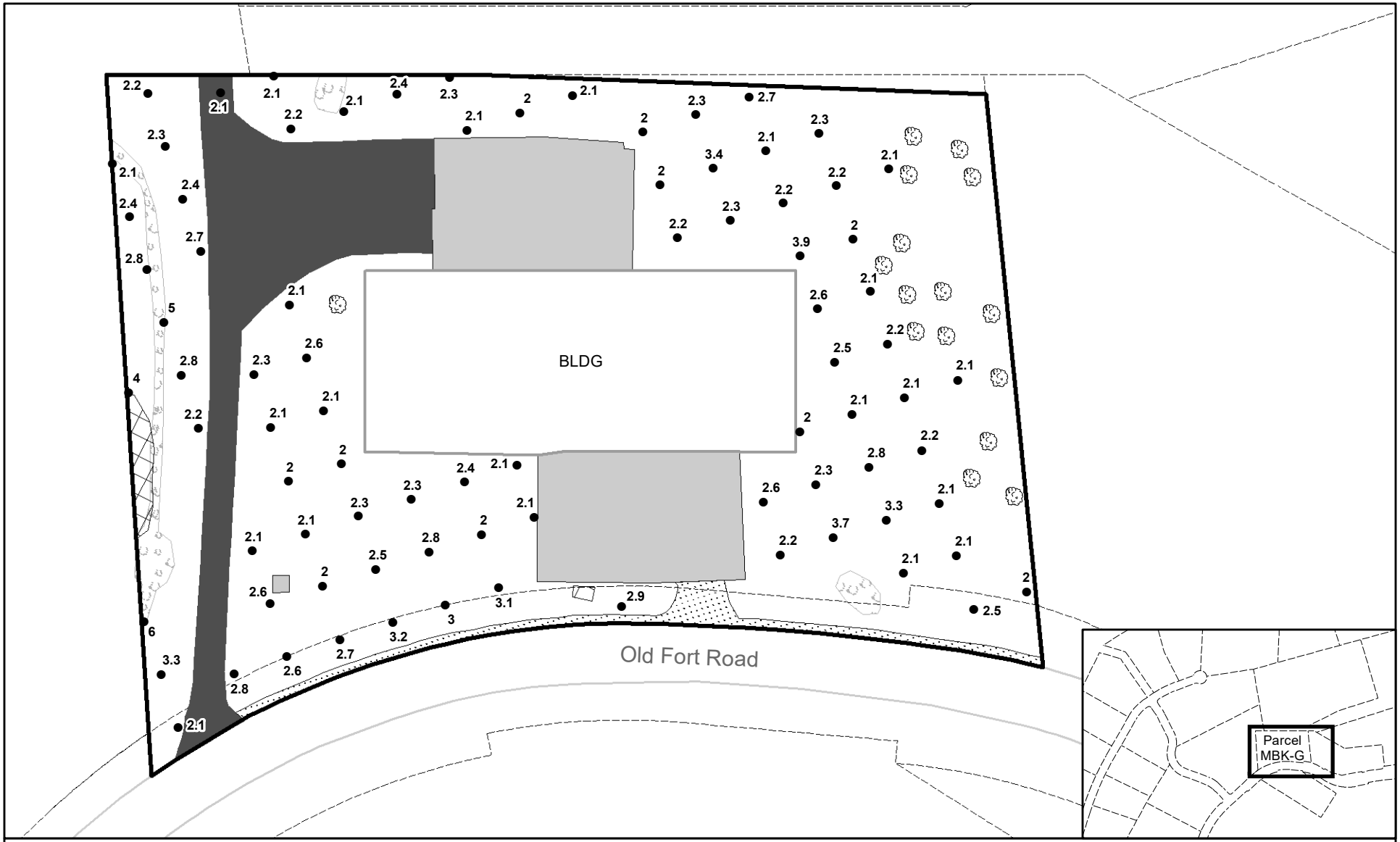
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Parcel MBK-F

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_MBKF_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Asphalt
- Structure
- Gravel
- Oversized Material

Existing concrete ramp structures and building floor slab were in place prior to demolition activities. No ACM is suspected to be present beneath these features.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

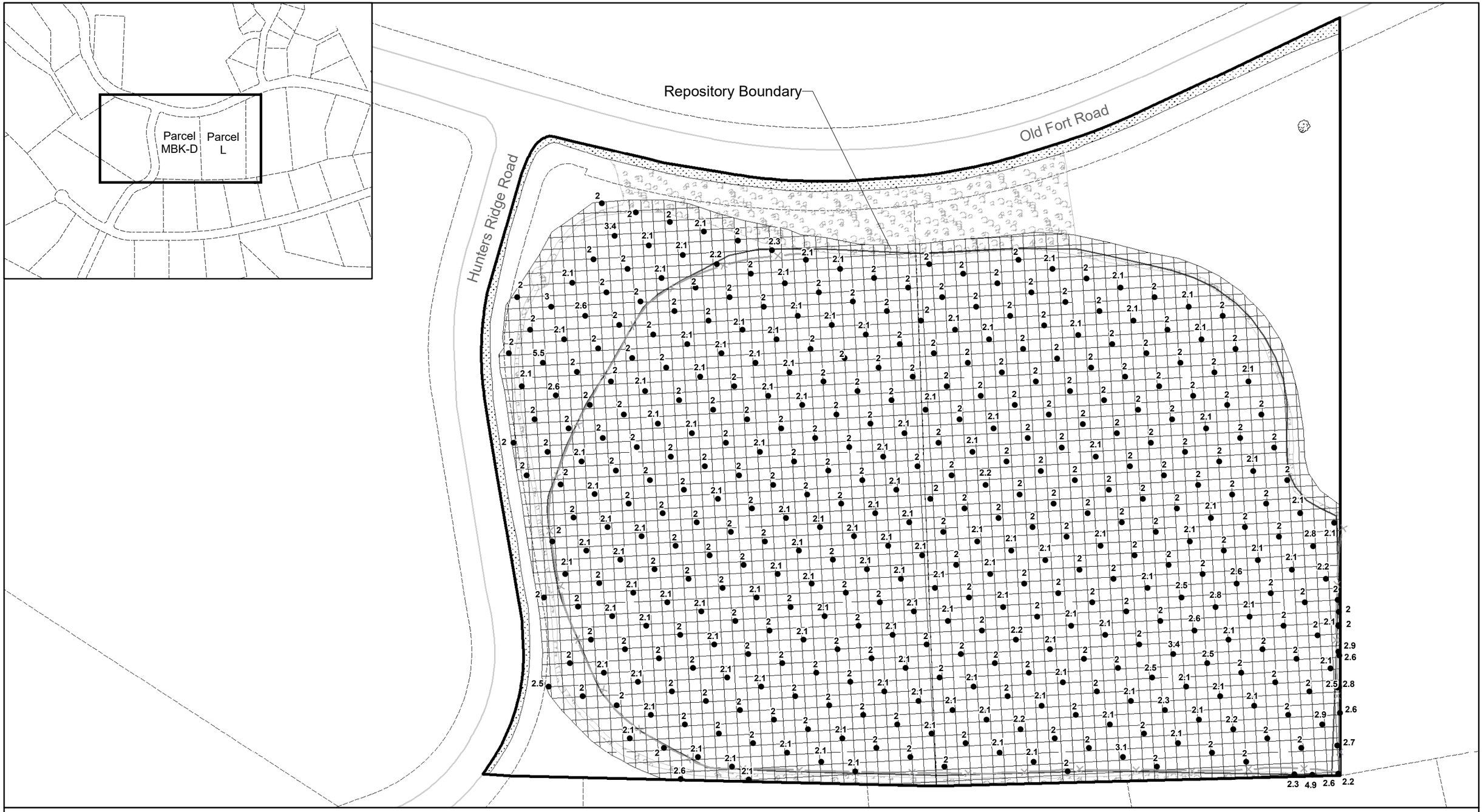
N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3500 Old Fort Road
Parcel MBK-G

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_MBKG_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Gravel
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

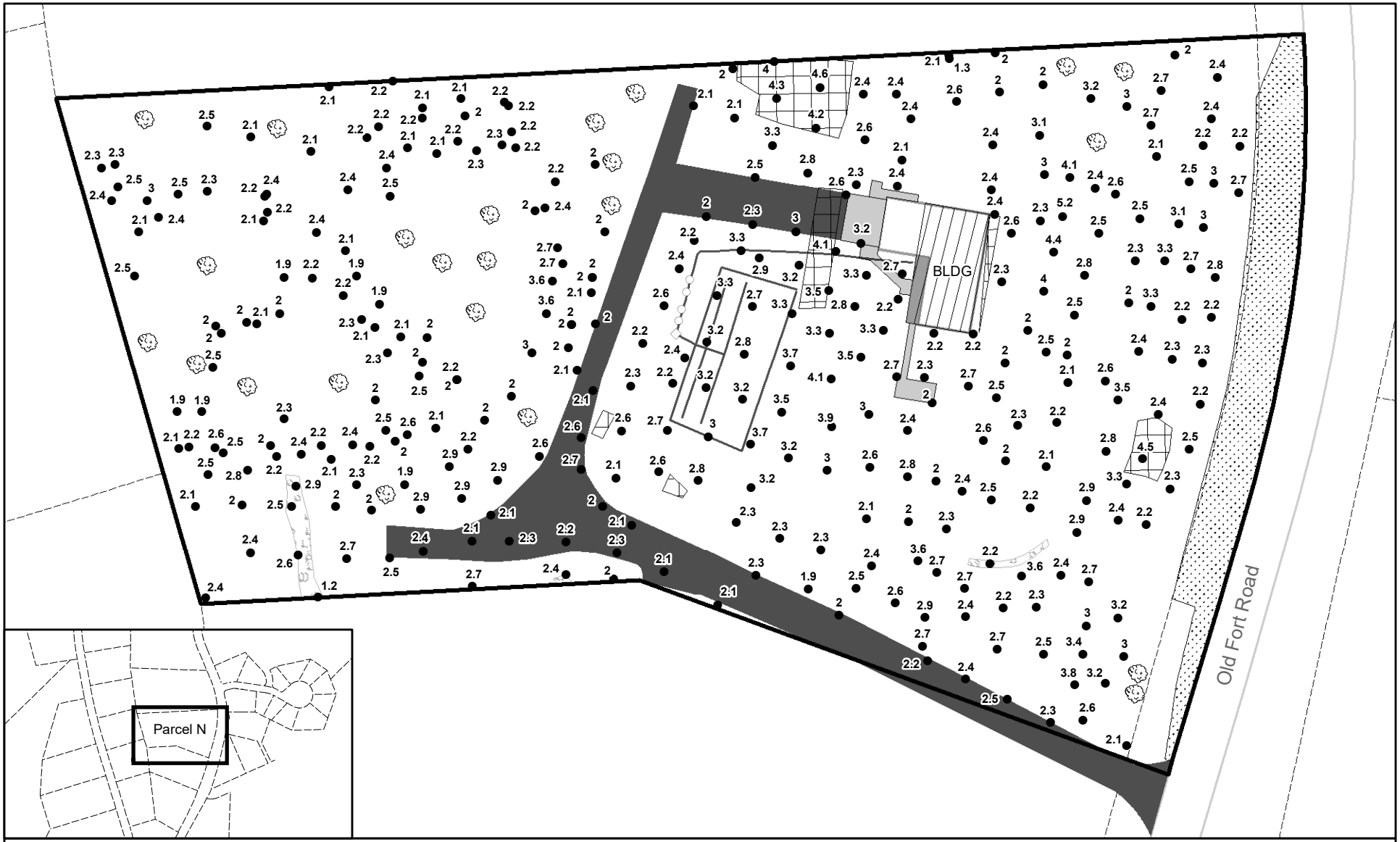
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 50 100
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Memorial Park Repository

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_MemPark.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

Existing concrete driveway apron and garage floor slab were left in place. ACM may be present beneath this protective cap.

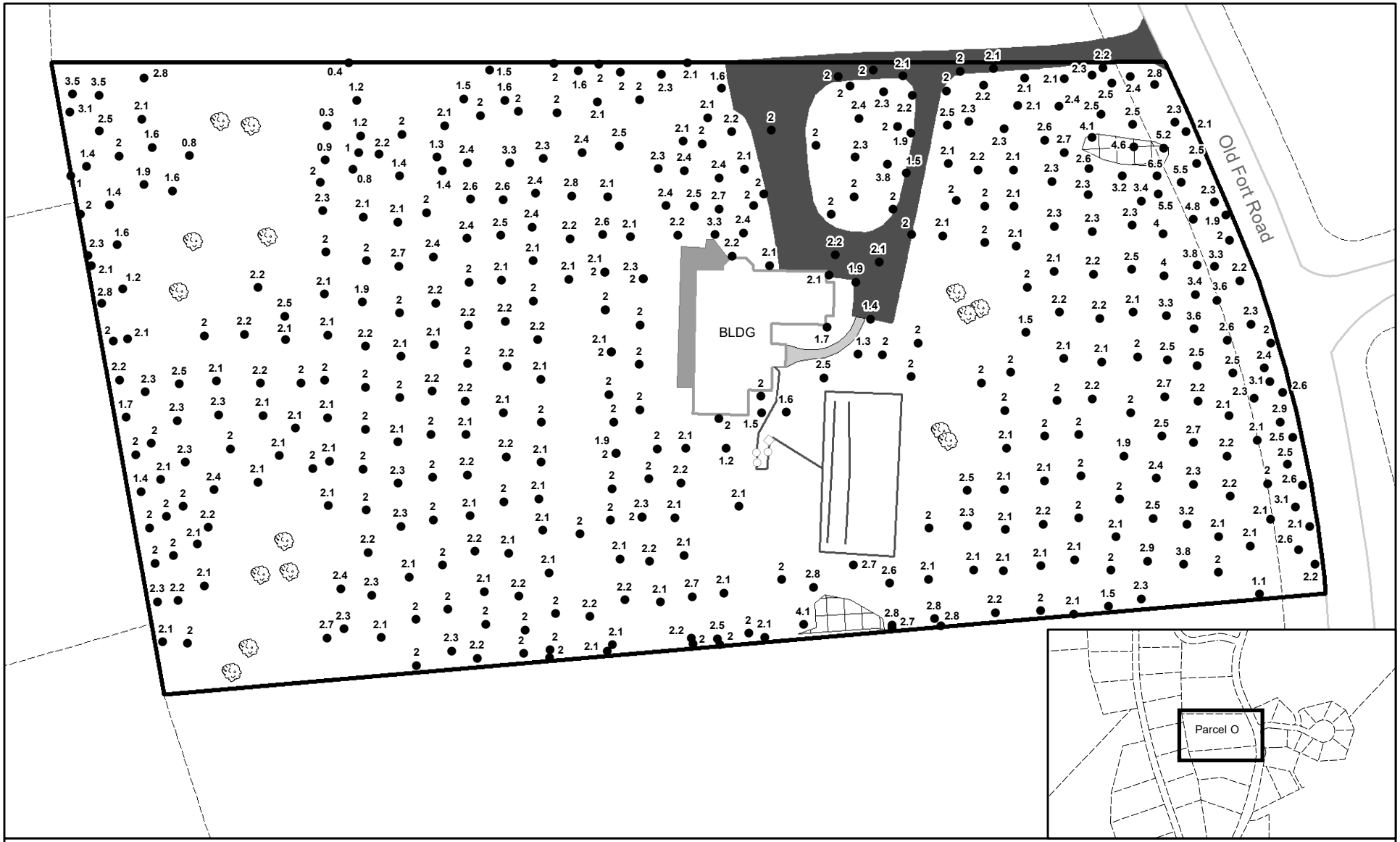
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3668 Old Fort Road
Parcel N

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_N_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure

Note: Protective liner installed under covered decks and in crawlspaces.

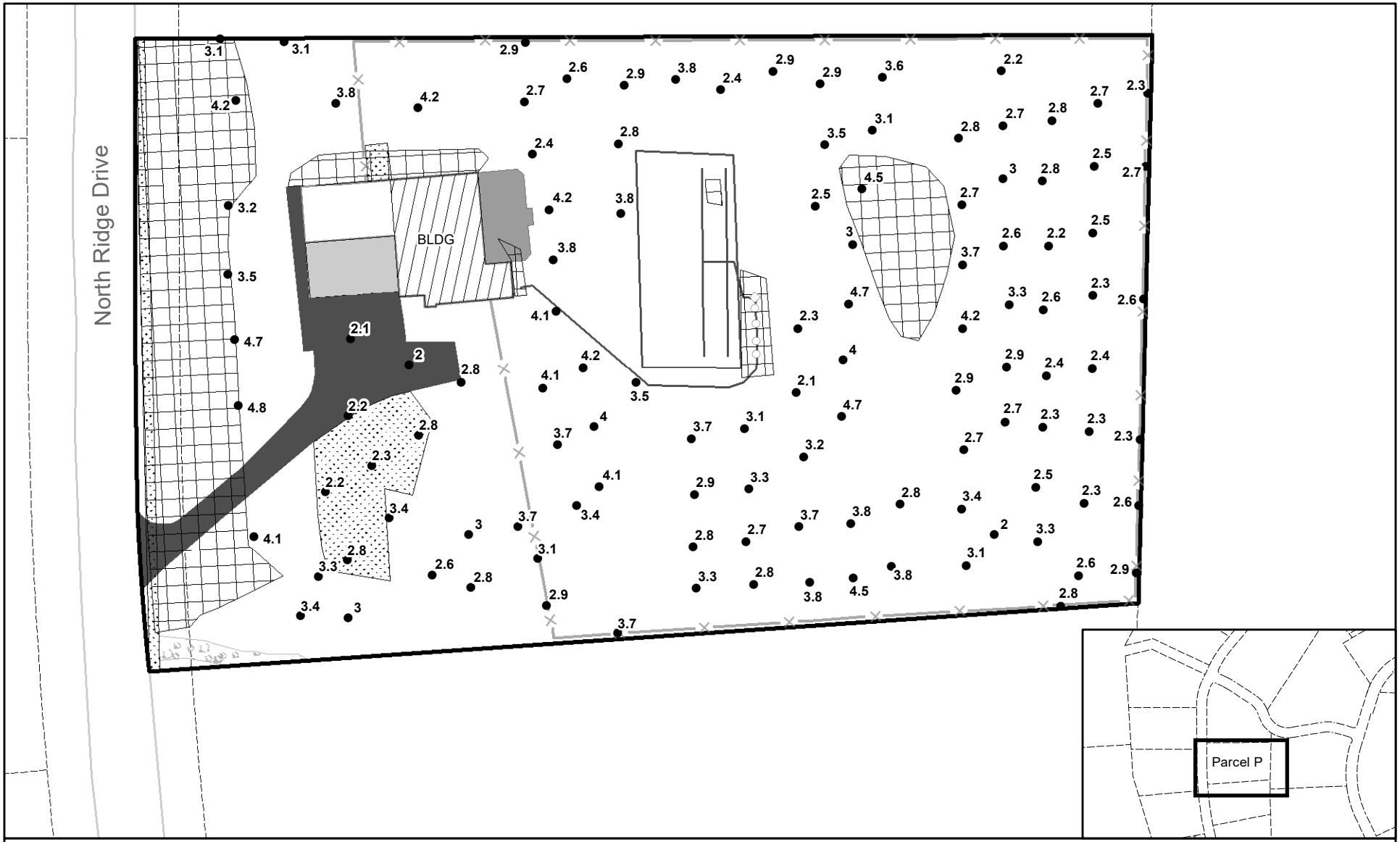
Existing concrete basement slab in house and garage floor slab were left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3808 Old Fort Road
Parcel O

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_O_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

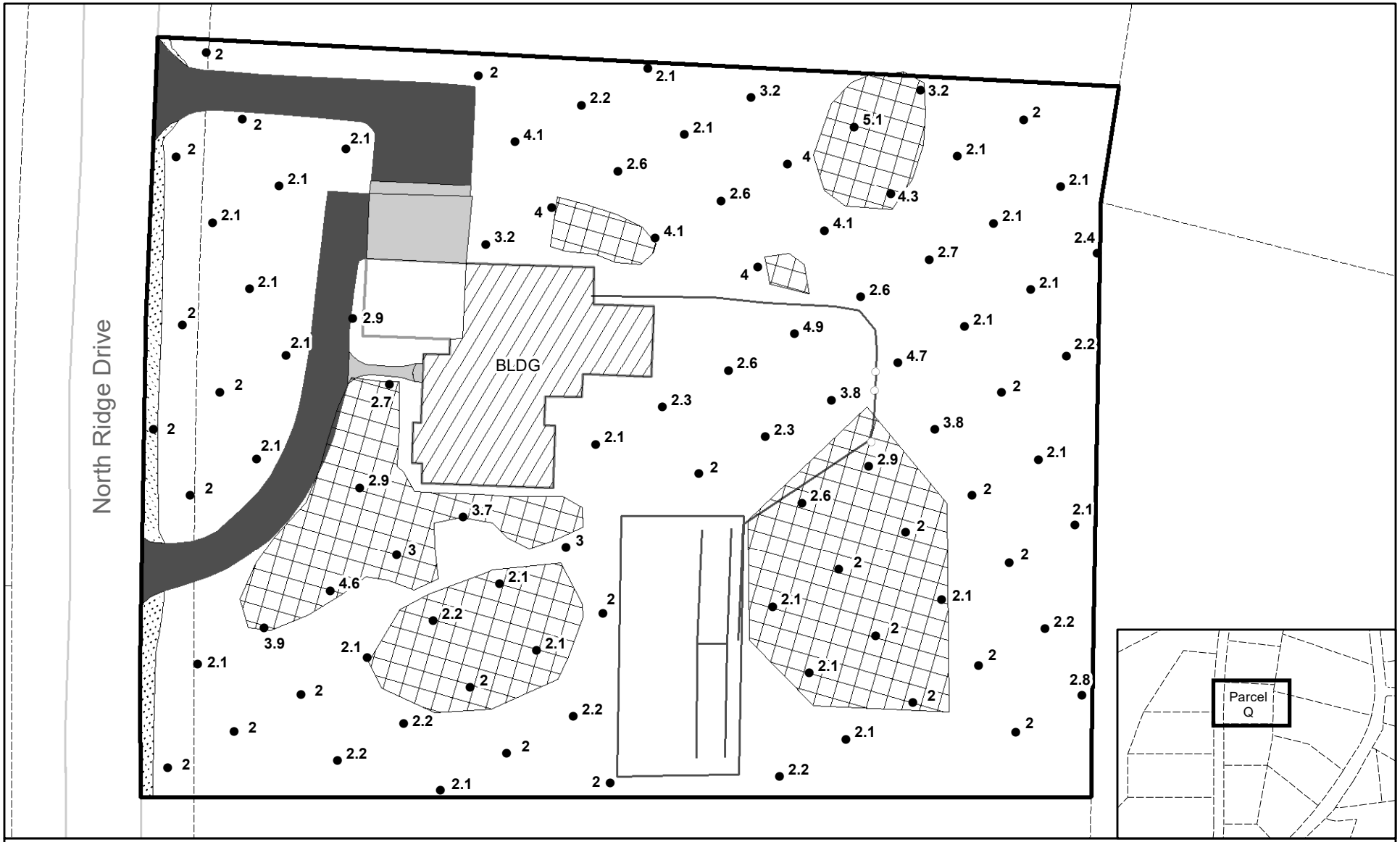
Existing concrete driveway apron and garage floor slab were left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3515 North Ridge Drive
Parcel P

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_P_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Asphalt
- Structure
- Gravel
- Liner

Existing concrete driveway apron and garage floor slab were left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

