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Date: MAR 2 2 2017
Refer To: ADEM-17-0037
LAUR: 17-21252
Locates Action No.: n/a

John Kieling, Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Plugging and Abandonment Summary Report for Wells and Boreholes in Cañada del Buey and Cañon de Valle for Fiscal Year 2016

Dear Mr. Kieling:

Enclosed please find two hard copies with electronic files of Plugging and Abandonment Summary Report for Wells and Boreholes in Cañada del Buey and Cañon de Valle for Fiscal Year 2016. This report summarizes the methods Los Alamos National Laboratory used to plug and abandon 11 wells and boreholes in Cañada del Buey and Cañon de Valle.

If you have any questions, please contact Ted Ball at (505) 665-3996 (tedball@lanl.gov) or Karen Armijo at (505) 665-57314 (karen.armijo@nnsa.doe.gov).

Sincerely,

Bruce Robinson, Program Director
Environmental Remediation Program
Los Alamos National Laboratory

Sincerely,

Karen Armijo, Permitting & Compliance Program Manager
National Nuclear Security Administration
Los Alamos Field Office

BR/PM/TB:sm

Enclosures: Two hard copies with electronic files – Plugging and Abandonment Summary Report for Wells and Boreholes in Cañada del Buey and Cañon de Valle for Fiscal Year 2016 (EP2017-0017)

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LA-UR-17-21252
March 2017
EP2017-0017

Plugging and Abandonment Summary Report for Wells and Boreholes in Cañada del Buey and Cañon de Valle for Fiscal Year 2016

Los Alamos
NATIONAL LABORATORY
EST. 1943

Prepared by the Associate Directorate for Environmental Management

EP2017-0018

Plugging and Abandonment Summary Report for Wells and Boreholes in Mortandad Canyon for Fiscal Year 2016

March 2017

Responsible project manager:

Printed Name	Signature	Title	Organization	Date
Ted Ball	Ted Ball	Project Manager	Environmental Remediation Program	3/13/17

Responsible LANS representative:

Printed Name	Signature	Title	Organization	Date
for Randall Erickson		Associate Director	Associate Directorate for Environmental Management	3/13/17

Responsible DOE representative:

Printed Name	Signature	Title	Organization	Date
Karen Armijo		Permitting and Compliance Program Manager	DOE-NA-LA	3/15/17

EXECUTIVE SUMMARY

This report details the methods and procedures Yellow Jacket Drilling Services, LLC (YJD) implemented for Los Alamos National Laboratory (LANL or the Laboratory) to plug and abandon 10 wells in Cañada del Buey: CDBO-1, CDBO-2, CDBO-3, CDBO-4, CDBO-5, CDBO-7, CDBO-8, CDBO-9, CDBM-1, and CDBM-2; and one well in Cañon de Valle, 16-P-01. The 11 wells were plugged and abandoned in accordance with direction from New Mexico Environment Department, the Laboratory's work plans to plug and abandon wells and boreholes, and YJD's field implementation plan for plugging and abandoning wells and boreholes in Mortandad Canyon, dated April 2016, that was also the basis for the activities conducted in Cañada del Buey and Cañon de Valle.

Plugging and abandonment activities occurred from September 12 to September 22, 2016. Before abandonment, water level and total depth of the well measurements were verified using a downhole measuring line, water-level meter, and/or Laboratory video equipment. Where present, belowground appurtenances were removed by YJD or Laboratory personnel. No water was present in any of the wells at the time of abandonment; therefore, purging and sampling before abandonment activities were not required.

Eight wells—CDBO-3, CDBO-4, CDBO-5, CDBO-7, CDBO-8, CDBO-9, CDBM-1, and CDBM-2—were plugged and abandoned using a CME-85 HD hollow-stem auger (HSA) truck-mounted drill rig. Because of access constraints and lack of space at well locations, wells CDBO-1 and CDBO-2 were plugged and abandoned using a limited access Pulstar L-12-T track-mounted HSA drill rig. The upper 20 ft of polyvinyl chloride pipe of each well was overdrilled and removed, after which Portland Type I/II neat cement grout was used to plug and abandon the wells to full depth. All well monuments and surface completions were removed in full. Well 16-P-1 was located in an area inaccessible to any rig and was therefore abandoned by hand. It was the only well not to be overdrilled, given the access constraints.