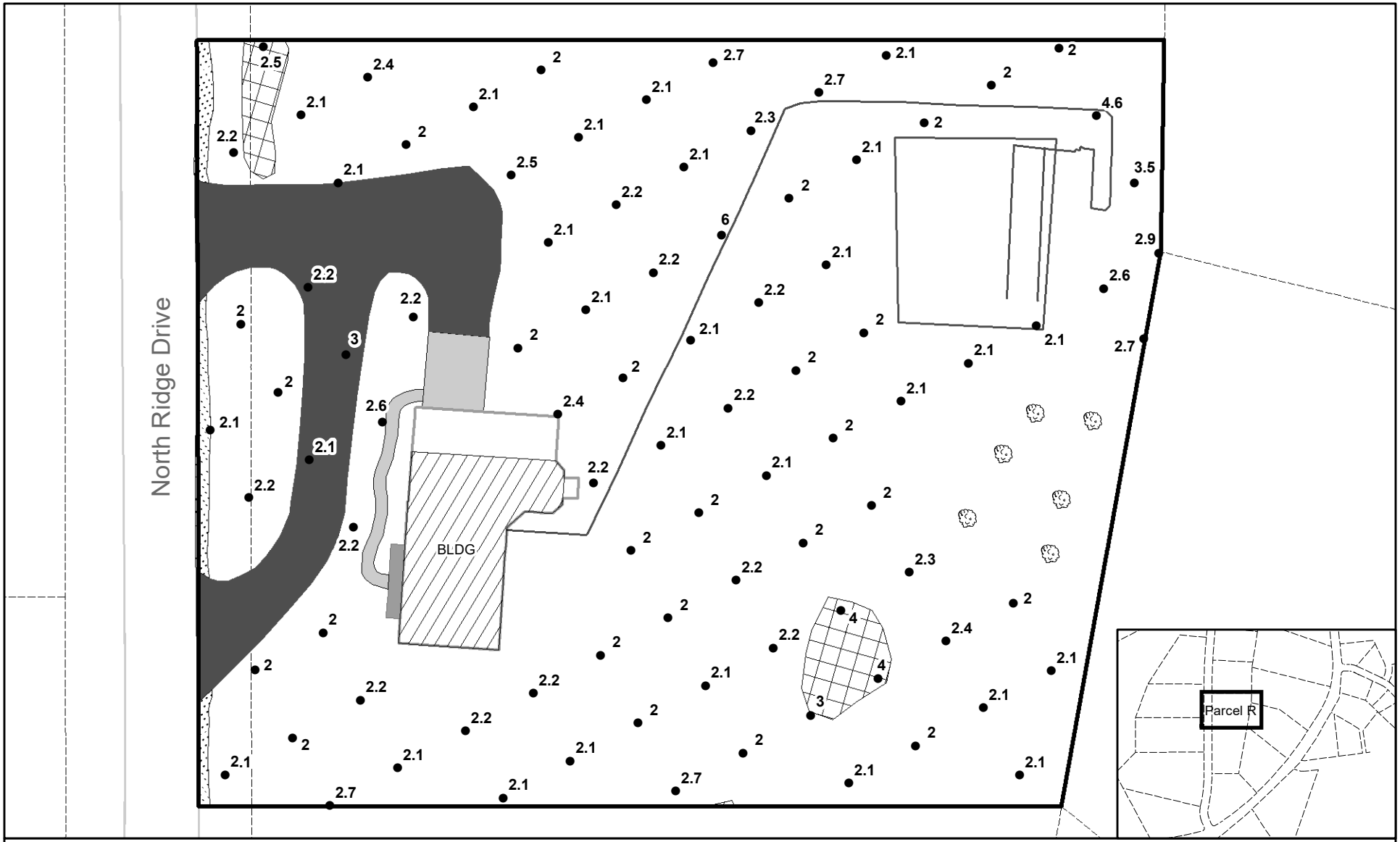
N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3533 North Ridge Drive
Parcel Q

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_Q_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner

Existing concrete driveway apron and garage floor slab were left in place. ACM may be present beneath this protective cap.

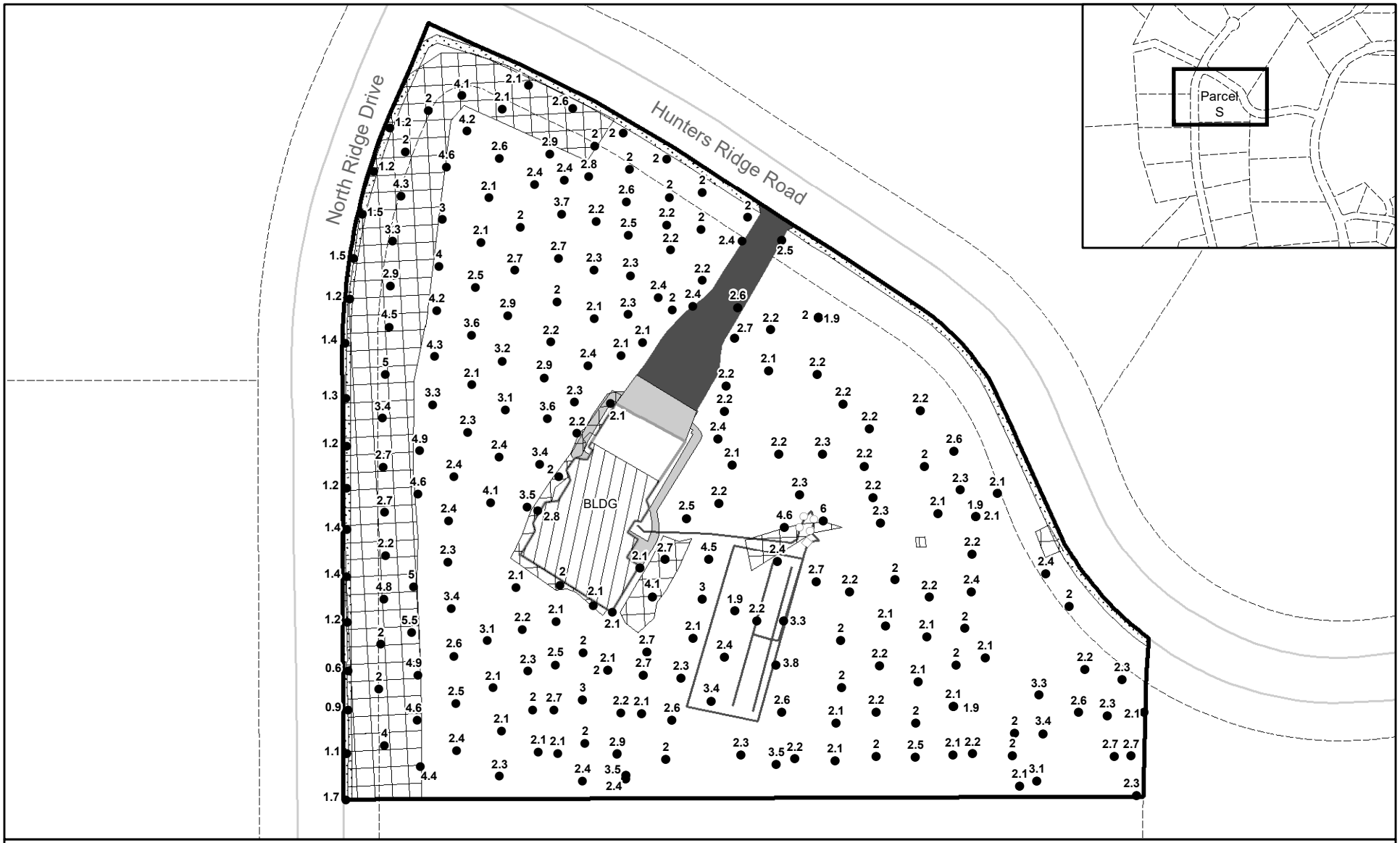
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3537 North Ridge Drive
Parcel R

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_R_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Asphalt
- Structure
- Gravel
- Liner

Note: Protective liner installed under covered decks and in crawlspaces.

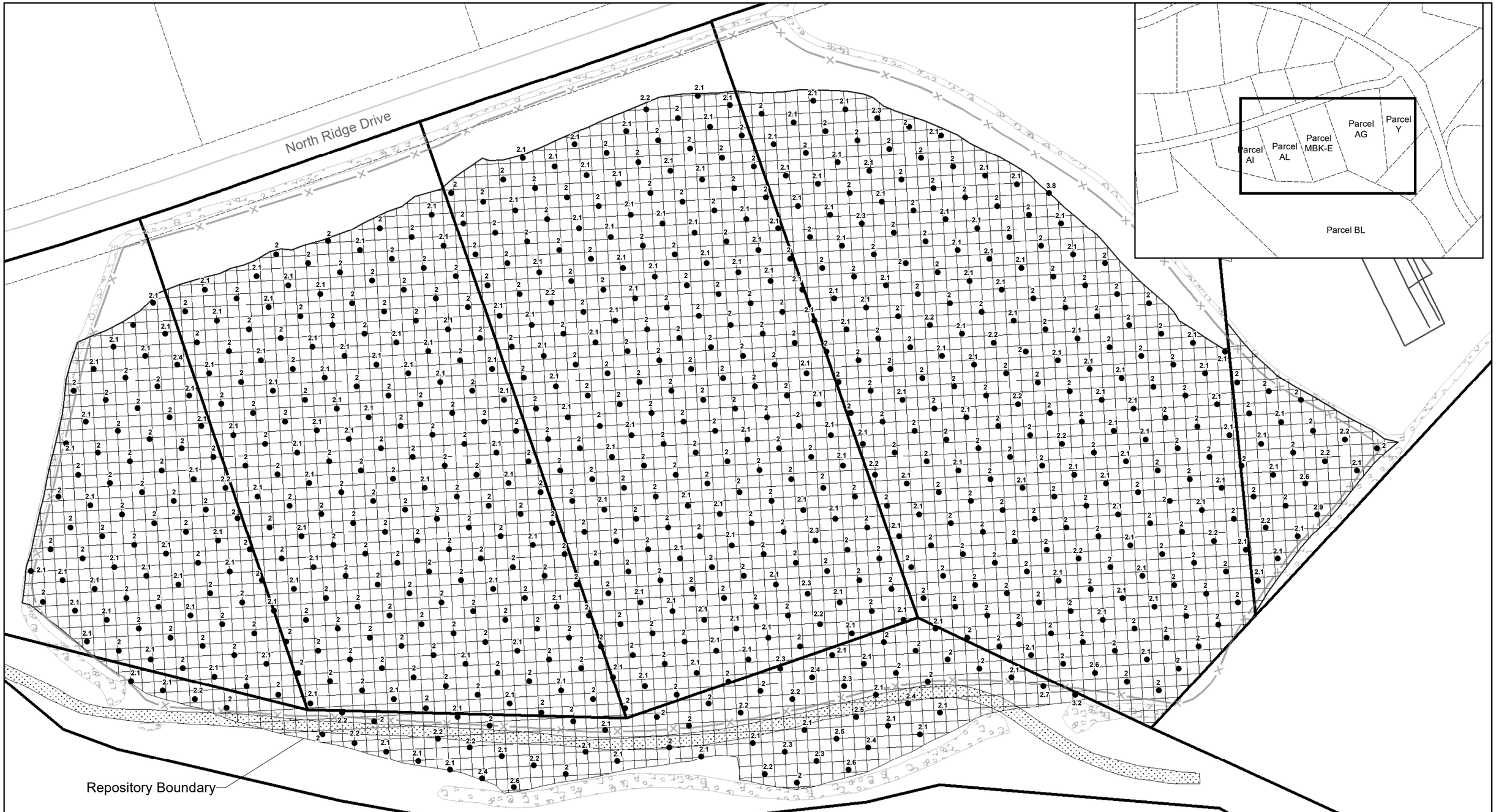
Existing concrete driveway apron and garage floor slab were left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3530 Hunters Ridge Road
Parcel S

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_S_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Deck
- Structure
- Gravel
- Liner
- Oversized Material

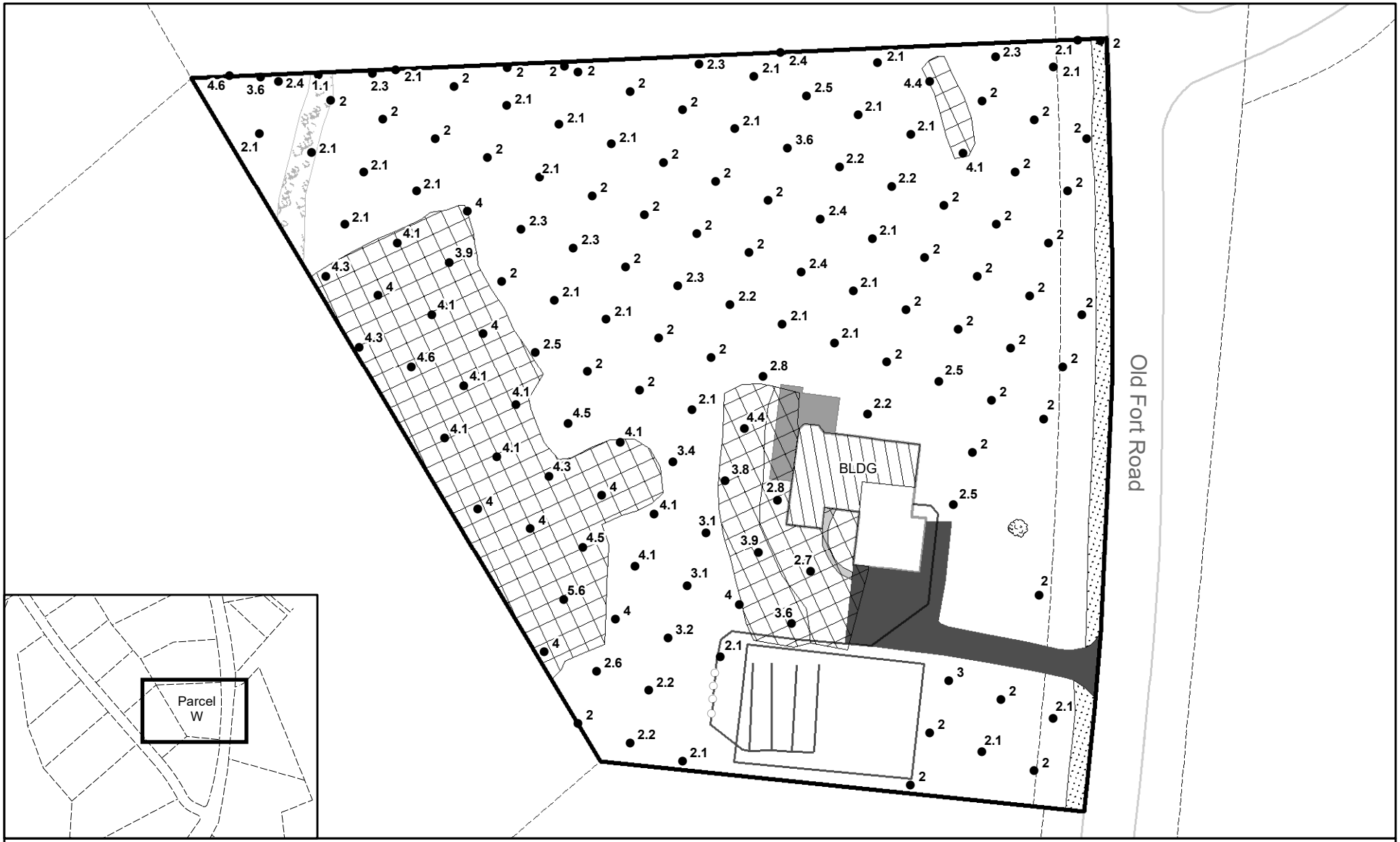
Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 50 100
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Swimming Pool Repository

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_QC_grid_SPR.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

Existing concrete driveway apron and garage floor slab were left in place. ACM may be present beneath this protective cap.

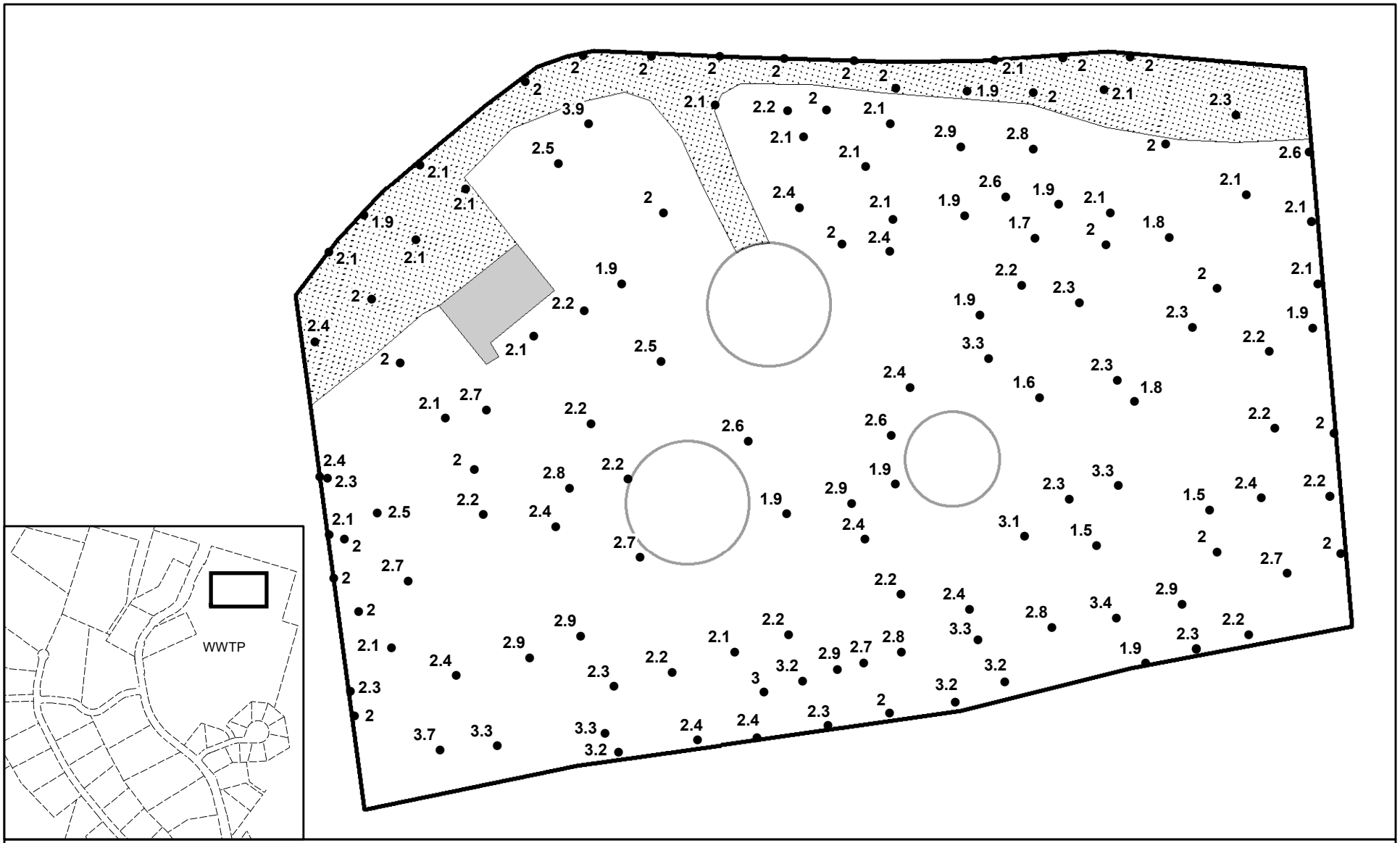
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3442 Old Fort Road
Parcel W

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_W_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Concrete
- Structure
- Gravel

Existing concrete wastewater treatment-related foundations were in place prior to demolition activities. No ACM is suspected to be present beneath these features.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

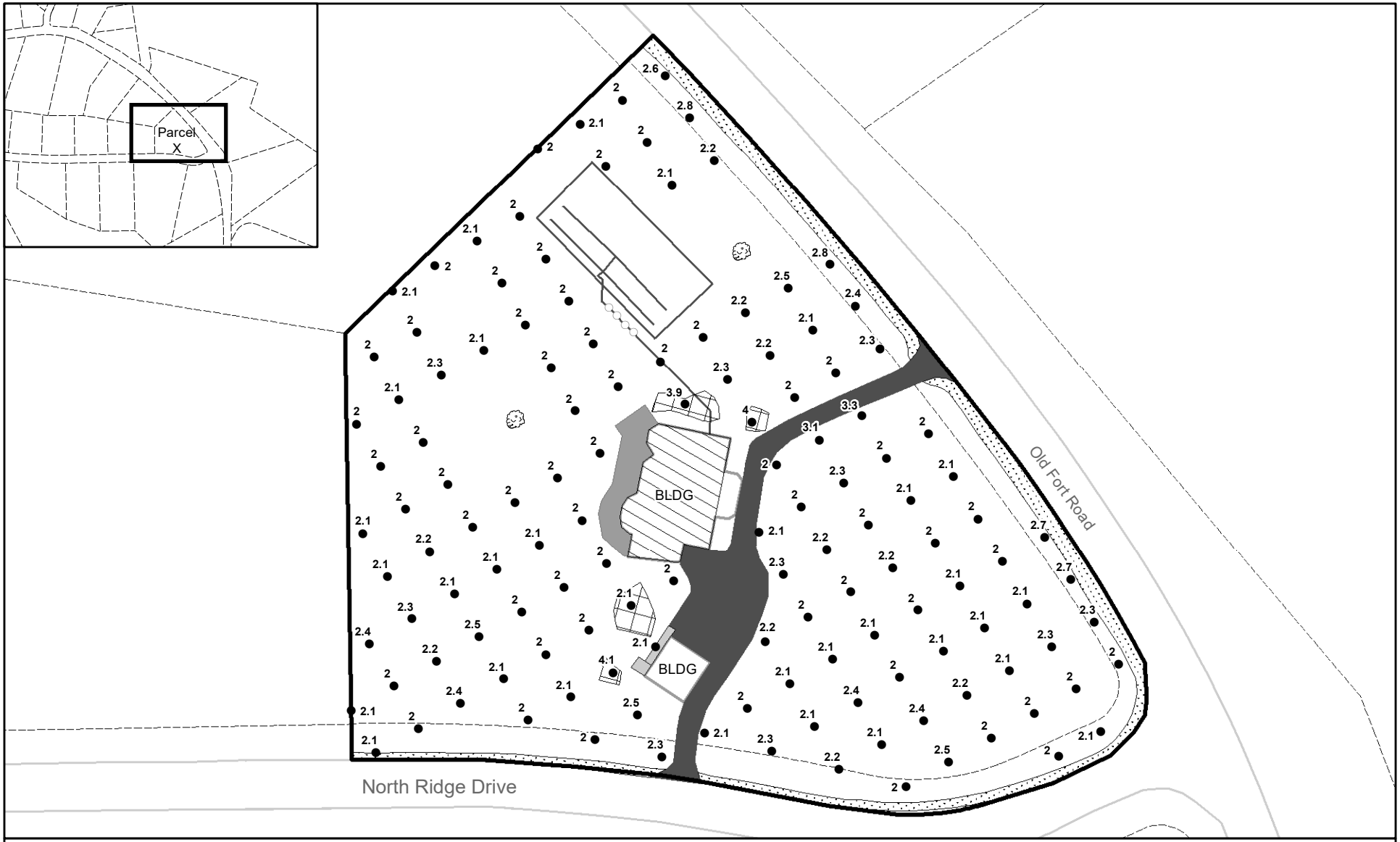
N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
WWTP

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_WWTP_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner

Note: Protective liner installed under covered decks and in crawlspaces.

Existing concrete entryway and garage floor slab were left in place. ACM may be present beneath this protective cap.