All wells were cement-grouted to approximately 1 ft below ground surface, and a small concrete surface plug was installed near ground surface. An aluminum survey marker was emplaced in the surface plug. After surface completion each well was surveyed.

Waste accumulated during P&A activities was staged on-site and characterized according to the waste characterization strategy form. Upon receipt of analytical results, all waste will be disposed of per federal and state requirements.

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1.0 INTRODUCTION

This report summarizes field activities associated with the plugging and abandonment (P&A) of 11 wells located in Cañada del Buey and Cañon de Valle, Los Alamos National Laboratory (LANL or the Laboratory), Los Alamos County, New Mexico (Figure 1.0-1). The wells included in this work were CDBO-1, CDBO-2, CDBO-3, CDBO-4, CDBO-5, CDBO-7, CDBO-8, CDBO-9, CDBM-1, and CDBM-2 in Cañada del Buey and one well, 16-P-01, in Cañon de Valle.

2.0 BACKGROUND SUMMARY

Yellow Jacket Drilling Services, LLC (YJD) was contracted by Los Alamos National Security, LLC (LANS) Associate Directorate for Environmental Management (ADEM) to plug and abandon the 11 wells located within Cañada del Buey and Cañon de Valle at the Laboratory. The objective was to plug and abandon the wells to prevent the migration of surface water and potential contaminants within the wells.

The wells located in Cañada del Buey (Figure 2.0-1), designated CDBO-1, CDBO-2, CDBO-3, CDBO-4, CDBO-5, CDBO-7, CDBO-8, CDBO-9, CDBM-1, and CDBM-2, were constructed of 2-in. and 4-in. Schedule 40 polyvinyl chloride (PVC) casing up to depths of up to 192 ft below ground surface (bgs). Well 16-P-1 in Cañon de Valle (Figure 2.0-2) was constructed of 2-in. Schedule 40 PVC to a depth of 34.9 ft bgs. This work was performed under the statement of work (SOW) provided by proposal number 1578464, dated February 26, 2016, and the New Mexico Environment Department– (NMED-) approved “Three Additional Work Plans for the Plugging and Abandonment of Wells and Boreholes for Fiscal Year 2016” (LANL 2016, 601608; NMED 2016, 601652). A complete list of well construction details is provided in Table 2.0-1.

In general, the 11 wells were decommissioned according to the following process: all pumps and downhole equipment were removed; wells were video logged as required; it was confirmed no water was present in the wells. Any aboveground well features were removed as required, and the wells were grouted in place by tremie pumping materials, followed by overdrilling of the upper 20 ft of PVC well casing and cementing in the upper 20 ft of borehole. Well 16-P-1 was the only well not to be overdrilled because of access constraints. Upon completion of all decommissioning activities, a monument was emplaced and surveyed.

YJD provided the means and oversight for the investigation-derived waste (IDW) containment, on-site management, and sampling. All State of New Mexico Office of the State Engineer (NMOSE) P&A documentation was submitted to LANS/DOE and the NMOSE as required (Appendix A).

As stated in the approved 2016 work plans (LANL 2016, 601608; NMED 2016, 601652), the purpose of this report is to summarize the activities required to complete the scope of work that established the provision for the technical functions and expertise required to plug and abandon the wells. These services were performed in accordance with the NMOSE.

3.0 PREABANDONMENT ACTIVITIES

The following activities were conducted before well P&A activities were undertaken. All work was performed in accordance with the April 2016 field implementation plan (FIP) for well servicing, including pump removal, video logging, and well P&A (Yellow Jacket Drilling 2016, 601273).

3.1 Removal of Appurtenances

Utilizing a CME-85 HD and Pulsar L-12-T, YJD was tasked to remove all above- and belowground appurtenances, including pumps, transducers, data loggers, and control panels, if they were present. No wells were found to have belowground appurtenances, so none were removed by YJD. The Laboratory removed a transducer from Well CDBO-5. The aboveground concrete well pads were removed by breaking them into chunks small enough to place in waste accumulation areas. No appurtenances were removed by YJD because no wells had any belowground equipment. The aboveground concrete well pads were removed by jackhammering the concrete into small-enough pieces that could be picked up and placed in waste accumulation areas.

3.2 Downhole Video, Water Level, and Total Depth Measurements

Laboratory personnel video logged all 11 wells, with the exception of P-16-1, to document downhole conditions. Water level and total depth measurements were collected before each well or borehole was plugged and abandoned. No groundwater was present in the wells at the time of abandonment, except at CDBO-7.