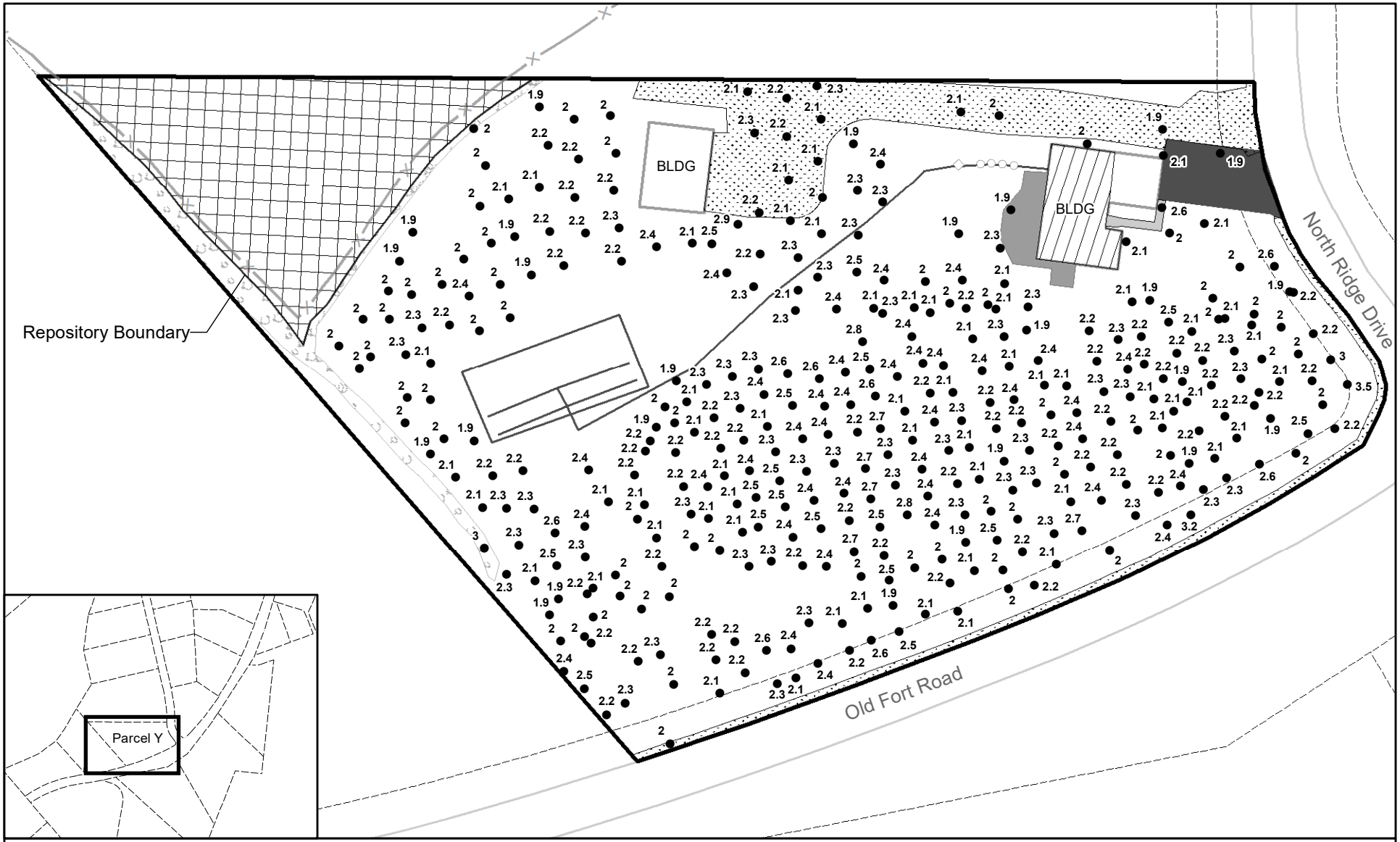
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3601 North Ridge Drive
Parcel X

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_X_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Note: Protective liner installed under covered decks and in crawlspaces.

Existing concrete garage floor slabs were left in place. ACM may be present beneath this protective cap.

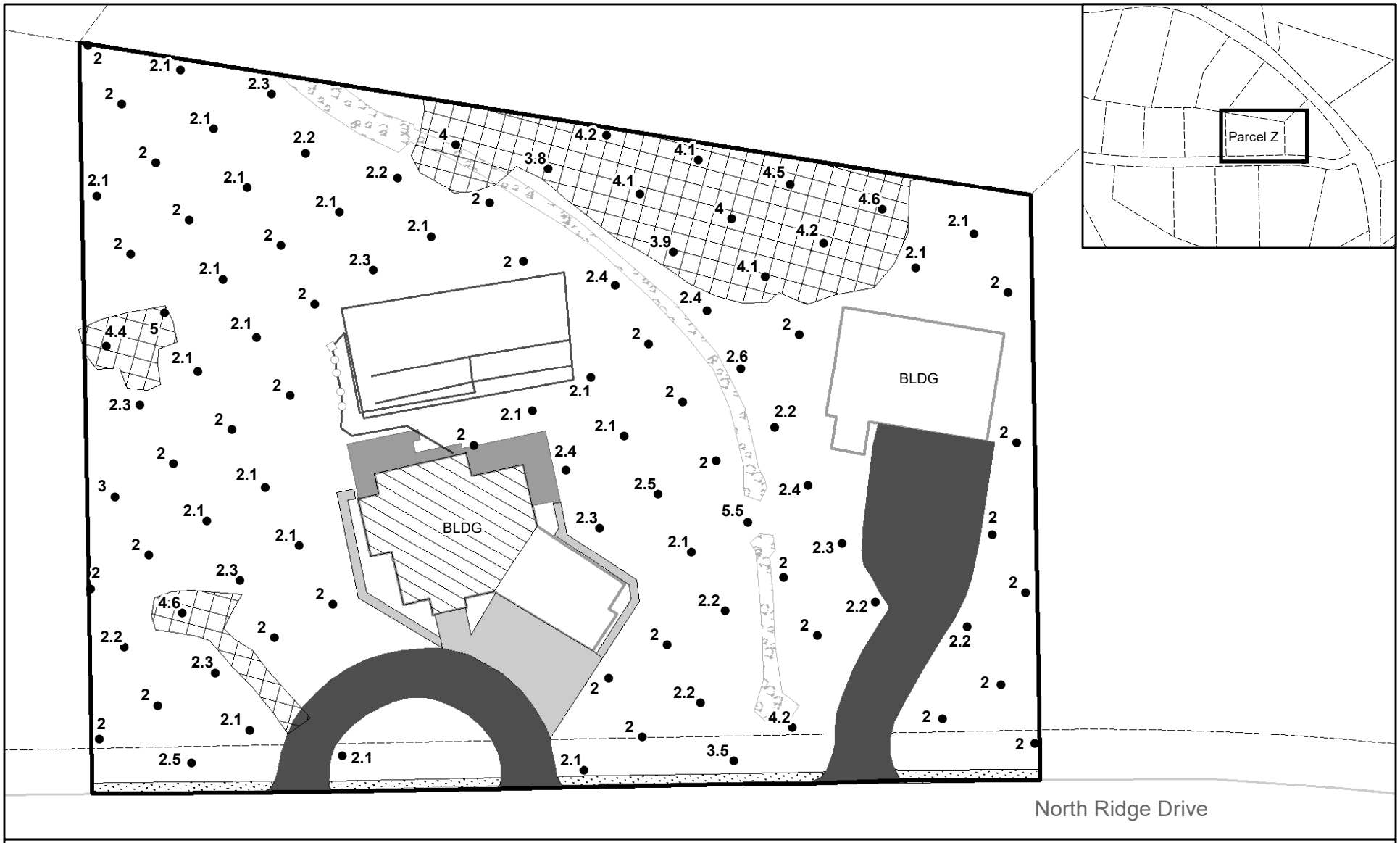
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3636 North Ridge Drive
Parcel Y

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_Y_inset.mxd



Legend

- Depth of Cap (Ft)
- Tree
- Parcel Boundary
- Excavation Boundary
- Marker Barrier
- Concrete
- Deck
- Asphalt
- Structure
- Gravel
- Liner
- Oversized Material

Existing concrete driveway apron and garage floor slabs were left in place. ACM may be present beneath this protective cap.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

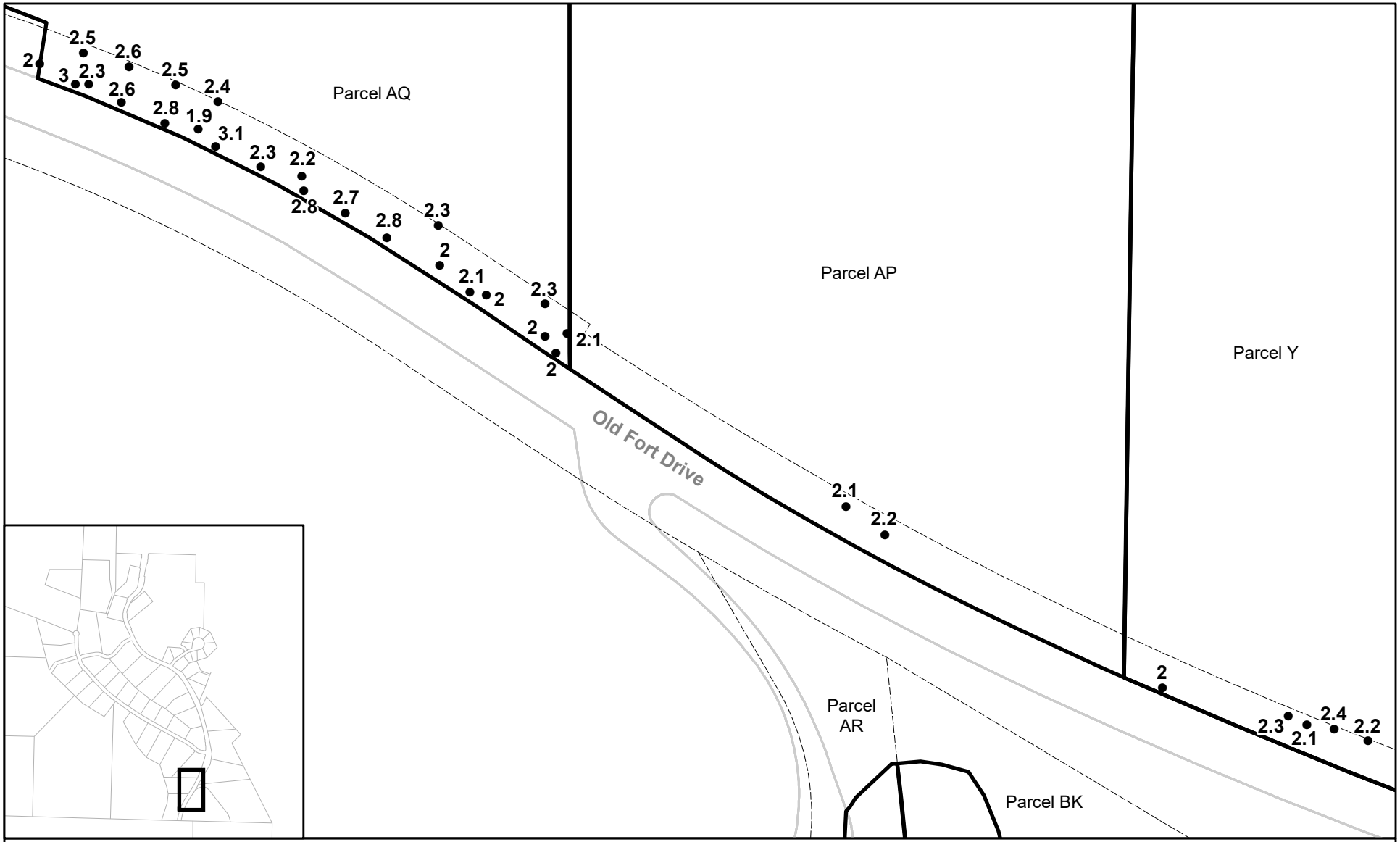
N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
3547 North Ridge Drive
Parcel Z

Note: Protective liner installed under covered decks and in crawlspaces.

Document Path: C:\Northridge\MXD\ParcelMapbooks\CapDepthMap_QC_grid_Z_inset.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

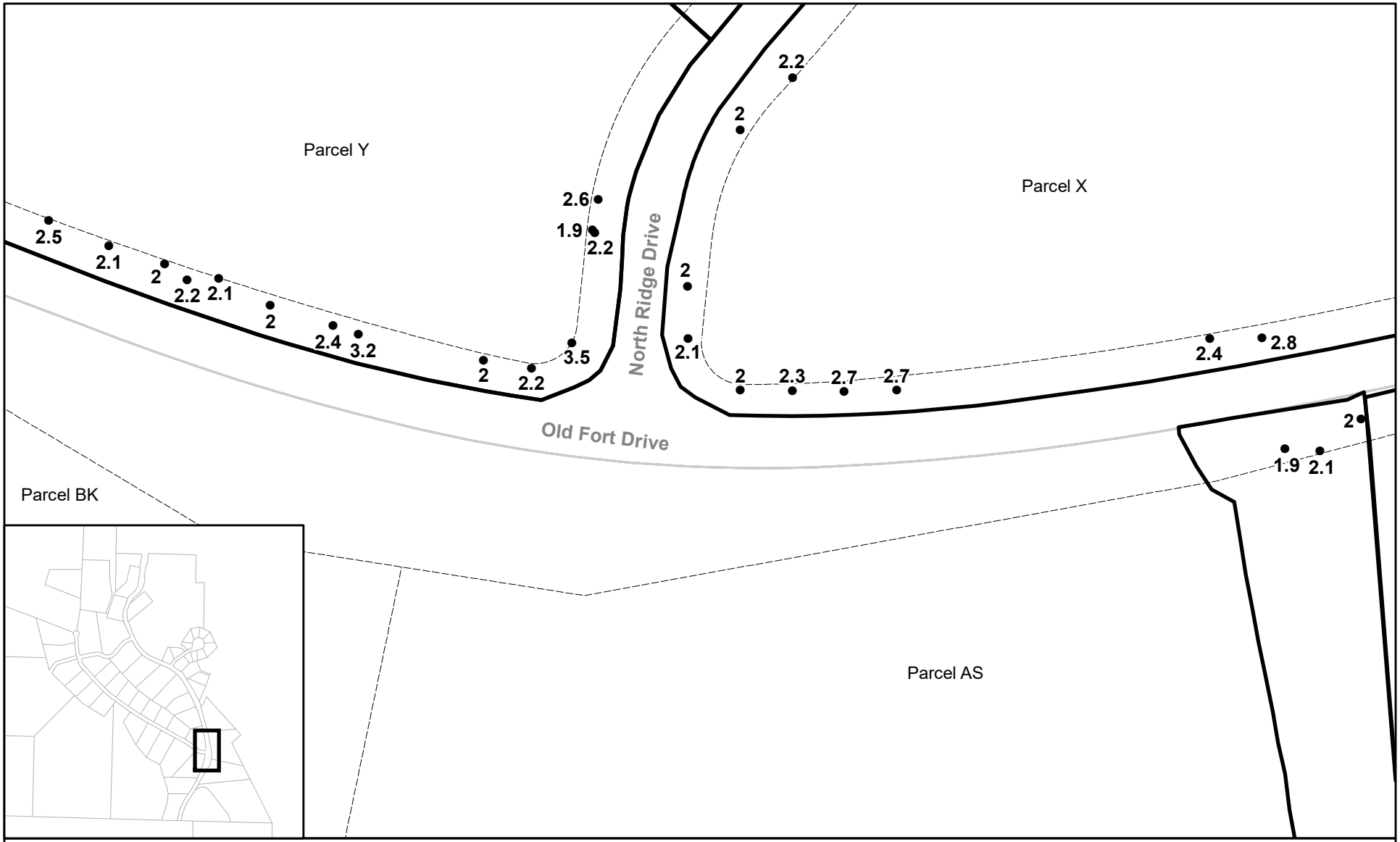
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Old Fort Road
0-750 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

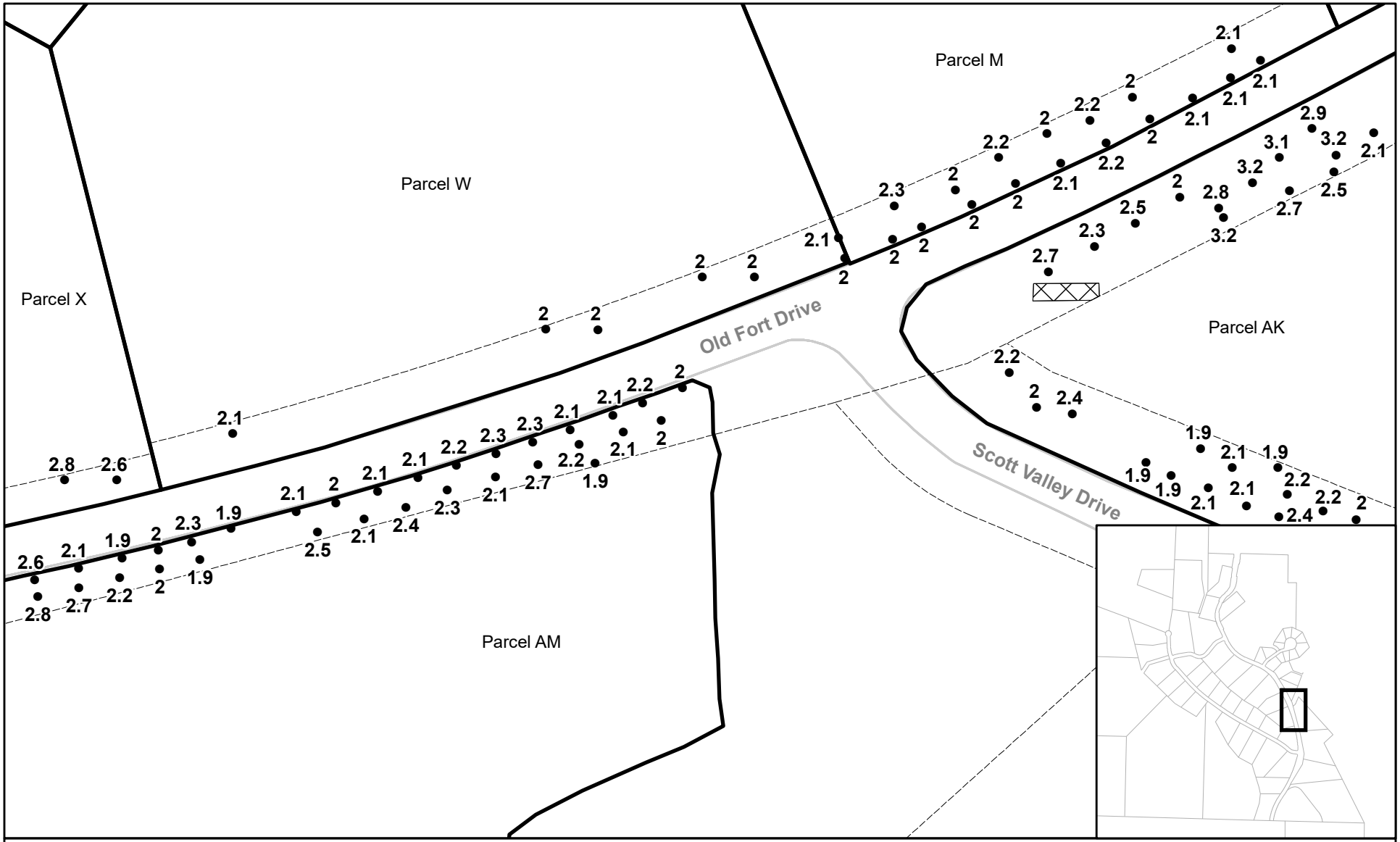
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Old Fort Road
750-1430 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

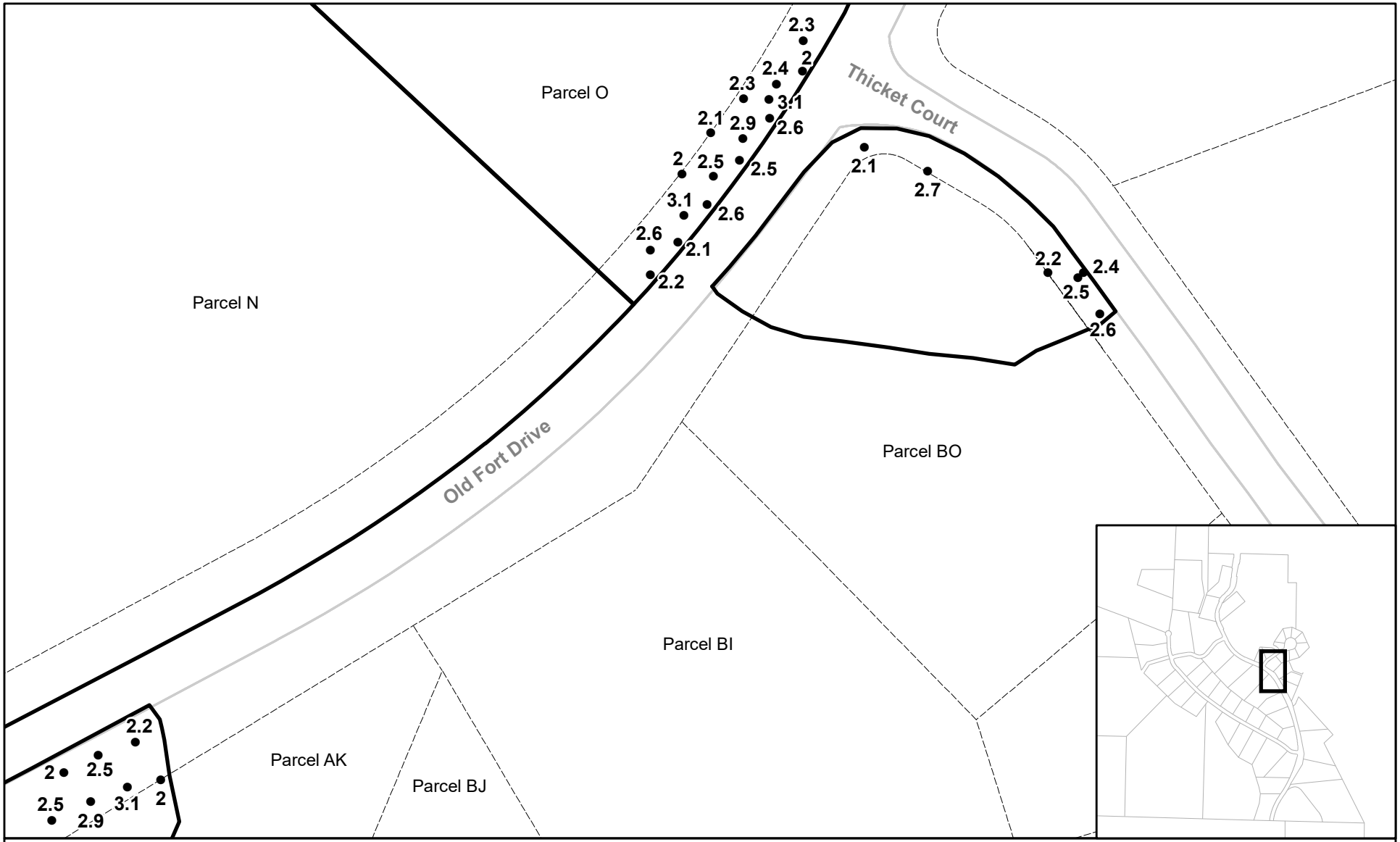
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Old Fort Road
1430-2140 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