All abandonment activities were conducted from September 12 to September 20, 2016. Upon completion of preabandonment activities, YJD demobilized the Pulstar L-12-T pump rig and crew from the site. A complete list of findings and well descriptions is provided in Table 3.2-1.

4.0 WELL AND BOREHOLE ABANDONMENT

Upon completion of all preabandonment activities, the 11 wells were plugged and abandoned in accordance with the approved April 2016 FIP (Yellow Jacket Drilling 2016, 602067). In addition, all work followed the approved 2016 work plans (LANL 2016, 601608; NMED 2016, 601652) as a guide for field operations to ensure all objectives were met. This process included tremie pumping materials from the bottom of the well up to the surface to ensure displacement of any water and provide a complete seal without any voids. After the well had been grouted in place, overdrilling of the upper 20 ft of PVC casing was performed (except at well 16-P-1), after which a cement seal was placed within the overdrilled borehole to seal the abandoned well. Eight wells were plugged and abandoned using a truck-mounted HSA rig. Two wells were plugged and abandoned with a limited access track-mounted HSA drill rig. The final well was plugged and abandoned by hand-carrying all supplies to the well location.

The P&A procedures utilized were in compliance with NMOSE well or borehole abandonment regulations. Additionally, the P&A procedures used comply with 19.27.4 New Mexico Administrative Code, Rules and Regulations Governing Well Driller Licensing; Construction, Repair and Plugging of Wells.

A well plugging plan of operations was initially submitted and approved by the NMOSE for each well and borehole before P&A.

Waste accumulated during these activities was staged on-site and characterized as determined by the waste characterization strategy form (WCSF) for handling and disposal.

4.1 Cañada del Buey Wells: CDBO-3, CDBO-4, CDBO-5, CDBO-7, CDBO-8, CDBO-9, CDBM-1, and CDBM-2

4.1.1 Well Construction

Wells CDBO-3, CDBO-4, CDBO-5, CDBO-7, CDBO-8, CDBO-9, CDBM-1, and CDBM-2 were located in Cañada del Buey in Technical Area 54 (TA-54) and were abandoned utilizing a CME 85 truck-mounted

drill rig. Well construction information (total depth, well diameter, screen interval) is presented in Table 2.0-1. Well CDBO-3 was drilled to a depth of 13 ft bgs and constructed of 4-in. PVC well casing with a screen interval of approximately 3–12.5 ft bgs with no sump below the screened interval. Well CDBO-4 was drilled to a depth of 12 ft bgs, constructed of 2-in. PVC well casing with a screen interval of approximately 4–12 ft bgs with no sump below the screened interval. Well CDBO-5 was drilled to a depth of 18 ft bgs, constructed of 2-in. PVC well casing with a screen interval of approximately 8–18 ft bgs with no sump below the screened interval. Well CDBO-7 was drilled to a depth of 45 ft bgs, constructed of 2-in. PVC well casing with a screen interval of approximately 31–41 ft bgs and a 4.3-ft sump below the screened interval. Well CDBO-8 was drilled to a depth of 25 ft bgs, constructed of 2-in. PVC well casing with a screen interval of approximately 9–19 ft bgs and a 4.3 ft sump below the screened interval. Well CDBO-9 was drilled to a depth of 32 ft bgs, constructed of 2-in. PVC well casing with a screen interval of approximately 17–27 ft bgs and a 5.4 ft sump below the screened interval. Well CDBM-1 was drilled to a depth of at least 189 ft. The well video could not proceed past the 72 ft bgs interval; however, the well was measured to a depth of 192.7 ft bgs in June 2016. Well CDBM-1 was constructed of 2-in. stainless-steel well casing (no additional information was provided). Well CDBM-2 was drilled to a depth of 100 ft bgs, constructed of 2-in. stainless-steel well casing with no screened interval (cased to full depth). A generic well-construction diagram for the wells is provided in Figure 4.1-1.

4.1.2 Plugging and Abandonment

Before P&A activities were conducted, all wells were video logged, and water levels and total depths were measured and recorded. Wells CDBO-3, CDBO-4, CDBO-5, CDBO-8 CDBO-9, CDBM-1, and CDBM-2 were all dry. At well CDBO-7, water was present when it was originally logged in June 2016 but was found to be dry at the time it was abandoned in 2016. Therefore, none of the wells required purging and sampling.