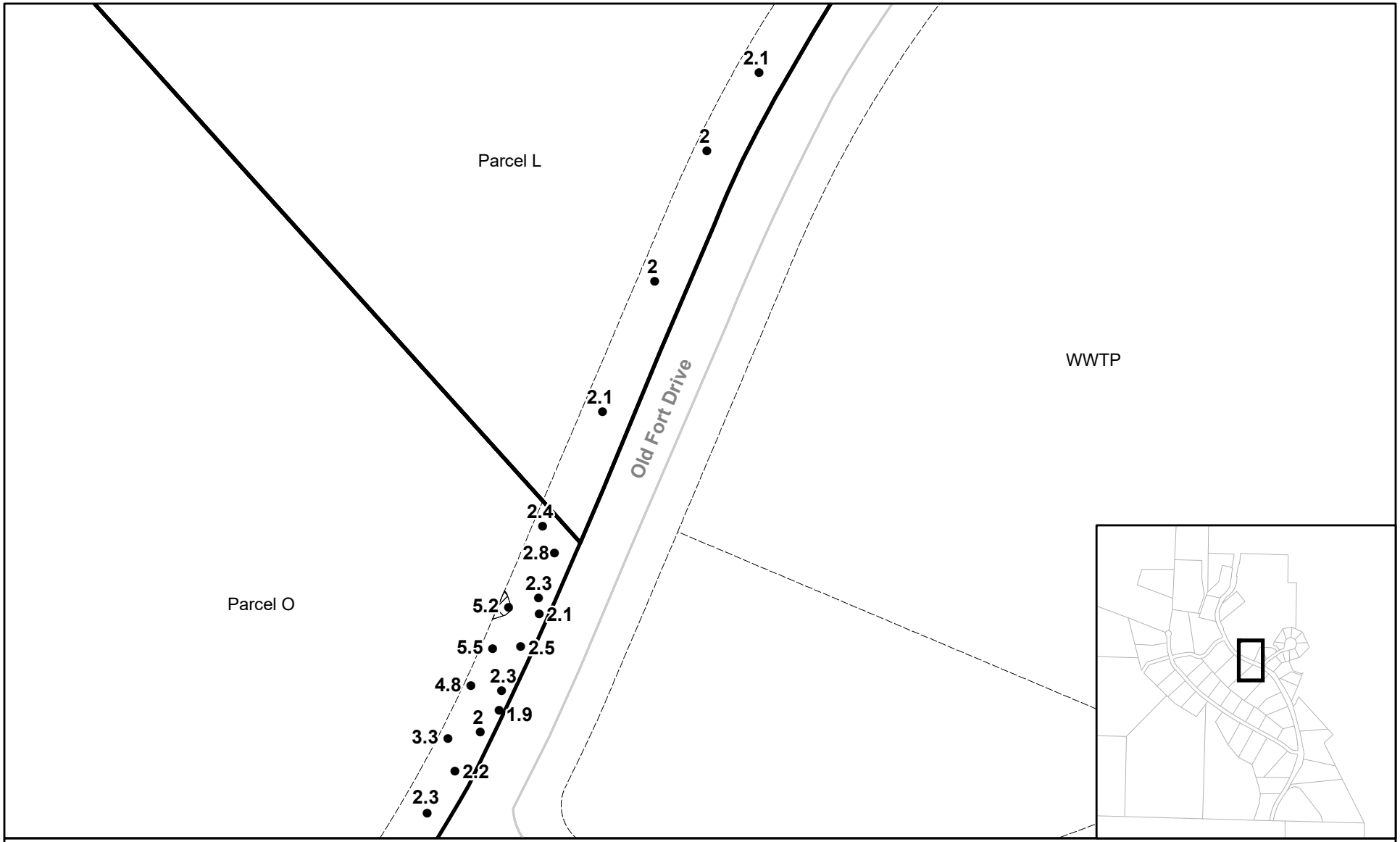
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Old Fort Road
2140-2680 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

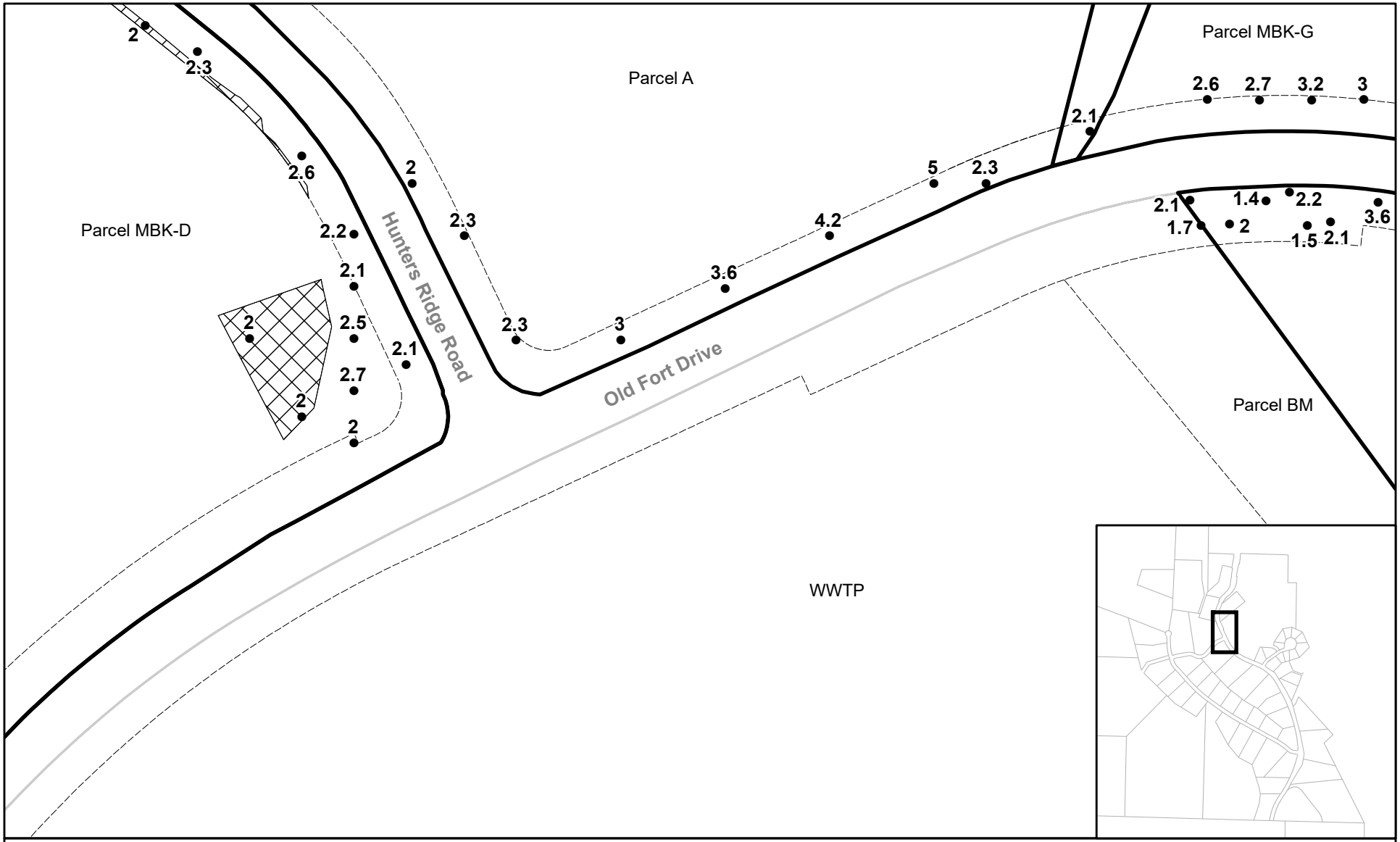
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Old Fort Road
2680-3110 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

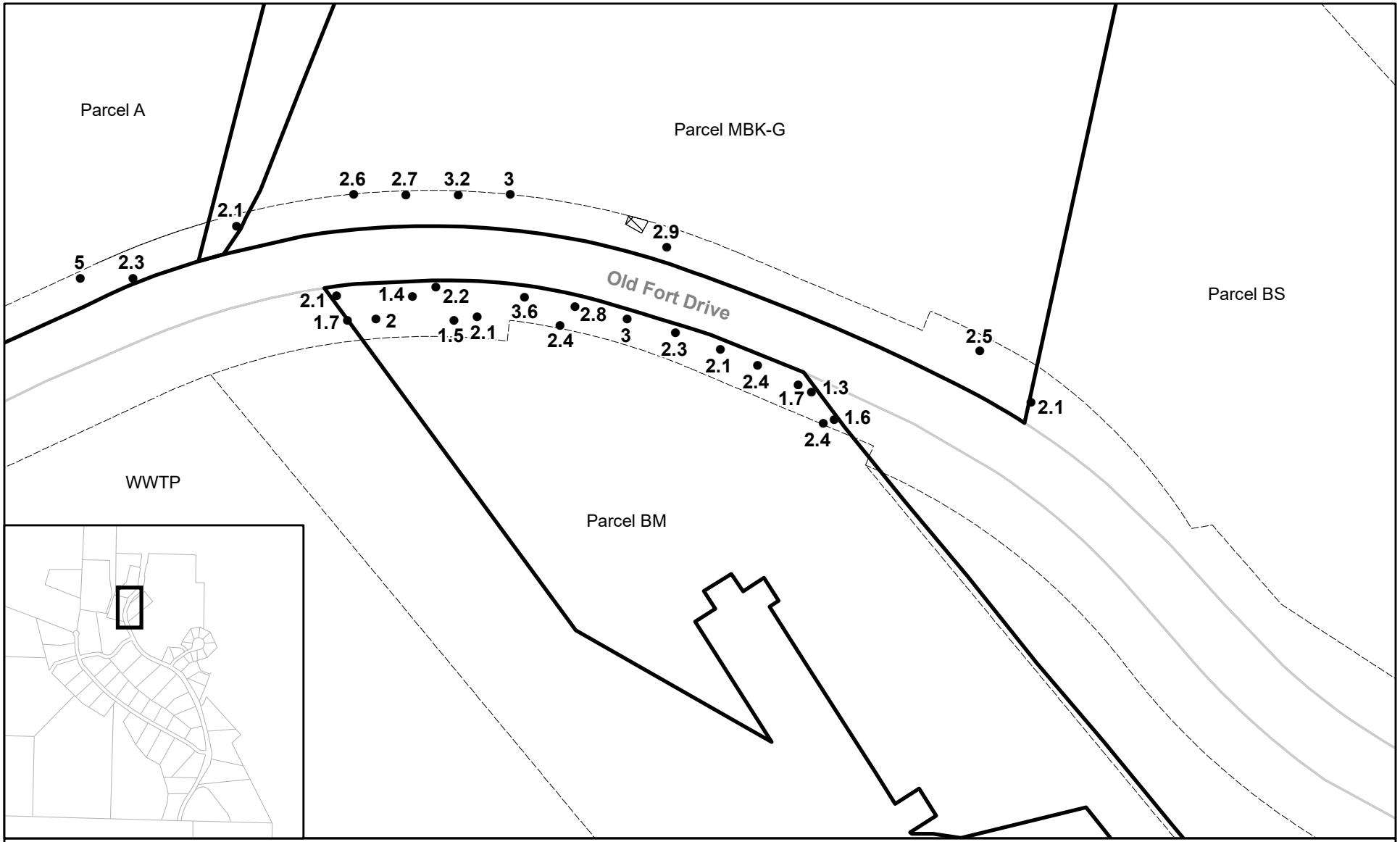
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Old Fort Road
3200-3940 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

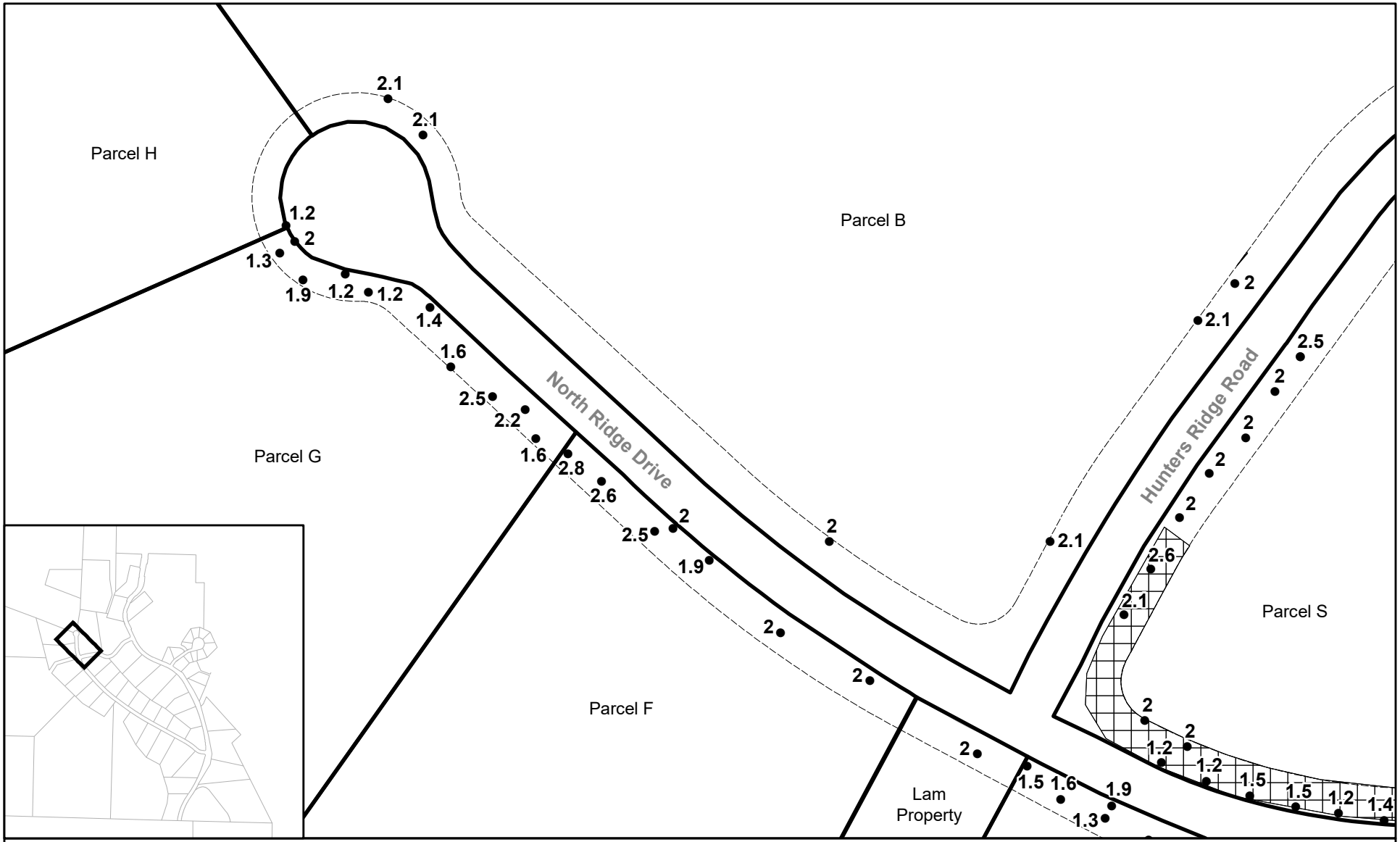
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Old Fort Road
3675-4430 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

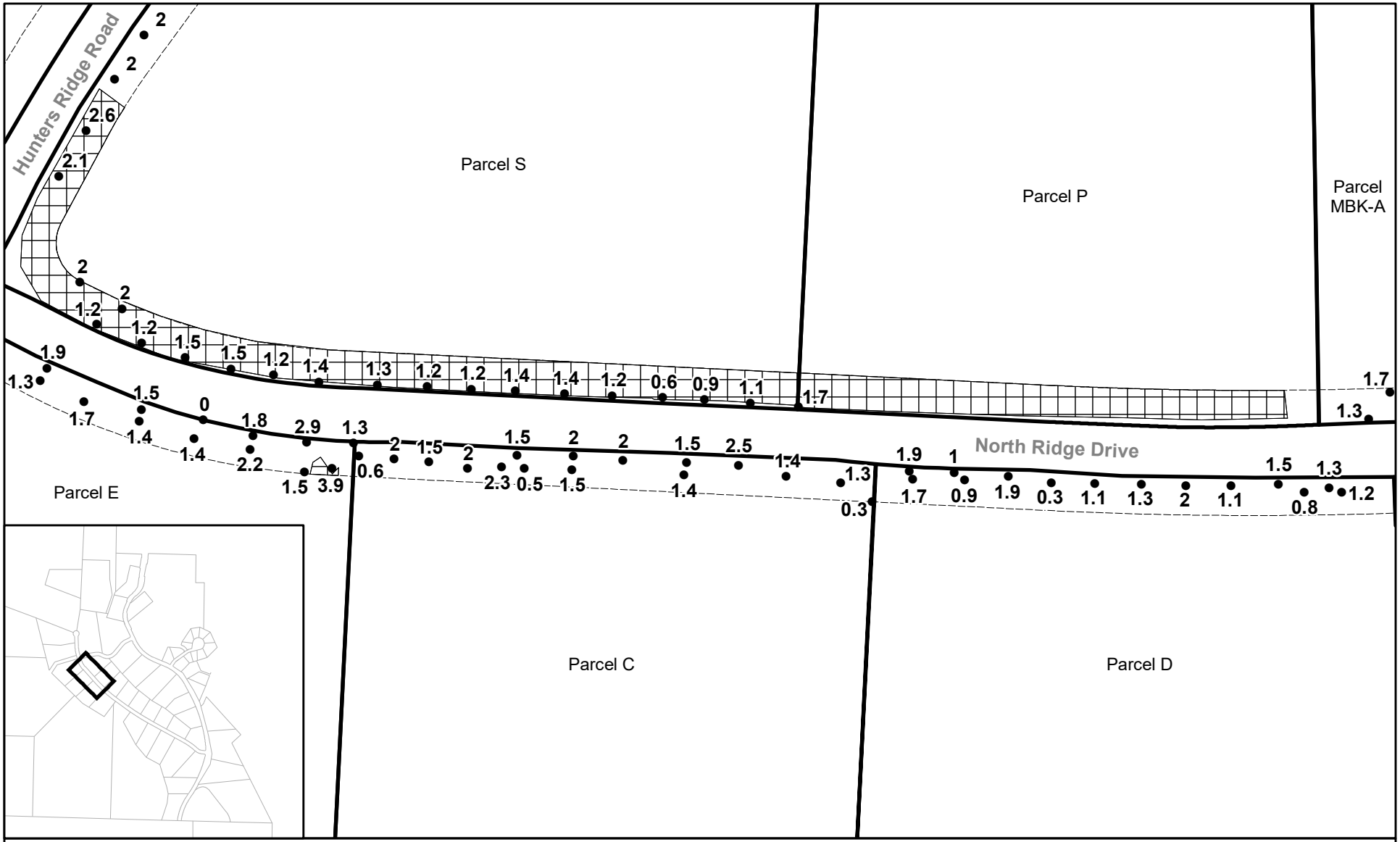
Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
North Ridge Drive
0-550 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

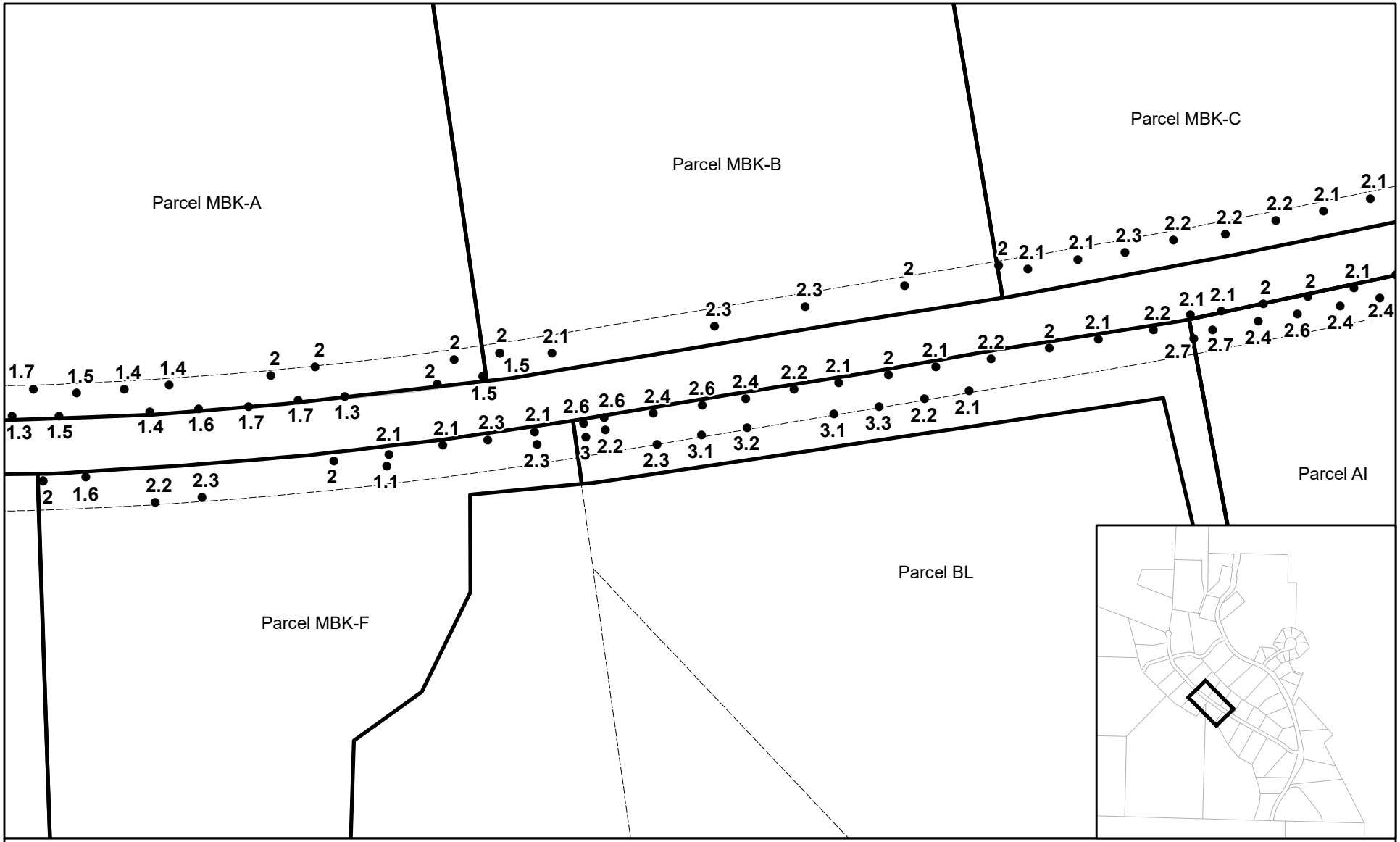
Note: Protective liner installed under covered decks and in crawlspaces.

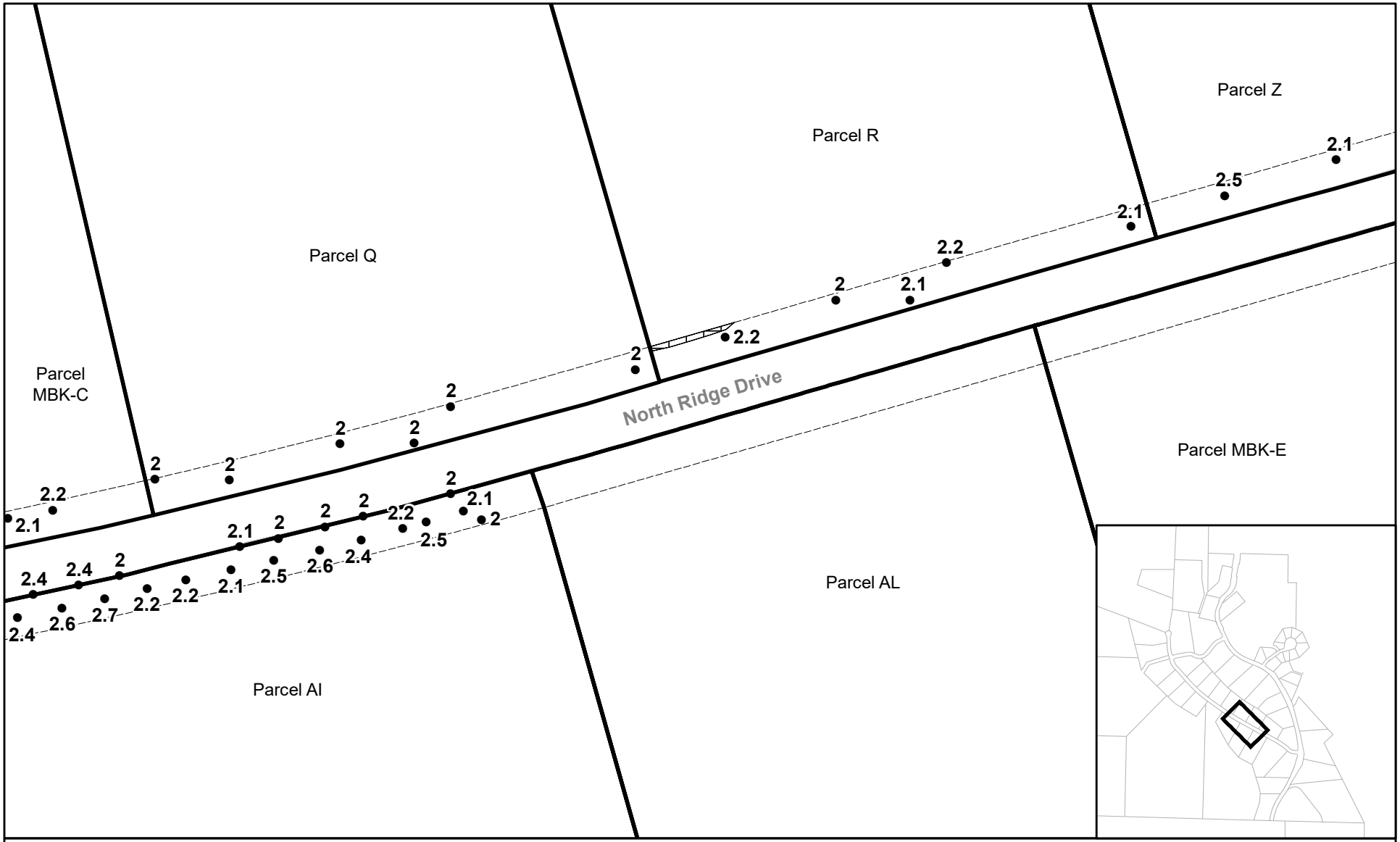
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
North Ridge Drive
440-1100 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd


Parcel MBK-A
Parcel MBK-B
Parcel MBK-C
Parcel AI
Parcel BL
Parcel MBK-F
1.7 1.5 1.4 1.4 2 2 2 2 2 2.1 1.5 2.3 2.3 2 2 2.1 2.1 2.3 2.2 2.2 2.2 2.1 2.1
1.3 1.5 1.4 1.6 1.7 1.7 1.3 1.5 2.1 2.1 2.3 2.1 2.6 2.6 2.4 2.6 2.4 2.2 2.1 2 2.1 2.2 2 2.1 2.2 2.1 2.1 2 2 2.1
2 1.6 2.2 2.3 2 1.1 2.3 3 2.2 2.3 3.1 3.2 3.1 3.3 2.2 2.1 2.7 2.7 2.4 2.6 2.4 2.4
Legend
Depth of Cap (Ft)
Parcel Boundary
Edge of Road
Excavation Boundary
Marker Barrier
Note: Protective liner installed under covered decks and in crawlspaces.
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.
N
0 25 50
Feet
Depth of Protective Cap
North Ridge Estates Superfund Site
North Ridge Drive
1100-1760 feet
Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

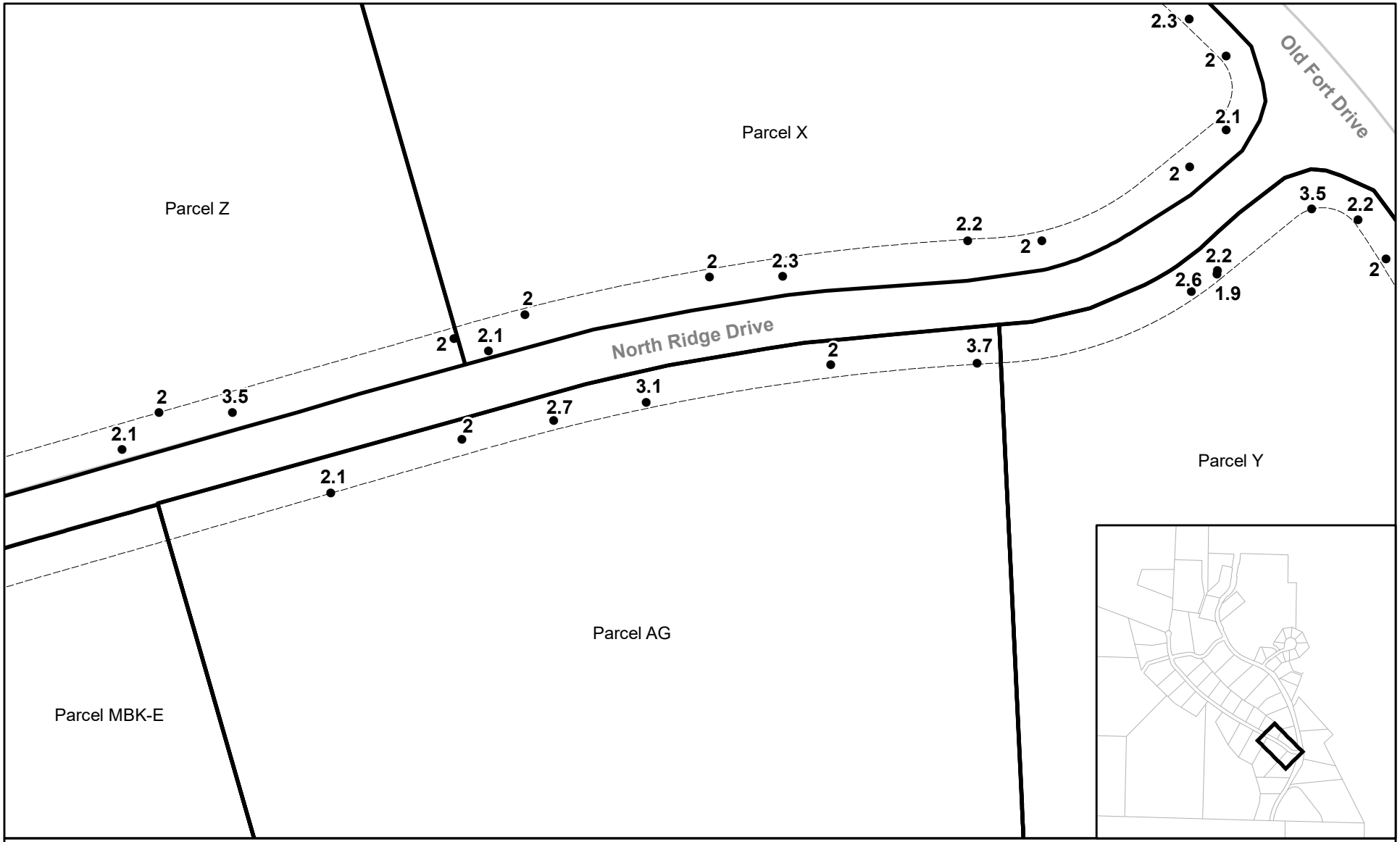
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
North Ridge Drive
1760-2450 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

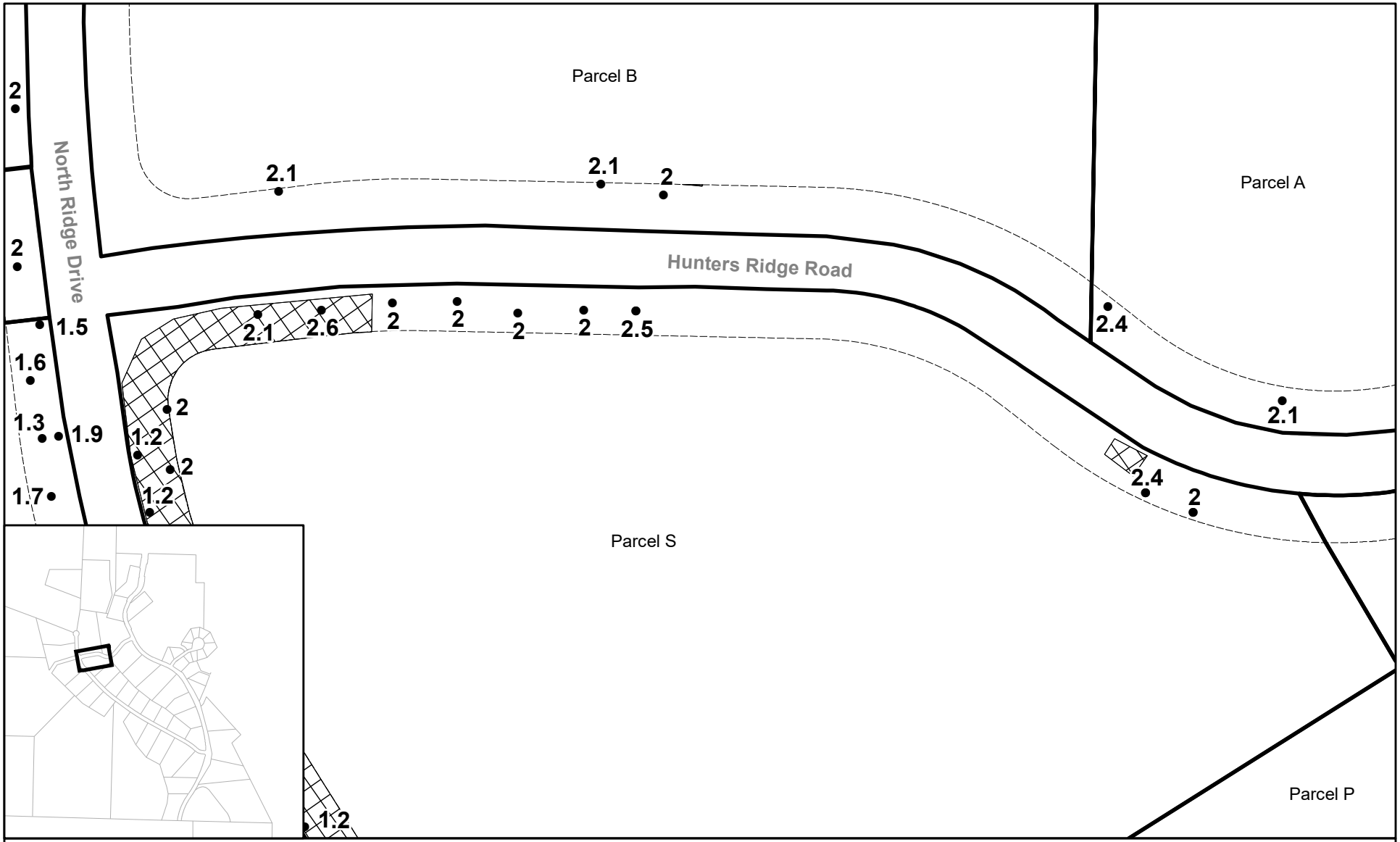
Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
North Ridge Drive
2450-3130 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

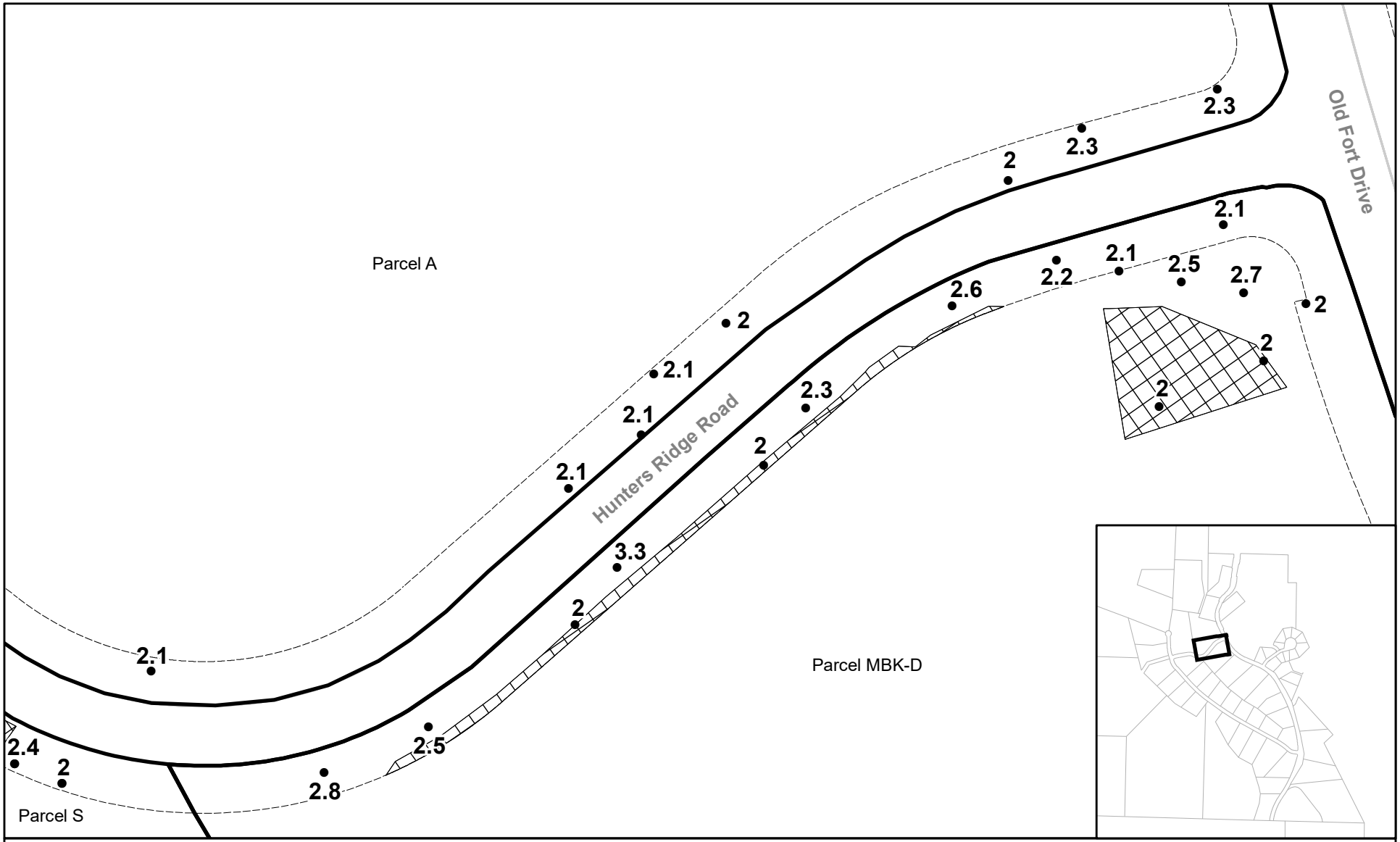
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Hunters Ridge
Road 0-540 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

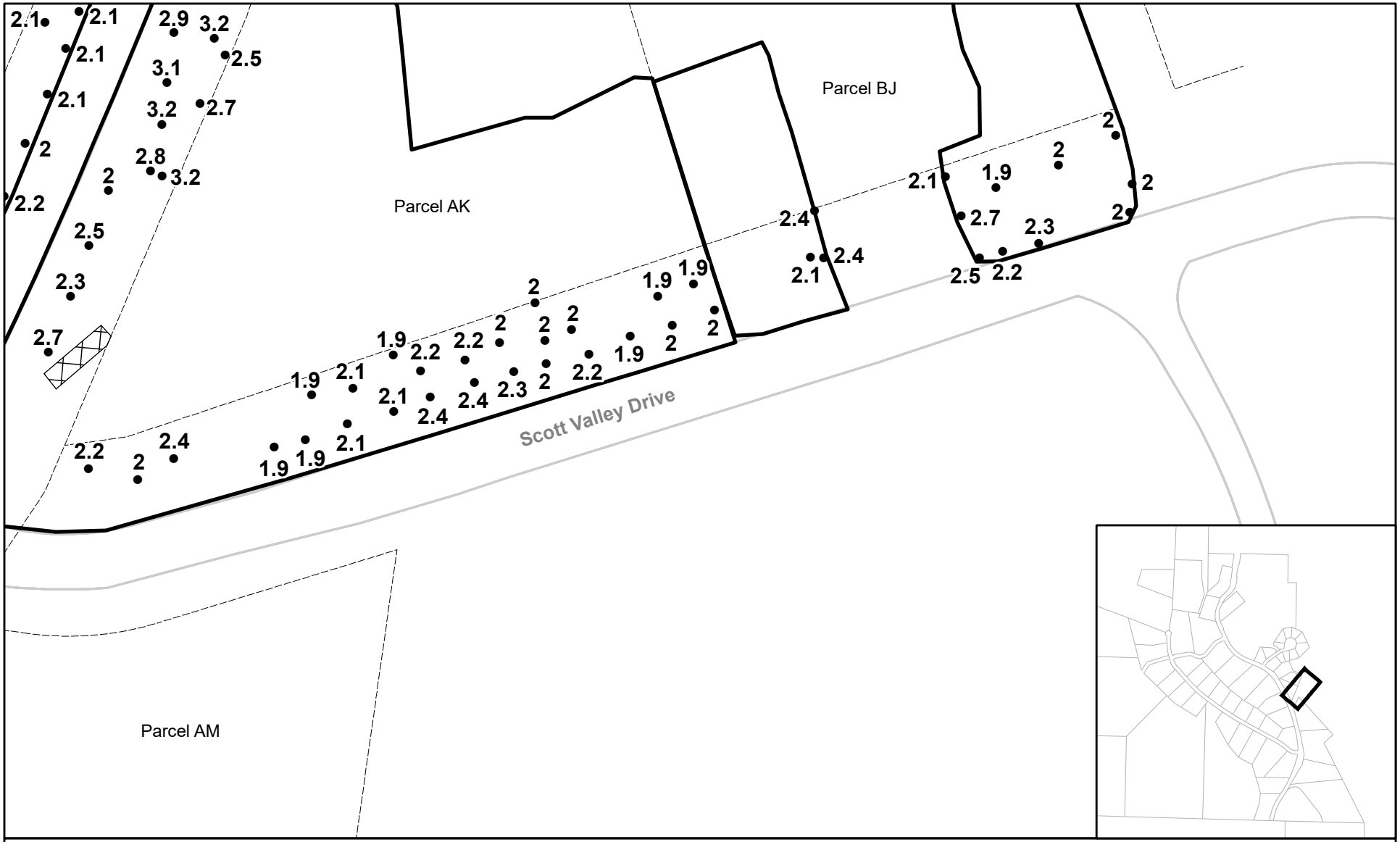
Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Hunters Ridge
Road 440-1040

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd



Legend

- Depth of Cap (Ft)
- Parcel Boundary
- Edge of Road
- Excavation Boundary
- Marker Barrier

Note: Protective liner installed under covered decks and in crawlspaces.

Control points provided by the Excavation and Restoration Contractor on May 22, 2019. Location of surface and subsurface features are approximate.

N

0 25 50
Feet

Depth of Protective Cap
North Ridge Estates Superfund Site
Scott Valley Drive
0-560 feet

Document Path: J:\114386_NorthRidgeEstates\MXD\ParcelMapbooks\CapDepthMap_ROW_grid.mxd

Appendix D

Appendix D

Earthwork Notification and Reporting Form

North Ridge Estates Earthwork Notification and Reporting Form

This Form consists of two parts: *Notification* and *Reporting*. The *Notification Section* is required to be completed and submitted by the property owner or representative to the Department of Environmental Quality (DEQ) at least 90 days prior to the date any ground disturbing or construction activities are scheduled to begin except for emergencies, system failures, or time-critical repairs. **Written approval from DEQ is required before proceeding with activities.** The *Reporting Section* is required to be completed and submitted by the property owner or representative to the DEQ within 45 days of the completion of work.

This Form is not required for minor activities such as installation of fence posts, plantings, or other such activities that go no deeper than two feet below the ground surface and conclude with the protective cap being restored to original grade.

Owners should ensure excavation work does not impact underground utilities by calling the Oregon Utility Notification Center (811) prior to performing any excavation activities.

Am I required to complete this form and perform associated requirements? Yes. The submittal of this *North Ridge Estates Earthwork Notification and Reporting Form* and following any requirements (i.e. using an Oregon-licensed asbestos abatement company during ground disturbing action) specified by DEQ is required by the Easement & Equitable Servitude (deed restriction) recorded on your property. Failure to submit the Form and follow requirements may result in enforcement action and civil penalties.

Why do I have to do this? Asbestos contaminated material and asbestos fibers remain in soils under the protective cap constructed on your property. Working with DEQ will prevent exposure to you, other residents, and workers to asbestos fibers in soil, prevent migration of asbestos contamination to clean areas, and ensure contaminated soil is properly handled and disposed.

Who pays for preparation of the form and any requirements? The property owner is responsible for all costs (including the Oregon-licensed asbestos abatement company) associated with any voluntary ground disturbing or construction activities performed on their property in accordance with the Easement & Equitable Servitude. There is no cost associated with the review of the Form by DEQ.

What does the protective cap look like? Multiple types of materials were used as protective caps including but not limited to minimum of two-feet of clean soil, asphalt and concrete surfaces, large rock surfaces, and liners (i.e., below covered porches and in crawlspaces).

Where is the protective cap located on my property? Protective caps were installed on the entire property of the majority of homes within the North Ridge Estates Subdivision following excavation activities. Some properties, generally on the east side of Old Fort Rd., have protective caps on only a portion of the property. As-built drawings for each property were prepared following the completion of the cap installation. These drawings show the location excavated and capped areas.

Where can I find a copy of the easement & equitable servitude and as-built drawings for my property? These documents may be viewed on-line through DEQ's Environmental Cleanup Site Information (ECSI) database.
Go to http://www.oregon.gov/deq/pages/index.aspx, under the "Hazards and Cleanup" section, select "Environmental Cleanup Site Information Database" select "Search complete ECSI database", then enter NRE in the Site Name box and click "Submit" at the bottom of the page. Next, find your property and click the Site ID No. (i.e. 6014) in the Site ID/Info column. Scroll down to the Site Document section to select the documents. If you do not have web access or need assistance, please contact the DEQ project manager listed below.

Where do I submit this form? Submit the form to the DEQ project manager listed below.

Who do I call with questions? Please contact the DEQ project manager listed below with any questions.

Katie Daugherty
DEQ Project Manager
Phone: 503-229-6748
Fax: 503-229-6124
700 NE Multnomah St., Suite 600
Portland, OR 97232
Email: Daugherty.Katie@deq.state.or.us

North Ridge Estates Earthwork Notification and Reporting Form
Notification Section

Contact Person Information	Property Owner Information
Name: _____	Same as Contact Person? Yes No
Company: _____	Name: _____
Mailing Address: _____	Mailing Address: _____
City: _____ State: _____ Zip: _____	City: _____ State: _____ Zip: _____
Phone: _____	Phone: _____
Email: _____	Email: _____

Property Address Where Work Will be Performed: _____

Form Completed By: _____

Describe Work to be Performed: _____
_____
_____
_____

Expected Depth of Work: _____ feet below ground surface

Date Excavation or Construction Actions Expected to Start: _____

Visit www.Oregon.gov/DEQ for a list of Oregon licensed asbestos abatement contractors. Select the *Asbestos Information for Homeowners* topic and then select the *Hiring the Right Contractor* topic to view the current list.

Proposed Asbestos Abatement Company Name: _____
Contact: _____ Phone: _____

- □ Attach a drawing showing the approximately location of work (See the cover page for directions on finding your as-built drawings on-line). Drawing must show at a minimum major site features (i.e. house, driveway) and location of planned excavation or construction activities.

Submit the form to:

Katie Daugherty, DEQ Project Manager
Via Email: Daugherty.Katie@deq.state.or.us
Via Mail: 700 NE Multnomah St., Suite 600, Portland, OR 97232

Questions? Call 503-229-6748
Via Fax: 503-229-6124

DEQ to Complete Date Received: _____

Will work breach protective cap?