A truck-mounted CME-85 HSA drill rig was used to install 1-in.–inside diameter (I.D.) PVC tremie casing to approximately full depth of each well, after which each well was pressure grouted with cement grout from total depth to ground surface. Subsequently, all wells were overdrilled with 4.25-in.-I.D./8-in.-outside diameter (.O.D) HSAs to 20 ft bgs and then grouted from 20 ft bgs to surface with approximately 100 gal. of cement grout. Following abandonment, the top 1 ft of borehole was plugged with neat cement grout, and an aluminum survey marker was embedded in the concrete and labeled accordingly.

P&A activities for wells CDBO-3, CDBO-4, CDBO-5, CDBO-7, CDBO-8, CDBO-9, CDBM-1, and CDBM-2 occurred from September 12 to September 16, 2016.

4.2 Cañada del Buey Wells: CDBO-1, CDBO-2

4.2.1 Well Construction

Wells CDBO-1 and CDBO-2 were abandoned using a limited-access track-mounted drill rig and were located in Cañada del Buey at TA-35. CDBO-1 was drilled to 14 ft bgs depth and constructed of 4-in. PVC well casing with a screen interval of approximately 9–14 ft bgs with no sump below the screened interval. CDBO-2 was drilled to 19 ft bgs in depth and constructed of 4-in. PVC well casing with a screen interval of approximately 10–18 ft bgs with no sump below the screened interval. A generic well construction diagram for the wells is provided in Figure 4.1-1.

4.2.2 Plugging and Abandonment

Before P&A activities were performed, both wells were video logged and water levels and total depths were measured and recorded. Wells CDBO-1 and CDBO-2 were found to be dry.

A limited-access track-mounted HSA rig was used to install 1-in.-I.D. PVC tremie pipe inside each well to total depth. Each well was then pressure grouted with cement grout through the PVC tremie pipe from total depth to approximately ground surface. Each well was then overdrilled with 4.25-in.-I.D./8-in.-O.D. HSAs to 20 ft bgs, after which the borehole was sealed with approximately 100 gal. of cement grout pumped through 1-in. PVC tremie pipe from total depth upward to 1 ft bgs as the augers were removed. Following abandonment, the top 1 ft of each borehole was plugged with neat cement, and an aluminum survey marker was embedded in the concrete and labeled accordingly.

P&A activities for wells CDBO-1 and CDBO-2 occurred from September 18 to September 19, 2016.

4.3 Cañon de Valle Well: 16-P-1

4.3.1 Well Construction

Well 16-P-1 was located in Cañon de Valle in TA-16 (Figure 2.0-2). Well 16-P-1 was not video logged before it was abandoned because of its location and difficulty of access. It was measured before abandonment at approximately 35 ft bgs in depth. Well 16-P-1 was constructed of 2-in. PVC well casing with an unknown screen interval or sump depth below the screened interval. A generic well construction diagram for the well is provided in Figure 4.1-1.

4.3.2 Plugging and Abandonment

Because of its remote location and access constraints, well 16-P-1 could not be video logged. As such, total depth was measured, but screen intervals could not be recorded. Well 16-P-1 was found to be dry at time of abandonment. Given its remote location and access constraints, neither a typical truck-mounted HSA rig nor limited-access track-mounted equipment could access the well location. YJD's field crew hand-carried all materials and equipment to the well for abandonment; therefore, this well was not overdrilled to 20 ft bgs. YJD hand-lowered to install 1-in.-I.D. PVC tremie pipe in the well to total depth. The well was then pressure grouted with cement grout through the PVC tremie pipe from total depth to approximately ground surface. The borehole was sealed with approximately 10 gal. of cement grout poured through 1-in. PVC tremie pipe from total depth upward to 1 ft bgs as the tremie pipe was removed. Following abandonment, the top 1 ft of the borehole was plugged with neat cement and an aluminum survey marker was embedded.

P&A activities for well 16-P-1 occurred on September 19, 2016.