□ **Yes** Reason: □ work deeper than cap □ work disturbed liner □ other: _____

If Yes, use of Oregon licensed asbestos abatement contractor required to perform ground disturbing portions of work and manage contaminated material generated. Excavated soil required to go to a landfill that accepts asbestos contaminated materials.

□ **No** Reason: □ work less than cap depth □ work will not disturb liner □ other: _____

If no, completion of Reporting Section not required.

□ **Additional Information Needed**. Specify: _____
Additional Information Received on: _____

□ DEQ approves work described above to proceed.
Approved by: _____ Date Approved: _____

□ DEQ approval not required as work is not expected to breach cap (i.e. cap is > 2 feet in this area).
Reviewed by: _____ Date: _____

North Ridge Estates Earthwork Notification and Reporting Form
Reporting Section

Reporting Section Completed By:

Name: _____
Company: _____
Mailing Address: _____
City:_____State:_____Zip:_____
Phone: _____
Email: _____

Asbestos Abatement Company that performed the cap disturbing work

Same as Contact Person? Yes No
Name: _____
Company: _____
Mailing Address: _____
City:_____State:_____Zip:_____
Phone: _____
Email: _____

Dates Asbestos Abatement Company performed work: _____

Attach the following:

- ☐ Drawing showing actual location of cap disturbing work
- ☐ Photos of Restored Area
- ☐ Documentation from the Asbestos Abatement Company for work completed
- ☐ Landfill Disposal Receipts for asbestos contaminated material

Submit the form to:

Katie Daugherty, DEQ Project Manager
Via Email: Daugherty.Katie@deq.state.or.us
Via Mail: 700 NE Multnomah St., Suite 600, Portland, OR 97232
Via Fax: 503-229-6124

Questions? Call 503-229-6748

DEQ to Complete Date Received: _____

All required documentation provided? ☐ Yes ☐ No Explain: _____

Follow-up Required? ☐ Yes Explain: _____ ☐ No

☐ Cap restoration confirmed during annual site inspection or other site visit.

Inspected by: _____ ☐ DEQ ☐ Contractor _____

Date Inspected: _____

Appendix E

Appendix E

Operation and Maintenance Cost Estimate

North Ridge Estates Superfund, Operable Unit 1
Operation and Maintenance Preliminary Cost Estimate

Introduction

CDM Federal Programs Corporation (CDM Smith) has been tasked by the U.S. Environmental Protection Agency (EPA) to prepare an opinion of probable operation and maintenance (O&M) cost for the remedial action implemented for Operable Unit 1 (OU1) at the North Ridge Estates Superfund Site, (CERCLIS No. ORN001002476) (herein referred to as the "Site"), located in Klamath County, Oregon.

The opinion of probable O&M cost estimate was developed to provide EPA and Oregon Department of Environmental Quality (ODEQ) with a cost basis for establishing O&M activities, costs for routine and non-routine remedy maintenance, annual site inspections, and cost for five-year reviews, as described in this O&M plan.

Methodology and Cost Guidance

The opinion of probable O&M cost is based on the methodology as described in the following cost guidance documents, as applicable:

- A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 540-R-00-002 (July 2000).
- Civil Works Construction Cost Index System (CWCCIS), EM 1110-2-1304, 30 September 2019.

This opinion of probable O&M cost was prepared using the Micro Computer Aided Cost Engineering System (MCACES) Second Generation (MII) software version 4.4.2 and Microsoft Excel. Costs were obtained from vendor quotes, RS Means-CostWorks 2020 cost database, Foreign Labor Certification Data Center, and MCACES MII equipment rate database.

Key Assumptions for the Scope of the Estimates

Key assumptions for the scope of the opinion of probable O&M cost estimates includes:

1. O&M cost incurred by EPA includes:
    a. Five-year review site inspection
    b. Five-year review report
2. O&M cost incurred by ODEQ includes:
    a. O&M contractor project management costs including managing budget and schedule, monthly reporting, coordination with ODEQ, tracking storm events, preparatory work and purchasing materials.
    b. Annual non-intrusive/visual site inspection and following a severe storm event. Monitoring of institutional controls would also be carried out annually.
    c. Maintenance of onsite repositories (Swimming Pool and Memorial Park) include annual minor maintenance of protective cap over repositories. It is assumed that mowing would not be required because of the native seed mix used which is intended to be low maintenance.

d. It is assumed that 0.5% of the repository cap and up to a depth of 6-inches would require restoration during the first year of O&M and would be reduced by 50% for the second year of O&M and subsequently reduced to 25% for the rest of the O&M period annually.

e. Major breaches of protective cap within the Site are assumed to occur once every 15 years. It is assumed that 1.5% of protective cap (up to a depth of 24-inches) would require restoration. It is further assumed that 1% and 0.5% of protective cap would be within steep slopes and shallow slopes, respectively. In addition, 10% of drainage channels would also require restoration.

f. Restored areas of the cap would be seeded.

g. It is assumed that soil required for minor restoration would be purchased locally. For restoration of major breaches, soil would be excavated and processed from the designated borrow source area and amended with organics.

h. It is assumed that a major breach would require areas downgradient of the breach to be evaluated because of the potential for cross-contamination. Sampling and Analysis Plan (SAP)/ Quality Assurance Project Plan (QAPP) would be developed to carryout activity based sampling (ABS). It is assumed that a minimum of 4 ABS would be conducted.

i. Compensation would be sought for damages due to others negligent activities within the Site. It is assumed that cost required to seek compensation would be incurred by ODEQ, and is assumed to occur once every 10 years.

Following site maintenance activities would be the responsibility of the property owner, utility provider, and/or Klamath County. Thus, these maintenance activities were not included in the cost estimate.

1. Property owners are responsible for site maintenance activities within the extent of their property and includes the following:

   a. Minor breach/repairs to the protective cap and general maintenance of vegetation

   b. Stormwater control and conveyance features

   c. Maintenance and periodic repairs of driveway and walkway

   d. Maintenance of crawlspace liners and liners under the covered decks

   e. Property owner and/or utility provider would be responsible for restoring the protective cap breaches that result due to an urgent situation like waterline or septic system repair.

2. Klamath County is responsible for following site maintenance activities:

   a. Stormwater control and conveyance features within the county right-of-way

   b. Roadways

Key Assumptions for Estimate Preparation

Key assumptions for estimate preparation include:

1. The opinion of probable O&M cost was prepared using USACE's MCACES MII software. This is the software platform generally used by Federal agencies, including the EPA, to develop construction cost estimates for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial actions. The costs generated from the MII software platform were exported to Microsoft Excel to determine overall unit costs, as presented in the Unit Cost Development Table.

2. Microsoft Excel was used to present cost estimate summary and present value analysis.

3. The escalation rate used to adjust previous costs to current costs is based on the composite escalation index obtained from the U.S. Army Corps of Engineers Civil Works Construction Cost Index System (CWCCIS), EM 1110-2-1304, 30 September 2019.

4. This estimate uses prevailing wage labor rates from www.FLCdatacenter.com (07/2019 to 06/2020) for craft, non-craft and professional labor costs.

5. Quantities used in the estimate preparation are presented in the Quantity (QTO) Development Table. Conversion factors used for quantity estimation are same as those presented in the final remedial design cost estimate for the North Ridge Estates Site.

6. Quantities used for the development of O&M cost estimate were developed using the North Ridge Estates Superfund Site, Operable Unit 1 Remedial Design drawings.

7. A combined scope and bid contingency of 20% was applied to the estimate. 10% scope and 10% bid contingency is the based on the low end of the recommended range in EPA 540-R-00-002.

8. Technical support, and project management (by EPA and stakeholders) costs are based on the recommended range in EPA 540-R-00-002 and engineering judgement.

9. The cost estimate is expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented and methodology used for estimating. CDM Smith has no control over the cost of labor, materials, equipment, or services furnished, over contractor's methods of determining prices, market conditions, or negotiating conditions. CDM Smith does not guarantee that this probable O&M cost will not vary from actual cost.

Attachments

- Table PV-O&M: Opinion of Probable Operation and Maintenance Cost Incurred by Oregon Department of Environmental Quality (ODEQ)
- Table CS-O&M: Opinion of Probable Operation and Maintenance Cost
- Table PV-Five Year Review: Opinion of Probable Operation and Maintenance Cost Incurred by U.S. Environmental Protection Agency
- Table CS-Five Year Review: Opinion of Probable Operation and Maintenance Cost
- Unit Cost Development Table
- Quantity (QTO) Development Table

- Annual Escalation Rate Factors Table
- Annual Discount Rate Factors Table
- MII Cost Report
  - Title Page/Library and Markup Properties
  - Project Cost Summary Report
  - MII Report Backup Information

Probable Operation and Maintenance Cost Incurred by ODEQ

TABLE PV - O&M

PRESENT VALUE ANALYSIS

Opinion of Probable Operation and Maintenance Cost
Incurred by Oregon Department of Environmental Quality (ODEQ)

Site: North Ridge Estates
Location: Klamath County, Oregon
Phase: Operation and Maintenance
Base Year: 2020

Year[1]	Annual Site Maintenance and Monitoring Costs	Periodic Costs (Major Breach Repair)	Periodic Costs (Compensation)	Total Annual Expenditure[2]	Escalation Factor	Escalated Cost[3]	Discount Factor (7.0%)	Present Value[4]
0	$0	$0	$0	$0	1.0000	$0	1.0000	$0
1	$62,000	$0	$0	$62,000	1.0300	$63,860	0.9346	$59,684
2	$55,000	$0	$0	$55,000	1.0609	$58,350	0.8734	$50,963
3	$52,000	$0	$0	$52,000	1.0927	$56,822	0.8163	$46,384
4	$52,000	$0	$0	$52,000	1.1255	$58,526	0.7629	$44,650
5	$52,000	$0	$0	$52,000	1.1593	$60,282	0.7130	$42,981
6	$52,000	$0	$0	$52,000	1.1941	$62,091	0.6663	$41,371
7	$52,000	$0	$0	$52,000	1.2299	$63,954	0.6227	$39,824
8	$52,000	$0	$0	$52,000	1.2668	$65,872	0.5820	$38,337
9	$52,000	$0	$0	$52,000	1.3048	$67,848	0.5439	$36,903
10	$52,000	$0	$25,000	$77,000	1.3439	$103,482	0.5083	$52,600
11	$52,000	$0	$0	$52,000	1.3842	$71,980	0.4751	$34,198
12	$52,000	$0	$0	$52,000	1.4258	$74,140	0.4440	$32,918
13	$52,000	$0	$0	$52,000	1.4685	$76,364	0.4150	$31,691
14	$52,000	$0	$0	$52,000	1.5126	$78,655	0.3878	$30,502
15	$52,000	$224,000	$0	$276,000	1.5580	$429,998	0.3624	$155,831
16	$52,000	$0	$0	$52,000	1.6047	$83,445	0.3387	$28,263
17	$52,000	$0	$0	$52,000	1.6529	$85,948	0.3166	$27,211
18	$52,000	$0	$0	$52,000	1.7024	$88,526	0.2959	$26,195
19	$52,000	$0	$0	$52,000	1.7535	$91,183	0.2765	$25,212
20	$52,000	$0	$25,000	$77,000	1.8061	$139,070	0.2584	$35,936
21	$52,000	$0	$0	$52,000	1.8603	$96,736	0.2415	$23,362
22	$52,000	$0	$0	$52,000	1.9161	$99,637	0.2257	$22,488
23	$52,000	$0	$0	$52,000	1.9736	$102,627	0.2109	$21,644
24	$52,000	$0	$0	$52,000	2.0328	$105,705	0.1971	$20,834
25	$52,000	$0	$0	$52,000	2.0938	$108,877	0.1842	$20,055
26	$52,000	$0	$0	$52,000	2.1566	$112,143	0.1722	$19,311
27	$52,000	$0	$0	$52,000	2.2213	$115,507	0.1609	$18,585
28	$52,000	$0	$0	$52,000	2.2879	$118,973	0.1504	$17,893
29	$52,000	$0	$0	$52,000	2.3566	$122,542	0.1406	$17,229
30	$52,000	$224,000	$25,000	$301,000	2.4273	$730,606	0.1314	$96,002
TOTALS:	$1,573,000	$448,000	$75,000	$2,096,000		$3,593,747		$1,159,057
TOTAL PRESENT VALUE OF O&M COSTS[5]								**$1,160,000**

Notes:

For cost estimating purposes, O&M costs are presented for a 30-year period after determination of O&F.

Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented and methodology used for estimating. This cost accuracy range is consistent with EPA's Remedial Design/Remedial Action Handbook (EPA 1995) for preliminary development of O&M activities and responsibilities.

[1] Duration is assumed to be 30 years for present value analysis.

[2] Total annual expenditure is the total cost per year with no discounting.

[3] Escalation cost is the total cost per year including an escalation rate for that year. See Table PV-AERFT for details.

[4] Present value is the total cost per year including a 7.0% discount factor for that year. See Table PV-ADRFT for details.

[5] Total present value is rounded to the nearest $10,000. Inflation and depreciation are excluded from the present value cost.

TABLE CS - O&M

Opinion of Probable Operation and Maintenance Cost

COST ESTIMATE SUMMARY

Site: North Ridge Estates
Location: Klamath County, Oregon
Phase: Operation and Maintenance
Base Year: 2020
Date: April 7, 2020

Description: Summary of Probable Operation and Maintenance Cost Incurred by Oregon Department of Environmental Quality (ODEQ)

ANNUAL COST - SITE MAINTENANCE AND MONITORING (Year 1)

DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
General Project Management and Coordination	1	LS	$12,820	$12,820	Contractor coordination with ODEQ and tracking storm events.
Visual Site Inspections - Annual [1]	1	LS	$9,040	$9,040	Assumes 4 days over the period of 1 year for inspection
Annual Inspection Report	1	LS	$3,280	$3,280	
Maintenance of Onsite Repositories [2]					
Minor Protective Cap Maintenance - Year 1	1	LS	$10,730	$10,730	
Seeding	1	LS	$2,660	$2,660	
Monitor Institutional Controls [3]	1	LS	$3,010	$3,010	
SUBTOTAL				$41,540	
Contingency (Scope and Bid)	20%			$8,308	10% Scope, 10% Bid (Low end of the recommended range in EPA 540-R-00-002).
SUBTOTAL				**$49,848**	
Project Management [4]	10%			$4,985	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support [5]	15%			$7,477	Middle value of the recommended range in EPA 540-R-00-002 was used.
TOTAL				$62,310	
TOTAL ANNUAL O&M COST				**$62,000**	Total capital cost is rounded to the nearest $1,000.

ANNUAL COST - SITE MAINTENANCE AND MONITORING (Year 2)

DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
General Project Management and Coordination	1	LS	$12,820	$12,820	Contractor coordination with ODEQ and tracking storm events.
Visual Site Inspections - Annual	1	LS	$9,040	$9,040	Assumes 4 days over the period of 1 year for inspection
Annual Inspection Report	1	LS	$3,280	$3,280	
Maintenance of Onsite Repositories					
Minor Protective Cap Maintenance - Year 2	1	LS	$6,000	$6,000	Assumes 50% of Year 1
Seeding	1	LS	$2,660	$2,660	
Monitor Institutional Controls	1	LS	$3,010	$3,010	
SUBTOTAL				$36,810	
Contingency (Scope and Bid)	20%			$7,362	10% Scope, 10% Bid (Low end of the recommended range in EPA 540-R-00-002).
SUBTOTAL				**$44,172**	
Project Management	10%			$4,417	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support	15%			$6,626	Middle value of the recommended range in EPA 540-R-00-002 was used.
TOTAL				$55,215	
TOTAL ANNUAL O&M COST				**$55,000**	Total capital cost is rounded to the nearest $1,000.

TABLE CS - O&M

Opinion of Probable Operation and Maintenance Cost

COST ESTIMATE SUMMARY

Site: North Ridge Estates
Location: Klamath County, Oregon
Phase: Operation and Maintenance
Base Year: 2020
Date: April 7, 2020

Description: Summary of Probable Operation and Maintenance Cost Incurred by Oregon Department of Environmental Quality (ODEQ)

ANNUAL COST - SITE MAINTENANCE AND MONITORING (Years 3 through 30)

DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
General Project Management and Coordination	1	LS	$12,820	$12,820	Contractor coordination with ODEQ and tracking storm events.
Visual Site Inspections - Annual	1	LS	$9,040	$9,040	Assumes 4 days over the period of 1 year for inspection
Annual Inspection Report	1	LS	$3,280	$3,280	
Maintenance of Onsite Repositories					
Minor Protective Cap Maintenance - Year 3 Onward	1	LS	$3,630	$3,630	Assumes 25% of Year 1
Seeding	1	LS	$2,660	$2,660	
Monitor Institutional Controls	1	LS	$3,010	$3,010	
SUBTOTAL				$34,440	
Contingency (Scope and Bid)	20%			$6,888	10% Scope, 10% Bid (Low end of the recommended range in EPA 540-R-00-002).
SUBTOTAL				**$41,328**	
Project Management	10%			$4,133	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support	15%			$6,199	Middle value of the recommended range in EPA 540-R-00-002 was used.
TOTAL				$51,660	
TOTAL ANNUAL O&M COST				**$52,000**	Total capital cost is rounded to the nearest $1,000.

PERIODIC COST - MAJOR BREACHES (Year 15 and 30)

DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
Major Breaches of Protective Cap [6]					
Soil, Bulk Delivered	1	LS	$87,670	$87,670	Assumes once every 15 years
Placement and Grading of Soil	1	LS	$23,510	$23,510	
Seeding	1	LS	$7,940	$7,940	
Erosion Control Blanket	1	LS	$2,140	$2,140	
Sampling - Downgradient of Major Breach [6]					
SAP/QAPP Development	1	LS	$16,860	$16,860	Assumes SAP/QAPP will be developed or updated every 15 years
Activity Based Sampling (ABS)	4	EA	$1,910	$7,640	
SUBTOTAL				$145,760	
Contingency (Scope and Bid)	20%			$29,152	10% Scope, 10% Bid (Low end of the recommended range in EPA 540-R-00-002).
SUBTOTAL				**$174,912**	
Project Management	8%			$13,993	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support	20%			$34,982	Upper value of the recommended range in EPA 540-R-00-002 was used.
TOTAL				$223,887	
TOTAL PERIODIC COST				**$224,000**	Total capital cost is rounded to the nearest $1,000.

TABLE CS - O&M

Opinion of Probable Operation and Maintenance Cost

COST ESTIMATE SUMMARY

Site: North Ridge Estates
Location: Klamath County, Oregon
Phase: Operation and Maintenance
Base Year: 2020
Date: April 7, 2020

Description: Summary of Probable Operation and Maintenance Cost Incurred by Oregon Department of Environmental Quality (ODEQ)

PERIODIC COST - COMPENSATION (Year 10, 20, and 30)

DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
Compensation for Damages [7]	1	LS	$17,080	$17,080	
SUBTOTAL				$17,080	
Contingency (Scope and Bid)	20%			$3,416	10% Scope, 10% Bid (Low end of the recommended range in EPA 540-R-00-002).
SUBTOTAL				**$20,496**	
Project Management	10%			$2,050	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support	10%			$2,050	Lower value of the recommended range in EPA 540-R-00-002 was used.
TOTAL				$24,596	
TOTAL PERIODIC COST				**$25,000**	Total capital cost is rounded to the nearest $1,000.

Notes:

Percentages used for contingency and professional/technical services costs (indirect costs) are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 540-R-00-002 (July 2000).

Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented and methodology used for estimating.

[1] Non-intrusive visual site inspections will be conducted to ensure integrity of the physical remedy or engineered control remains intact and assumed to be performed at least annually

[2] Maintenance of onsite repositories (Swimming Pool and Memorial Park) include general maintenance of protective cover over the repositories, repairing of minor breaches that occur from general wear and tear or erosion resulting in exposure to asbestos containing material.

[3] ICs evaluation will be conducted to assess whether the selected IC instrument remains in place and whether the ICs are enforced such that they meet the stated objectives and performance goals and provide protection required by the response.

[4] Project management includes, but is not limited to, planning and reporting, community relations support, contract administration, permitting (if needed), and legal services outside of ICs.

[5] Technical support includes, but is not limited to, oversight of O&M activities and progress reporting.

[6] A major breach occurs when the protective cap is breached, thus; significantly exposing the asbestos-contaminated soils beneath. Asbestos-contaminated soil exposed by a major breach will be capped in-place by restoring the original protective cap. A major breach may also require areas downgradient of the breach to be evaluated because of the potential for cross-contamination. Sampling and analysis would be conducted to confirm that contamination did not migrate outside of the breached area.

[7] If damages were caused by others through negligent activities, ODEQ, at their discretion, may seek compensation or other measures to repair the damages.

Abbreviations:

EA Each
LS Lump Sum
QTY Quantity

Probable Operation and Maintenance Cost Incurred by EPA

TABLE PV - FIVE-YEAR REVIEW

PRESENT VALUE ANALYSIS

Opinion of Probable Operation and Maintenance Cost
Incurred by U.S. Environmental Protection Agency

Site: North Ridge Estates
Location: Klamath County, Oregon
Phase: Operation and Maintenance
Base Year: 2020

Year[1]	Annual Site Maintenance and Monitoring Costs	Periodic Site Maintenance Costs	Periodic Costs (Five-Year Site Reviews)	Total Annual Expenditure[2]	Escalation Factor	Escalated Cost[3]	Discount Factor (7.0%)	Present Value[4]
0	$0	$0	$0	$0	1.0000	$0	1.0000	$0
1	$0	$0	$0	$0	1.0300	$0	0.9346	$0
2	$0	$0	$0	$0	1.0609	$0	0.8734	$0
3	$0	$0	$0	$0	1.0927	$0	0.8163	$0
4	$0	$0	$0	$0	1.1255	$0	0.7629	$0
5	$0	$0	$39,000	$39,000	1.1593	$45,212	0.7130	$32,236
6	$0	$0	$0	$0	1.1941	$0	0.6663	$0
7	$0	$0	$0	$0	1.2299	$0	0.6227	$0
8	$0	$0	$0	$0	1.2668	$0	0.5820	$0
9	$0	$0	$0	$0	1.3048	$0	0.5439	$0
10	$0	$0	$39,000	$39,000	1.3439	$52,413	0.5083	$26,641
11	$0	$0	$0	$0	1.3842	$0	0.4751	$0
12	$0	$0	$0	$0	1.4258	$0	0.4440	$0
13	$0	$0	$0	$0	1.4685	$0	0.4150	$0
14	$0	$0	$0	$0	1.5126	$0	0.3878	$0
15	$0	$0	$39,000	$39,000	1.5580	$60,761	0.3624	$22,020
16	$0	$0	$0	$0	1.6047	$0	0.3387	$0
17	$0	$0	$0	$0	1.6529	$0	0.3166	$0
18	$0	$0	$0	$0	1.7024	$0	0.2959	$0
19	$0	$0	$0	$0	1.7535	$0	0.2765	$0
20	$0	$0	$39,000	$39,000	1.8061	$70,438	0.2584	$18,201
21	$0	$0	$0	$0	1.8603	$0	0.2415	$0
22	$0	$0	$0	$0	1.9161	$0	0.2257	$0
23	$0	$0	$0	$0	1.9736	$0	0.2109	$0
24	$0	$0	$0	$0	2.0328	$0	0.1971	$0
25	$0	$0	$39,000	$39,000	2.0938	$81,657	0.1842	$15,041
26	$0	$0	$0	$0	2.1566	$0	0.1722	$0
27	$0	$0	$0	$0	2.2213	$0	0.1609	$0
28	$0	$0	$0	$0	2.2879	$0	0.1504	$0
29	$0	$0	$0	$0	2.3566	$0	0.1406	$0
30	$0	$0	$39,000	$39,000	2.4273	$94,663	0.1314	$12,439
TOTALS:	$0	$0	$234,000	$234,000		$405,144		$126,578
TOTAL PRESENT VALUE OF 5-YEAR REVIEW COSTS								**$130,000**

Notes:

For cost estimating purposes, O&M costs are presented for a 30-year period after determination of O&F.

Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented and methodology used for estimating. This cost accuracy range is consistent with EPA's Remedial Design/Remedial Action Handbook (EPA 1995) for preliminary development of O&M activities and responsibilities.

[1] Duration is assumed to be 30 years for present value analysis.

[2] Total annual expenditure is the total cost per year with no discounting.

[3] Escalation cost is the total cost per year including an escalation rate for that year. See Table PV-AERFT for details.

[4] Present value is the total cost per year including a 7.0% discount factor for that year. See Table PV-ADRFT for details.

[5] Total present value is rounded to the nearest $10,000. Inflation and depreciation are excluded from the present value cost.

TABLE CS - FIVE-YEAR REVIEW

Opinion of Probable Operation and Maintenance Cost

COST ESTIMATE SUMMARY

Site: North Ridge Estates
Location: Klamath County, Oregon
Phase: Operation and Maintenance
Base Year: 2020
Date: April 7, 2020

Description: Summary of Probable Operation and Maintenance Cost Incurred by U.S. Environmental Protection Agency

5-YEAR SITE REVIEW PERIODIC COSTS (Years 5, 10, 15, 20, 25, and 30)

DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
Visual Site Inspections	1	LS	$6,650	$6,650	Assumes 3 days for inspection
Five-Year Review Report	1	LS	$19,490	$19,490	
SUBTOTAL				**$26,140**	
Contingency (Scope and Bid)	20%			$5,228	10% Scope, 10% Bid (Low end of the recommended range in EPA 540-R-00-002).
SUBTOTAL				**$31,368**	
Project Management	10%			$3,137	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support	15%			$4,705	Middle value of the recommended range in EPA 540-R-00-002 was used.
TOTAL				**$39,210**	
TOTAL PERIODIC COST				**$39,000**	Total capital cost is rounded to the nearest $1,000.

Notes:
Percentages used for contingency and professional/technical services costs (indirect costs) are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 540-R-00-002 (July 2000).
Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented and methodology used for estimating.

Abbreviations:
LS Lump Sum

Probable Operation and Maintenance Cost Backup

- Unit Cost Development Table
- Annual Escalation Rate Factors Table
- Annual Discount Rate Factors Table

PROJECT:	North Ridge Estates	COMPUTED BY :	AIS	CHECKED BY:	TMM
JOB NO.:	114386 6460.EC1.02B.STUDY	DATE :	2/28/2018	DATE CHECKED:	4/6/2020
CLIENT:	USEPA	UPDATE :	4/2/2020	PAGE NO. :	Unit Cost

Description: Unit Cost Development

Escalation

Estimate preparation date: 3Q20

Cost estimate prep cost index: 912.75

Escalation indices (composite index) obtained from the U.S. Army Corps of Engineers Civil Works Construction Cost Index System (CWCCIS), EM 1110-2-1304, 30 September 2019.

Unit Cost Development Table

	UOM	Unit Cost	Qtr/Year	Esc. Index	Cost
5-Year Site Review - U.S. EPA					
Visual Site Inspections	LS	$6,654	3Q20	912.75	$6,650
Five-Year Review Report	LS	$19,494	3Q20	912.75	$19,490
Site Maintenance - ODEQ					
General Project Management and Coordination					
General Project Management and Coordination	LS	$12,821	3Q20	912.75	$12,820
Visual Site Inspections					
Visual Site Inspections - Annual	LS	$9,040	3Q20	912.75	$9,040
Annual Inspection Report	LS	$3,276	3Q20	912.75	$3,280
Maintenance of Onsite Repositories					
Minor Protective Cap Maintenance - Year 1	LS	$10,731	3Q20	912.75	$10,730
Minor Protective Cap Maintenance - Year 2	LS	$5,998	3Q20	912.75	$6,000
Minor Protective Cap Maintenance - Year 3 Onward	LS	$3,632	3Q20	912.75	$3,630
Seeding	LS	$2,660	3Q20	912.75	$2,660
Major Breaches of Protective Cap					
Soil, Bulk Delivered	LS	$87,675	3Q20	912.75	$87,670
Placement and Grading of Soil	LS	$23,505	3Q20	912.75	$23,510
Seeding	LS	$7,940	3Q20	912.75	$7,940
Erosion Control Blanket	LS	$2,142	3Q20	912.75	$2,140
Sampling - Downgradient of Major Breach					
SAP/QAPP Development	LS	$16,860	3Q20	912.75	$16,860
Activity Based Sampling (ABS)	EA	$1,909	3Q20	912.75	$1,910
Compensation for Damages					
Compensation for Damages	LS	$17,075	3Q20	912.75	$17,080
Monitor Institutional Controls					
Monitor Institutional Controls	LS	$3,008	3Q20	912.75	$3,010

Acronyms:

EA: each; LS: lump sum

TABLE PV-AERFT

ANNUAL ESCALATION RATE FACTORS TABLE

Site: North Ridge Estates
Location: Klamath County, Oregon
Phase: Operation and Maintenance
Base Year: 2020

Year		Cost Index [1]	Escalation Factor	Year		Cost Index [1]	Escalation Factor
0	2020	910.31	1.0000	26	2046	1963.17	2.1566
1	2021	937.62	1.0300	27	2047	2022.06	2.2213
2	2022	965.75	1.0609	28	2048	2082.73	2.2879
3	2023	994.72	1.0927	29	2049	2145.21	2.3566
4	2024	1024.56	1.1255	30	2050	2209.56	2.4273
5	2025	1055.30	1.1593				
6	2026	1086.96	1.1941				
7	2027	1119.57	1.2299				
8	2028	1153.15	1.2668				
9	2029	1187.75	1.3048				
10	2030	1223.38	1.3439				
11	2031	1260.08	1.3842				
12	2032	1297.89	1.4258				
13	2033	1336.82	1.4685				
14	2034	1376.93	1.5126				
15	2035	1418.23	1.5580				
16	2036	1460.78	1.6047				
17	2037	1504.61	1.6529				
18	2038	1549.74	1.7024				
19	2039	1596.24	1.7535				
20	2040	1644.12	1.8061				
21	2041	1693.45	1.8603				
22	2042	1744.25	1.9161				
23	2043	1796.58	1.9736				
24	2044	1850.47	2.0328				
25	2045	1905.99	2.0938				

Notes:

[1] Yearly composite cost index (weighted average) from the U.S. Army Corps of Engineers Civil Works Construction Cost Index System (CWCCIS), EM 1110-2-1304, 30 September 2019.

TABLE PV-ADRFT

PRESENT VALUE ANALYSIS

Annual Discount Rate Factors Table

Site: North Ridge Estates
Location: Klamath County, Oregon
Phase: Operation and Maintenance
Base Year: 2020

Discount Rate (Percent): 7.0

Year	Discount Factor[1,2]	Year	Discount Factor[1,2]
0	1.0000	26	0.1722
1	0.9346	27	0.1609
2	0.8734	28	0.1504
3	0.8163	29	0.1406
4	0.7629	30	0.1314
5	0.7130		
6	0.6663		
7	0.6227		
8	0.5820		
9	0.5439		
10	0.5083		
11	0.4751		
12	0.4440		
13	0.4150		
14	0.3878		
15	0.3624		
16	0.3387		
17	0.3166		
18	0.2959		
19	0.2765		
20	0.2584		
21	0.2415		
22	0.2257		
23	0.2109		
24	0.1971		
25	0.1842		

Notes:

[1] Annual discount factors were calculated using the formulas and guidance presented in Section 4.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.

[2] The real discount rate of 7.0% was obtained from "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000, Page 4-5.

MII Cost Report

North Ridge Estates Superfund Site

O&M

Klamath County, Oregon

Estimated by	CDM Federal Programs Corporation (CDM Smith)
Designed by	CDM Federal Programs Corporation (CDM Smith)
Prepared by	Schlebusch
Preparation Date	4/2/2020
Effective Date of Pricing	4/2/2020
Estimated Construction Time	365 Days

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Project Notes ii
Markup Properties iv
Project Cost Summary Report 1
00 NRE Superfund Site - O&M Costs 1
02 U.S. Environmental Protection Agency 1
02.01 Visual Site Inspections - Five-Year Site Reviews 1
02.02 Five-Year Review Report 1
03 Oregon Department of Environmental Quality 1
03.01 General Project Management and Coordination 1
03.02 Visual Site Inspections 2
03.03 Inspection Report 2
03.04 Maintenance of Onsite Repositories 2
03.04.01 Minor Protective Cap Maintenance 2
03.04.01.01 Year 1 2
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03.05.03.02 Erosion Control Blanket 5
03.06 Sampling - Downgradient of Major Breach 5
03.06.01 SAP/QAPP Development 5
03.06.02 Activity Based Sampling (ABS) 6
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Designed by
CDM Federal Programs Corporation (CDM Smith)

Estimated by
CDM Federal Programs Corporation (CDM Smith)

Prepared by
Schlebusch

Design Document	Final O&M Plan
Document Date	4/3/2020
District	EPA Region 10
Contact	CDM Smith - (816) 444-8270
Budget Year	2020
UOM System	Original

Direct Costs
LaborCost
EQCost
MatlCost
SubBidCost
Other Cost

Timeline/Currency

Preparation Date	4/2/2020
Escalation Date	9/30/2019
Eff. Pricing Date	4/2/2020
Estimated Duration	365 Day(s)
Currency	US dollars
Exchange Rate	1.000000

Costbook CB16EN: 2016 MII English Cost Book

Labor KCOR20: Labor Library - Washington 2020
Note: Wage rates for home and job office personnel and craft laborers based on April 2020 FLCdatacenter.com and Davis-Bacon Wage Determination for Klamath County, Oregon

Labor Rates
LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP16R08: MII Equipment 2016 Region 08
Note: 2016 Region 8 equipment library updated April 2020 with current COM and area specific sales tax, electricity, gas, and diesel fuel costs for Klamath Falls, Oregon.

08 NORTHWEST

Sales Tax	0.00
Working Hours per Year	1,480
Labor Adjustment Factor	1.05
Cost of Money	2.13
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.088
Gas	2.637
Diesel Off-Road	2.254
Diesel On-Road	2.798

Shipping Rates

Over 0 CWT	23.66
Over 240 CWT	16.88
Over 300 CWT	13.85
Over 400 CWT	12.00
Over 500 CWT	11.26
Over 700 CWT	9.51
Over 800 CWT	6.48

Date	Author	Note
4/3/2020 3:08:55 PM	Schlebusch	OPERATION AND MAINTENANCE PLAN NORTH RIDGE ESTATE SUPERFUND SITE, OU 1 KLAMATH COUNTY, OREGON 1.0 ESTIMATE PREPARATION: This cost estimate was prepared using the Micro Computer Aided Cost Engineering System (MCACES) Second Generation (MII) software version 4.4.2. The following supporting databases were used in the preparation of the cost estimate: updated version of EP16R08 (MII Equipment Region 8). The estimate is based on operation and maintenance plan for North Ridge Estates Superfund Site. The cost estimate is expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented and methodology used for estimating. CDM Smith has no control over the cost of labor, materials, equipment, or services furnished, over contractor's methods of determining prices, market conditions, or negotiating conditions. CDM Smith does not guarantee that this probable O&M cost will not vary from actual cost. 2.1 WAGE RATES: 2.1.1 Wage Rate Sources This estimate uses prevailing wage labor rates from www.FLCdatacenter.com (07/2019 to 06/2020) for craft, non-craft and professional labor costs, determination for Klamath County, Oregon 2.1.2 Taxes and Insurance The provided labor rate database also includes the contractor and subcontractor burden markups for labor: Federal/State Unemployment Taxes: 5.3% (0.8% Federal/4.5% State) Social Security Taxes: 7.65% Workmen's Compensation: Varies by contractor class 2.2 EQUIPMENT RATES: This estimate is based on the latest available/supported MCACES MII equipment rate database (EP16R08), which has been updated using the latest Region 8 Area Factors, as provided in Appendix B of Engineering Pamphlet EP 1110-1-8, Vol. 3 dated 30 November 2018. The Area Factors were further adjusted to account for Oregon state sales tax and current fuel costs (gasoline and diesel) at the time of estimate preparation, and therefore the equipment rates used in the estimate more accurately represent current 2020 energy prices. 2.3 MATERIAL COSTS Material costs were obtained from vendor quotes or from RS Means CostWorks 2020 using the location factor for Medford, Oregon. 2.4 INDIRECT COSTS Indirect costs are those costs, which cannot be attributed to a single task of construction work. The estimate assumes the work will be performed by the General O&M Contractor. The following General O&M Contractor overhead, profit, and bond

Date Author Note

markups are assumed:

Field Office Overhead (JOOH) = JOOH was calculated based on preparation of submittals and work plans, field staff and staff vehicles, and temporary facilities. Includes 2% small tools markup on labor.
Home Office Overhead (HOOH) = 10% running
Profit = 8% running
G&A = 5% running
Builders Risk Insurance = 0.5% running
General Liability Insurance = 1% running
Bond = Bond was determined using the MII provided tiered Class B bond table.

2.5 PROJECT OWNER (GOVERNMENT) MARKUPS:
The owner (government) also has markups on the project level that are applied after contractor markups. These markups are included below.

2.5.1 OWNER COST - ESCALATION
The escalation rate is based on the composite escalation index obtained from the U.S. Army Corps of Engineers Civil Works Construction Cost Index System (CWCCIS), EM 1110-2-1304, 30 September 2019.

2.5.2 OWNER COST - CONTINGENCY
A contingency 20 percent (%) is used, which includes 10% scope and 10% bid contingencies. The 10% scope contingency was applied to account for the uncertainty in the extent of the O&M needed. The 10% bid contingency reflects the unknown costs associated with implementing the O&M such as adverse weather conditions, materials costs, or unfavorable market conditions.

2.6 DETAIL COST SOURCES:
Direct detail costs were derived using several sources of cost information. Vendor quotes were the primary source of material costs; where vendor quotes were not readily obtained, RS Means CostWorks 2020, a cost database, was used. In some instances, estimator judgment was used in place of vendor quotes or RS Means CostWorks. The following are the reference codes used in the detail section to identify sources and are listed in order of usage within the estimate:

- Vendor quotes or costs based on previous work by CDM Smith (no code listed)
- RS Means CostWorks 2020 “00 00 0000 0000”

ATTACHMENTS:

Attachment A - Calculations
Attachment B - Wage Rate Determination
Attachment C - Equipment Rate Determination

Direct Cost Markups	Category	Method
Reproduction and Shipping	TaxAdj	Running % on Selected Costs
LaborCost		

Contractor Markups	Category	Method
Contractor Labor Overhead	Allowance	Running %
JOOH (Small Tools)	Allowance	% of Labor
JOOH	JOOH	JOOH (Calculated)
HOOH	HOOH	Running %
Profit	Profit	Running %
G&A	MiscContract	Running %
Builders Risk Insurance	MiscContract	Running %
General Liability Insurance	MiscContract	Running %
Bond	Bond	Bond Table
HTRW (Asbestos Only), Banded, 24 months, 1.00% Surcharge		

Contract Price	*Bond Rate*
0	*2.20*
3,000,000	*2.10*
5,000,000	*2.00*
7,500,000	*1.90*

JOOH Sub	JOOH	Running %
HOOH Sub	HOOH	Running %
Profit Sub	Profit	Running %

Description	Quantity	UOM	ProjectCost
Project Cost Summary Report			**240,146**
00 NRE Superfund Site - O&M Costs	**1.00**	**LS**	**240,146**
02 U.S. Environmental Protection Agency	**1.00**	**LS**	**26,148**
02.01 Visual Site Inspections - Five-Year Site Reviews	**1.00**	**LS**	**6,654**
(Note: Includes time to mobilize and demobilize from the site.)			
			1,900.96
USR SW-INSP-VIS Visual Site Inspection	3.00	DAY	5,703
(Note: 2 Person Crew)			
			100.80
USR SW-PD-LDG Per Diem - Lodging	6.00	DAY	605
(Note: 2019-2020 rates from www.gsa.gov. Per Diem - Lodging per person)			
			57.75
USR SW-PD-MIE Per Diem - M&IE	6.00	DAY	347
(Note: 2019-2020 rates from www.gsa.gov. Per Diem - M&IE per person)			
02.02 Five-Year Review Report	**1.00**	**LS**	**19,494**
			257.33
FOP FA-PROJM Project Managers	10.00	HR	2,573
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			
			180.96
HTW HO-STFENG Environmental Engineer	32.00	HR	5,791
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			
			140.49
HTW HO-STFSCI Environmental Scientist	56.00	HR	7,868
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			
			157.47
FOP FC-ENGQC Engineers, Quality Control	6.00	HR	945
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			
			98.81
HTW HO-CADD Drafter CAD	16.00	HR	1,581
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			
			73.64
FOP FB-CLTYP Clerks, Typists, Bookkeepers & Receptionist	10.00	HR	736
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			
03 Oregon Department of Environmental Quality	**1.00**	**LS**	**213,997**
03.01 General Project Management and Coordination	**1.00**	**LS**	**12,821**
(Note: Project management costs including managing budget and schedule, monthly reporting, coordination with ODEQ, tracking storm events, preparatory work and purchasing materials.)			
			175.33
FOP FA-PROJM Project Managers	52.00	HR	9,117
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			
			67.19
FOP FC-FLDER Field Engineers	26.00	HR	1,747
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			

Description	Quantity	UOM	ProjectCost
			50.18
FOP FB-CLTYP Clerks, Typists, Bookkeepers & Receptionist (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	39.00	HR	1,957
03.02 Visual Site Inspections (Note: Annual visual site inspection. Includes time to mobilize and demobilize from the site.)	**1.00**	**LS**	**9,040**
			1,942.78
USR SW-INSP-VIS Visual Site Inspection (Note: 2 Person Crew)	4.00	DAY	7,771
			100.80
USR SW-PD-LDG Per Diem - Lodging (Note: 2019-2020 rates from www.gsa.gov. Per Diem - Lodging per person)	8.00	DAY	806
			57.75
USR SW-PD-MIE Per Diem - M&IE (Note: 2019-2020 rates from www.gsa.gov. Per Diem - M&IE per person)	8.00	DAY	462
			3,275.62
03.03 Inspection Report (Note: Annual site inspection report.)	**1.00**	**EA**	**3,276**
			239.08
FOP FA-PROJM Project Managers (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	2.00	HR	478
			168.13
HTW HO-STFENG Environmental Engineer (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	4.00	HR	673
			130.53
HTW HO-STFSCI Environmental Scientist (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	12.00	HR	1,566
			146.31
FOP FC-ENGQC Engineers, Quality Control (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	1.00	HR	146
			91.81
HTW HO-CADD Drafter CAD (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	3.00	HR	275
			68.42
FOP FB-CLTYP Clerks, Typists, Bookkeepers & Receptionist (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	2.00	HR	137
03.04 Maintenance of Onsite Repositories	**1.00**	**LS**	**23,021**
03.04.01 Minor Protective Cap Maintenance	**1.00**	**LS**	**20,361**
03.04.01.01 Year 1	**1.00**	**LS**	**10,731**
			633.11
USR SW-ONM-CVR-MB Mobilization or Demobilization (Note: Assumes 1 hour one-way travel per mobilization or demobilization.)	2.00	EA	1,266
			70.35

Description	Quantity	UOM	ProjectCost
USR SW-ONM-CVR Cover and Backfill Maintenance	72.00	LCY	5,065
			61.10
USR OM-SOIL Soil with Compost Mix	72.00	LCY	4,399
(Note: Vendor Quote, March 2018. The Rivers Edge Landscape Supply, LLC. 2901 Memorial Drive Klamath Falls, OR 97601 (541) 882-3143. $38/CY + $6.25/CY delivery = $44.25. Cost escalated to 2020 using EM 1110-2-1304 Civil Works Construction Cost Index System (CWCCIS), September 2019 for the composite index.)			
03.04.01.02 Year 2	**1.00**	**LS**	**5,998**
			633.11
USR SW-ONM-CVR-MB Mobilization or Demobilization	2.00	EA	1,266
(Note: Assumes 1 hour one-way travel per mobilization or demobilization.)			
			70.35
USR SW-ONM-CVR Cover and Backfill Maintenance	36.00	LCY	2,532
			61.10
USR OM-SOIL Soil with Compost Mix	36.00	LCY	2,200
(Note: Vendor Quote, March 2018. The Rivers Edge Landscape Supply, LLC. 2901 Memorial Drive Klamath Falls, OR 97601 (541) 882-3143. $38/CY + $6.25/CY delivery = $44.25. Cost escalated to 2020 using EM 1110-2-1304 Civil Works Construction Cost Index System (CWCCIS), September 2019 for the composite index.)			
03.04.01.03 Year 3 Onward	**1.00**	**LS**	**3,632**
			633.11
USR SW-ONM-CVR-MB Mobilization or Demobilization	2.00	EA	1,266
(Note: Assumes 1 hour one-way travel per mobilization or demobilization.)			
			70.35
USR SW-ONM-CVR Cover and Backfill Maintenance	18.00	LCY	1,266
			61.10
USR OM-SOIL Soil with Compost Mix	18.00	LCY	1,100
(Note: Vendor Quote, March 2018. The Rivers Edge Landscape Supply, LLC. 2901 Memorial Drive Klamath Falls, OR 97601 (541) 882-3143. $38/CY + $6.25/CY delivery = $44.25. Cost escalated to 2020 using EM 1110-2-1304 Civil Works Construction Cost Index System (CWCCIS), September 2019 for the composite index.)			
03.04.02 Seeding	**1.00**	**LS**	**2,660**
			384.70
USR EW-SED-NAT-MB Seeding - Native Mix - Mobilization or Demobilization	2.00	EA	769
(Note: Assumes 1 hour one-way travel per mobilization or demobilization.)			
			0.11
USR EW-SED-NAT Seeding - Native Mix	3,490.00	SF	385
(Note: Crew Output - RS Means CostWorks 2014; Source Tag - 32 92 1913 0100)			
			546.66
USR EW-SED-MUL-MB Hydromulching - Mobilization or Demobilization	2.00	EA	1,093
(Note: Assumes 1 hour one-way travel per mobilization or demobilization.)			
			0.04
USR EW-SED-MUL Hydromulching	3,490.00	SF	137
(Note: Crew Output - RS Means CostWorks 2014; Source Tag - 32 92 1914 1000)			
			21.78
USR MT-VEG-NAT Native Seed Mix	2.00	LB	44
(Note: Assumes 20% Idaho fescue, 12% Bluebunch wheatgrass, 8% Bottlebrush squirreltail, 11% Sandberg bluegrass, 12% Blue wildrye, 8% Blue flax, 5% Western yarrow, 12% Low sagebrush, 12% Green rabbitbrush. 2020 seed cost based on 20 lbs/ac.)			