5.0 SURFACE COMPLETIONS

During well abandonment activities, well monuments and surface completions were removed in full. Wells were grouted to full depth, the upper 20 ft was overdrilled (with the exception of 16-P-1), and then grouted with cement grout to 1 ft bgs. Subsequently, the top 1 ft of each location was filled with Portland Type I/II neat cement and mounded above existing grade with an aluminum survey marker embedded in the concrete plug. All surface completion materials were segregated into three piles based on composition: metals, concrete, or plastics. All completion debris was then staged on Visqueen sheeting at each well location for analysis and disposal.

6.0 WATER SAMPLING

Before P&A activities were undertaken, all wells, except CDBO-7, were surveyed by Laboratory personnel and found to be dry. Well CDBO-7 exhibited water at 37.6 ft bgs during the initial well logging in June 2016. However, during field activities for abandonment in September 2016, well CDBO-7 was tagged and found dry. Therefore, sample collection and analysis were not required or performed.

7.0 WASTE MANAGEMENT

After well abandonment activities were completed, generated waste was sampled in accordance with the project WCSF. At all well and borehole locations, samples were collected and submitted to the Sample Management Office (SMO) for analysis. All samples were collected and submitted to the SMO from September 13 to September 20, 2016.

Waste generated from the P&A project included drill cuttings, fluids, and typical construction waste such as soil, water, paper, metal, concrete, and plastics. Completion debris generated were either containerized in 55-gal. U.S. Department of Transportation–approved steel drums or segregated into three piles based on composition: metals, concrete, or plastics. All soils and fluids generated were placed into drums. All other materials were staged at each well location on bermed Visqueen. YJD provided sampling and transportation of samples to the SMO for analysis. All staged materials left at well sites were tested or sampled by Laboratory personnel for disposal. Upon completion of analytical testing, YJD will categorize the materials to be disposed.

Waste accumulated during P&A activities was staged on-site and characterized as determined by the waste in accordance with the WCSF (LANL 2016, 601608) and EP-DIR-SOP-10012, “Characterization of Environmental Programs Waste” for handling and disposal.

8.0 GEODETIC SURVEY

Geodetic surveys were conducted on the surface completions with a Trimble R10 global navigation satellite system global positioning system. All coordinates are expressed relative to the New Mexico State Plane Coordinate System Central Zone (North American Datum [NAD] 83); elevation is expressed relative to feet above mean sea level using the National Geodetic Vertical Datum of 1929. The survey point was the aluminum survey marker placed in the concrete plug and labeled with well identification and information. Surveying was conducted on September 17, 2016. A complete list of all survey coordinates is presented in Table 8.0-1.

9.0 DEVIATIONS FROM PLANNED ACTIVITIES

No deviations were required to complete this phase of work.

10.0 SUMMARY

All abandonment activities were conducted from September 12 to September 22, 2016. All sampling activities occurred from September 13 to September 20, 2016. All project activities were performed per the SOW Exhibit D, and the approved work plans (LANL 2016, 601608; NMED 2016, 601652). All above- and belowground appurtenances were removed. Eight wells were abandoned with a CME-85 HT truck-mounted auger rig, two were abandoned with a Pulstar L-12-T limited-access track-mounted auger rig, and the final well was abandoned by hand-carrying all supplies to the well because no drill rigs could access the well location. All wells were plugged with Portland Type I/II cement grout via tremie tubing, overdrilled to 20 ft bgs (with the exception of well 16-P-1), the top 1 ft of each borehole was plugged with neat cement, and all surface completions were removed. Concrete surface plugs were emplaced with aluminum pins and surveyed. All waste generated was staged accordingly, sampled, and characterized. Upon receipt of analytical results, the Laboratory will be responsible for removing and disposing of all waste generated.

11.0 REFERENCES

The following list includes all documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ER ID or ESH ID. This information is also included in text citations. ER IDs were assigned by the Environmental Programs Directorate's Records Processing Facility (IDs through 599999), and ESH IDs are assigned by the Environment, Safety, and Health (ESH) Directorate (IDs 600000 and above). IDs are used to locate documents in the Laboratory's Electronic Document Management System and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the ESH Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), June 2016. "Three Additional Work Plans for the Plugging and Abandonment of Wells and Boreholes for Fiscal Year 2016," Los Alamos National Laboratory document LA-UR-16-24186, Los Alamos, New Mexico. (LANL 2016, 601608)

NMED (New Mexico Environment Department), July 20, 2016. "Approval, Three Additional Work Plans for the Plugging and Abandonment of Wells and Boreholes for Fiscal Year 2016," New Mexico Environment Department letter to D. Hintze (DOE-EM-LA) and M. Brandt (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2016, 601652)