Description	Quantity	UOM	ProjectCost
			0.38
USR MT-VEG-FRT Fertilizer	12.00	LB	5
(Note: Material cost based on CostWorks 2020 - 32 92 1913 0400.)			
			1.42
USR MT-VEG-MUL Mulch	160.00	LB	228
(Note: Based on 50 pound bag, domyown.com, 2020.)			
03.05 Major Breaches of Protective Cap	**1.00**	**LS**	**121,262**
			37.31
03.05.01 Soil, Bulk Delivered	**2,350.00**	**LCY**	**87,675**
			35.21
USR OM-SOIL-BULK Bulk Soil (Screened)	2,350.00	LCY	82,745
(Note: Vendor Quote, March 2018. Rogue Soil. 3650 Alley Lane, Medford, OR 97501. Phone: (541)-512-2909. $12/CY, $405/30CY trucking = $25.5/CY delivered. Cost escalated to 2020 using EM 1110-2-1304 Civil Works Construction Cost Index System (CWCCIS), September 2019 for the composite index.)			
			21.10
USR EW-SOL-AMD Organic Amendment	71.00	TON	1,498
			48.33
USR MT-AMD-OM Organic Material	71.00	TON	3,432
(Note: **Vendor Quote** River Edge, 2014. Cost escalated to 2020 using EM 1110-2-1304 Civil Works Construction Cost Index System (CWCCIS), September 2019 for the composite index.)			
			10.00
03.05.02 Placement and Grading of Soil	**2,350.00**	**LCY**	**23,505**
			527.21
USR MDM-01 Mobilization of Crawler Dozer	2.00	EA	1,054
			354.47
USR MDM-02 Mobilization of Skid Steers	2.00	EA	709
USR MDM-03 Mobilization of Compactor	2.00	LS	1,003
			1.38
USR EW-GRD-RGH-LRG Grading - Rough (Large Open Area)	2,160.00	LCY	2,990
			0.08
USR EW-GRD-FSH Grading - Finish (Large Open Area)	26,140.00	SF	2,192
(Note: Productivity per estimate for non-uniform areas.)			
			70.35
USR SW-ONM-CVR Grading Soil within Drainage Channel	190.00	LCY	13,366
			0.24
USR EW-GRD-FSH-S Grading - Finish (Small Open Area)	8,950.00	SF	2,192
(Note: Grading (Finish) productivity based on CostWorks 2018 - 31 22 1610 0200)			
			0.29
03.05.03 Seeding	**35,090.00**	**SF**	**10,082**
			0.23
03.05.03.01 Seeding	**35,090.00**	**SF**	**7,940**
			384.70
USR EW-SED-NAT-MB Seeding - Native Mix - Mobilization or Demobilization	2.00	EA	769

Description	Quantity	UOM	ProjectCost
(Note: Assumes 1 hour one-way travel per mobilization or demobilization.)			
			0.07
USR EW-SED-NAT Seeding - Native Mix	35,090.00	SF	2,397
(Note: Crew Output - RS Means CostWorks 2014; Source Tag - 32 92 1913 0100)			
			546.66
USR EW-SED-MUL-MB Hydromulching - Mobilization or Demobilization	2.00	EA	1,093
(Note: Assumes 1 hour one-way travel per mobilization or demobilization.)			
			0.03
USR EW-SED-MUL Hydromulching	35,090.00	SF	958
(Note: Crew Output - RS Means CostWorks 2014; Source Tag - 32 92 1914 1000)			
			21.78
USR MT-VEG-NAT Native Seed Mix	17.00	LB	370
(Note: Assumes 20% Idaho fescue, 12% Bluebunch wheatgrass, 8% Bottlebrush squirreltail, 11% Sandberg bluegrass, 12% Blue wildrye, 8% Blue flax, 5% Western yarrow, 12% Low sagebrush, 12% Green rabbitbrush. 2020 seed cost based on 20 lbs/ac.)			
			0.38
USR MT-VEG-FRT Fertilizer	122.00	LB	47
(Note: Material cost based on CostWorks 2020 - 32 92 1913 0400.)			
			1.42
USR MT-VEG-MUL Mulch	1,620.00	LB	2,306
(Note: Based on 50 pound bag, domyown.com, 2020.)			
			0.22
03.05.03.02 Erosion Control Blanket	**9,850.00**	**SF**	**2,142**
			484.24
USR SW-ERO-BLK-MB Erosion Control Blanket Installation - Mobilization or Demobilization	2.00	EA	968
(Note: Assumes 1 hour one-way travel per mobilization or demobilization.)			
			0.09
USR SW-ERO-BLK Erosion Control Blanket Installation	9,850.00	SF	848
(Note: Crew Output - RS Means CostWorks 2018; Source Tag - 31 25 1416 0070)			
			0.03
USR SW-ERO-BLK Erosion Control Blanket	9,850.00	SF	326
(Note: Material cost based on CostWorks 2020 - 31 25 1416 0070.)			
03.06 Sampling - Downgradient of Major Breach	**1.00**	**LS**	**24,495**
03.06.01 SAP/QAPP Development	**1.00**	**LS**	**16,860**
			262.99
FOP FA-PROJM Project Managers	8.00	HR	2,104
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			
			143.59
HTW HO-STFSCI Environmental Scientist	80.00	HR	11,487
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			
			160.94
FOP FC-ENGQC Engineers, Quality Control	10.00	HR	1,609
(Note: Rates are based on Foreign Labor Certification Data Center for the area.)			

Description	Quantity	UOM	ProjectCost
HTW HO-CADD Drafter CAD (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	6.00	HR	*100.99* 606
FOP FB-CLTYP Clerks, Typists, Bookkeepers & Receptionist (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	14.00	HR	*75.26* 1,054
03.06.02 Activity Based Sampling (ABS) (Note: Assume 4 locations for ABS)	**4.00**	**EA**	*1,908.69* **7,635**
USR SW-TST-ABS1 ABS, Sample and Analysis (Note: Per estimator. Based on previous work.)	4.00	EA	*1,294.03* 5,176
USR SW-TST-ABS2 Equipment/ABS Area/ABS Event (Note: Per estimator. Based on previous work.)	4.00	EA	*226.46* 906
USR SW-TST-ABS3 Sampling and Other Supplies/ABS Area/ABS Event (Note: Per estimator. Based on previous work.)	4.00	EA	*388.21* 1,553
03.07 Compensation for Damages (Note: Seek compensation for damages due to negligent activities by property owners or other entity.)	**1.00**	**LS**	**17,075**
USR L-LARE Paralegal (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	80.00	HR	*86.54* 6,923
USR L-ASPRE Environmental Lawyer (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	40.00	HR	*164.66* 6,586
FOP FA-PROJM Project Managers (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	2.00	HR	*262.99* 526
HTW HO-STFENG Environmental Engineer (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	8.00	HR	*184.94* 1,480
HTW HO-CADD Drafter CAD (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	8.00	HR	*100.99* 808
FOP FB-CLTYP Clerks, Typists, Bookkeepers & Receptionist (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	10.00	HR	*75.26* 753
03.08 Monitor Institutional Controls	**1.00**	**LS**	**3,008**
USR L-LARE Paralegal (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	16.00	HR	*78.67* 1,259

Description	Quantity	UOM	ProjectCost
			149.69
USR L-ASPRE Environmental Lawyer (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	4.00	HR	599
			239.08
FOP FA-PROJM Project Managers (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	2.00	HR	478
			168.13
HTW HO-STFENG Environmental Engineer (Note: Rates are based on Foreign Labor Certification Data Center for the area.)	4.00	HR	673

MII Report Backup Information

PROJECT:	North Ridge Estates	COMPUTED BY :	AIS	CHECKED BY:	MS
JOB NO.:	114386 6460.EC1.02B.STUDY	DATE :	2/28/2018	DATE CHECKED:	3/19/2018
CLIENT:	USEPA	UPDATE :	4/2/2020	PAGE NO. :	QTO-01

Description: Quantity (QTO) Development Table.

Assumptions

Soil Swell Factor, BCY to LCY:	1.15	*NRE OU1, RD Cost Estimate 100%, 1/31/2014*
Soil Swell Factor, BCY to ECY:	1.04	
Soil Swell Factor, LCY to ECY:	0.90	
Compost for Soil Amendment, TON/CY:	0.03	*NRE OU1, RD Cost Estimate 100%, 1/31/2014*

U.S. Environmental Protection Agency

Five-Year Review

Visual Site Inspections

Total Number of Parcels, EA:	56	
Assumed Number of Hours per Parcel, HR/EA:	0.5	*Assumed per estimator*
Total Number of Days Required for Inspection, DY:	**3**	
Number of Person per Crew, EA:	2	
Total Number of Days for Per Diem, DY:	**6**	

Five-Year Review Report

Project Manager, HR:	**10**
Environmental Engineer, HR:	**32**
Environmental Scientist, HR:	**56**
Quality Control Engineer, HR:	**6**
CAD Drafter, HR:	**16**
Administrative Clerk, HR:	**10**

Oregon Department of Environmental Quality

General Project Management and Coordination

Calendar days, DY:	365
Estimated total number of months, MO:	12
Estimated duration of construction project, WK:	52
Hours per workday for office staff, HR/DY	8

	HR/WK	***Hours***
Project Manager, HR:	1	**52**
Project Engineer, HR:	0.5	**26**
Office Clerk, HR:	0.8	**39**

Visual Site Inspections - Annual

Mobilization and demobilization, HR:	2	*Assumes 1 hour one-way travel*
Total Number of Parcels, EA:	56	
Assumed Number of Hours per Parcel, HR/EA:	0.5	*Assumed per estimator*
Time Required for Inspection, HR:	30	
Assumed length of field day, HR/DY:	10	
Time Required for Inspection, DY:	3	
Number of Additional Inspection Following a Severe Storm Event, EA/YR:	1	*Assumed per estimator*
Assumed Number of Days for Inspection per Event, DY:	1	
Number of Days for Inspection per Event, DY:	1	
Total Number of Days Required for Inspection, DY:	**4**	
Number of Person per Crew, EA:	2	
Total Number of Days for Per Diem, DY:	**8**	

Description: Quantity (QTO) Development Table.

Annual Inspection Report

Project Manager, HR:	**2**
Environmental Engineer, HR:	**4**
Environmental Scientist, HR:	**12**
Quality Control Engineer, HR:	**1**
CAD Drafter, HR:	**3**
Administrative Clerk, HR:	**2**

Maintenance of Onsite Repositories

Area of Swimming Pool Repository, ACR:	12.0	
Area of Memorial Park Repository, ACR:	4.2	
Total Area of Onsite Repositories, ACR:	16.2	

Minor Maintenance - Annual

Percentage of Area Requiring Soil Cover Restoration, %:	0.50%	*Assumed per estimator*
Area Requiring Soil Cover Restoration, ACR:	0.08	
Area Requiring Soil Cover Restoration, SF:	3,490	
Assumed Depth of Soil Requiring Replacement, FT:	0.5	*6-inches*
Volume of Soil Required, ECY:	65	
Volume of Soil Required, LCY:	72	

Assumed Volume of Soil Required

Year:	Yr 1	Yr 2	Yr 3 Onward	
Percentage (%):	100%	50%	25%	*Assumed per engineer*
Volume (LCY):	**72**	**36**	**18**	

Seeding

Total Surface Area to be Revegetated, SF:	**3,490**	
Total Surface Area to be Revegetated, ACR:	0.08	
Native Seed Mix, LB/ACR:	20	*NRE OU1, RD Cost Estimate 100%, 1/31/2014*
Total Seed Required, LB:	**2**	
Fertilizer Application, LB/ACR:	150	*NRE OU1, RD Cost Estimate 100%, 1/31/2014*
Total Fertilizer Required, LB:	**12**	
Hydromulch, LB/ACR:	2,000	*NRE OU1, RD Cost Estimate 100%, 1/31/2014*
Total Hydromulch Required, LB:	**160**	

Major Breaches of Protective Cap (Assumed 1 per 15 Year)

Protective Cap (Soil Cover)

Total Percentage of Area Requiring Soil Cover Restoration, %:	1.5%	*Assumed per engineer for Steep Slopes*
Percentage of Area Requiring Soil Cover Restoration, %:	1.00%	*For Steep Slopes*
Percentage of Area Requiring Soil Cover Restoration, %:	0.50%	*For Shallow Slopes*
Area of Protective Cap along Steep Slopes, ACR:	36	*South of NR Dr. and along Thicket Ct.*
Area of Protective Cap within Shallow Slopes, ACR:	57	*Within NR Dr. and OF Rd, and East of OF Rd.*
Total Area Requiring Soil Cover Restoration, ACR:	0.6	
Total Area Requiring Soil Cover Restoration, SF:	**26,140**	
Assumed Depth of Soil Requiring Replacement, FT:	2.0	*2-feet, Assumed per engineer*
Volume of Soil Required, ECY:	1,940	
Volume of Soil Required, LCY:	2,160	

Description: Quantity (QTO) Development Table.

Drainage Channel

Length of Drainage Channel, LF:	8,950	*Measured from CAD*
Percentage of Channel Length Requiring Restoration, %:	10%	*Assumed*
Total Length of Channel Requiring Restoration, LF:	895	
Approximate Width of Channel, FT:	10	*Design Sheet G7*
Assumed Depth of Soil Requiring Replacement, FT:	0.5	*6-inches*
Total Area of Drainage Channel, SF:	**8,950**	
Volume of Soil Required, ECY:	170	
Volume of Soil Required, LCY:	**190**	
Total Area of Erosion Control Blanket Required, SF:	**9,850**	*Assume 10% Additional*

Volume of Soil Required

Volume of Soil for Growth Media, ECY:	**2,110**	
Volume of Soil for Growth Media, LCY:	**2,350**	
Weight of Compost required for Soil Amendment, TON:	**71**	

Seeding

Total Surface Area to be Revegetated, SF:	**35,090**	
Total Surface Area to be Revegetated, ACR:	0.81	
Native Seed Mix, LB/ACR:	20	*NRE OU1, RD Cost Estimate 100%, 1/31/2014*
Total Seed Required, LB:	**17**	
Fertilizer Application, LB/ACR:	150	*NRE OU1, RD Cost Estimate 100%, 1/31/2014*
Total Fertilizer Required, LB:	**122**	
Hydromulch, LB/ACR:	2,000	*NRE OU1, RD Cost Estimate 100%, 1/31/2014*
Total Hydromulch Required, LB:	**1,620**	

Sampling - Downgradient of Major Breach

Draft SAP/QAPP

Project Manager, HR:	6
Environmental Scientist, HR:	64
Quality Control Engineer, HR:	8
CAD Drafter, HR:	4
Administrative Clerk, HR:	8

Final SAP/QAPP

Project Manager, HR:	2
Environmental Scientist, HR:	16
Quality Control Engineer, HR:	2
CAD Drafter, HR:	2
Administrative Clerk, HR:	6

Total Number of Hours for SAP/QAPP

Project Manager, HR:	**8**
Environmental Scientist, HR:	**80**
Quality Control Engineer, HR:	**10**
CAD Drafter, HR:	**6**
Administrative Clerk, HR:	**14**

Activity Based Sampling (ABS)

Assumed Number of Locations and Samples for ABS, EA:	**4**

Description: Quantity (QTO) Development Table.

Compensation for Damages

Assumed Number of Hours Required to Pursue Compensation

Paralegal, HR:	**80**
Environmental Lawyer, HR:	**40**
Project Manager, HR:	**2**
Environmental Engineer, HR:	**8**
CAD Drafter, HR:	**8**
Administrative Clerk, HR:	**10**

Monitor Institutional Controls

Paralegal, HR:	**16**
Environmental Lawyer, HR:	**4**
Project Manager, HR:	**2**
Environmental Engineer, HR:	**4**

PROJECT:	North Ridge Estates	COMPUTED BY :	AIS	UPDATED BY:	MS	CHECKED BY:	MS
JOB NO.:	114386 6460.EC1.02B.ENGDS	DATE :	2/27/2018	DATE:	4/2/2020	DATE CHECKED:	2/27/2018
CLIENT:	USEPA					WRKSHT NO. :	EQ-01

Description: Determination of backup for equipment rate updates. Information presented should represent the information that is used to update the project's MII equipment library. Region specific factors and shipping rates can be found in the region specific *Construction Equipment Ownership and Operating Expense Schedule* (EP 1110-1-8 - http://www.nww.usace.army.mil/Missions/CostEngineering.aspx).

Library Detail

Area Location: 08 NORTHWEST
Title: EP16R08
Note: 2016 Region 8 equipment library updated April 2020 with current COM and area specific sales tax, electricity, gas, and diesel fuel costs for Klamath Falls, Oregon.

Factors

	Current	
Sales Tax, %:	**0%**	*State and local sales tax rate - search internet*
Working Hours/Year (WHPY), HR/YR:	**1,480**	*See region specific Construction Equipment Ownership and Operating Expense Schedule (EP 1110-1-8)*
Labor Adjustment Factor:	**1.05**	*See region specific Construction Equipment Ownership and Operating Expense Schedule (EP 1110-1-8)*
COM, %:	**2.125**	*https://www.fiscal.treasury.gov/fsservices/gov/pmt/promptPayment/promptPayment_home.htm*
COM Disc., %:	**25**	*See region specific Construction Equipment Ownership and Operating Expense Schedule (EP 1110-1-8)*

Fuels

	Current	
Electricity, $/KWH:	**$0.0877**	*http://www.eia.gov/electricity/monthly/* *See Table 5.6.A - End-Use Sector, by State - commercial rate*
Gas, $/GAL:	**$2.637**	*http://fuelgaugereport.aaa.com/todays-gas-prices/*
Federal Diesel Tax, $/GAL:	$0.244	
State Diesel Tax, $/GAL:	$0.300	*http://www.api.org/Oil-and-Natural-Gas-Overview/Industry-Economics/Fuel-Taxes*
Diesel (Off-Road), $/GAL:	**$2.254**	*On-Road diesel minus fuel taxes*
Diesel (On-Road), $/GAL:	**$2.798**	*http://fuelgaugereport.aaa.com/todays-gas-prices/*

PROJECT:	North Ridge Estates	COMPUTED BY :	AIS	CHECKED BY:	
JOB NO.:	114386.6460.EC1.02B.STUDY	DATE :	2/28/2018	DATE CHECKED:	
CLIENT:	EPA			WRKSHT NO. :	LB-01

Description: Determination of base wage rates for management and engineering personnel (i.e., project manager, civil engineer, etc.). Wage rates based on Foreign Labor Certification Data Center Online Wage Library (http://www.flcdatacenter.com/) salary estimates for Klamath County, Oregon obtained April 2020. Salary rates were used for hourly labor rate determination for the MII estimate. Payroll taxes and insurance are included in the MII estimate calculations.

Library Detail

Title: KCOR2018 Klamath County, Oregon

Note: Wage rates for home and job office personnel and craft laborers based on April 2020 FLCdatacenter.com and Davis-Bacon Wage Determination for Klamath County, Oregon

Escalation

Previous salary cost index (3Q20):	912.75	Escalation indices (composite index) obtained from the U.S. Army Corps of Engineers Civil Works Construction Cost Index System (CWCCIS), EM 1110-2-1304, 30 September 2019.
Cost estimate prep cost index (3Q20):	912.75	

Hourly Wage Calculations

Number of work hours per year: 2,080 52 weeks x 40 hours per week

	Labor Category	Salary	Hourly	Fringe / G&A	Source
FA-PROJM	Project Managers	$137,800	$66.25	75%	07/2019 - 06/2020 FLC 11-9041.00 Level 3
FB-CLTYP	Clerks, Typists, Bookkeepers & Receptionist	$39,437	$18.96	75%	07/2019 - 06/2020 FLC 43-9061.00 Level 4
FC-ENGQC	Engineers, Quality Control	$84,323	$40.54	75%	07/2019 - 06/2020 FLC 11-3051.01 Level 4
FC-FLDER	Field Engineers	$52,811	$25.39	75%	07/2019 - 06/2020 FLC 17-3022.00 Level 4
HO-CADD	Drafter CAD	$52,915	$25.44	75%	07/2019 - 06/2020 FLC 17-3011.02 Level 2
HO-STFENG	Environmental Engineer	$96,907	$46.59	75%	07/2019 - 06/2020 FLC 17-2081.00 Level 3
HO-STFSCI	Environmental Scientist	$75,234	$36.17	75%	07/2019 - 06/2020 FLC 19-2041.00 Level 4
L-ASPRE	Environmental Lawyer	$86,278	$41.48	75%	07/2019 - 06/2020 FLC 23-1011.00 Level 4
L-LARE	Paralegal	$45,344	$21.80	75%	07/2019 - 06/2020 FLC 23-2011.00 Level 3

	Labor Category	Salary	Hourly	Taxable Fringe	Non-Tax Fringe[1]	Total
FA-PROJM	Project Managers	$137,800	$66.25	$49.69	$0.00	$115.94
FB-CLTYP	Clerks, Typists, Bookkeepers & Receptionist	$39,437	$18.96	$14.22	$0.00	$33.18
FC-ENGQC	Engineers, Quality Control	$84,323	$40.54	$30.41	$0.00	$70.95
FC-FLDER	Field Engineers	$52,811	$25.39	$19.04	$0.00	$44.43
HO-CADD	Drafter CAD	$52,915	$25.44	$19.08	$0.00	$44.52
HO-STFENG	Environmental Engineer	$96,907	$46.59	$34.94	$0.00	$81.53
HO-STFSCI	Environmental Scientist	$75,234	$36.17	$27.13	$0.00	$63.30
L-ASPRE	Environmental Lawyer	$86,278	$41.48	$31.11	$0.00	$72.59
L-LARE	Paralegal	$45,344	$21.80	$16.35	$0.00	$38.15

Notes

1 - Non-taxable fringe is taken out of Taxable Fringe but is set at $0.00 in MII per the U.S. Army Corps of Engineers.

CDM Smith

PROJECT:	North Ridge Estates	COMPUTED BY :	AIS	CHECKED BY:	0
JOB NO.:	114386.6460.EC1.02B.STUDY	DATE :	2/28/2018	DATE CHECKED:	1/0/1900
CLIENT:	EPA			WRKSHT NO. :	LB-02

Description: Determination of base wage rates for general construction personnel (i.e., labor, equipment operators, etc.). Wage rates based on Foreign Labor Certification Data Center Online Wage Library (http://www.flcdatacenter.com/) salary estimates for Klamath County, Oregon obtained April 2020. Fringe rates were assumed. Payroll taxes and insurance are included in the MII estimate calculations.

Escalation

Previous salary cost index (3Q20): 912.75
Cost estimate prep cost index (3Q20): 912.75

Escalation indices (composite index) obtained from the U.S. Army Corps of Engineers Civil Works Construction Cost Index System (CWCCIS), EM 1110-2-1304, 30 September 2019.

Fringe Assumption

Estimated fringe based on percentage of hourly wage: **55%**

Hourly Wage Calculations

Number of work hours per year: 2,080 52 weeks x 40 hours per week

	Labor Category	Salary	Hourly	Fringe	Source
B-LABORER	Laborers, (Semi-Skilled)	$46,758	$22.48	$12.36	07/2019 - 06/2020 FLC 47-2061 Level 4
B-EQOPRCRN	Equip. Operators, Heavy	$55,952	$26.90	$14.80	07/2019 - 06/2020 FLC 47-2073 Level 4
B-EQOPRMED	Equip. Operators, Medium	$51,813	$24.91	$13.70	07/2019 - 06/2020 FLC 47-2073 Level 3
B-EQOPRLT	Equip. Operators, Light	$47,674	$22.92	$12.61	07/2019 - 06/2020 FLC 47-2073 Level 2
B-TRKDVRHV	Truck Drivers, Heavy	$42,744	$20.55	$11.30	07/2019 - 06/2020 FLC 53-3032 Level 4
B-TRKDVRLT	Truck Drivers, Light	$36,525	$17.56	$9.66	07/2019 - 06/2020 FLC 53-3032 Level 2

Labor Category		Hourly	Taxable Fringe	Non-Tax Fringe[1]	Total
B-LABORER	Laborers, (Semi-Skilled)	$22.48	$12.36	$0.00	$34.84
B-EQOPRCRN	Equip. Operators, Heavy	$26.90	$14.80	$0.00	$41.70
B-EQOPRMED	Equip. Operators, Medium	$24.91	$13.70	$0.00	$38.61
B-EQOPRLT	Equip. Operators, Light	$22.92	$12.61	$0.00	$35.53
B-TRKDVRHV	Truck Drivers, Heavy	$20.55	$11.30	$0.00	$31.85
B-TRKDVRLT	Truck Drivers, Light	$17.56	$9.66	$0.00	$27.22

Notes

1 - Non-taxable fringe is taken out of Taxable Fringe but is set at $0.00 in MII per the U.S. Army Corps of Engineers.