Yellow Jacket Drilling, March 3, 2016. "IWD [Integrated Work Document] for Drilling and Installation of LANL Vertical Chromium Injection Wells," Los Alamos, New Mexico. (Yellow Jacket Drilling 2016, 601273)

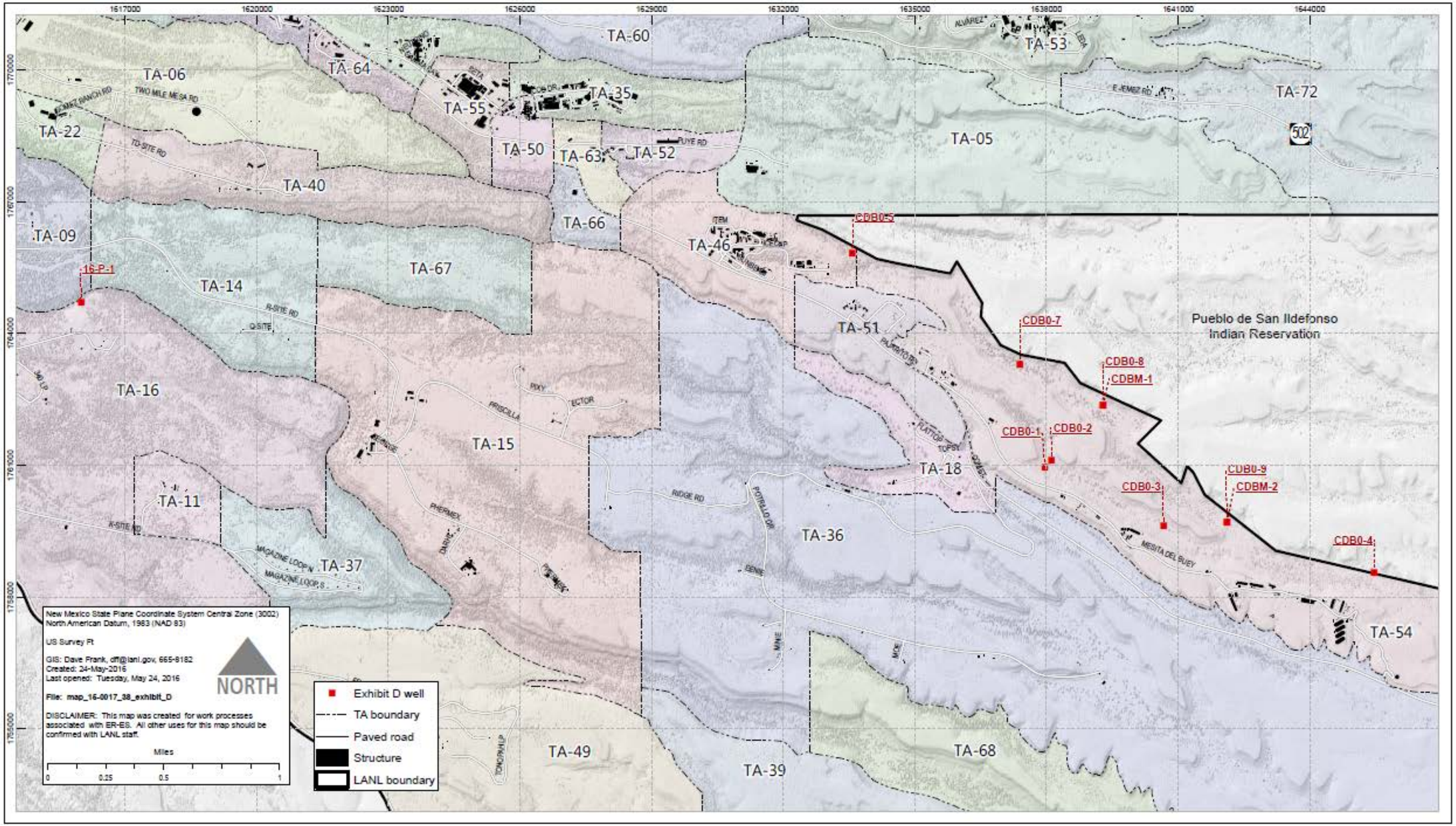

Figure 1.0-1 Site map with well locations

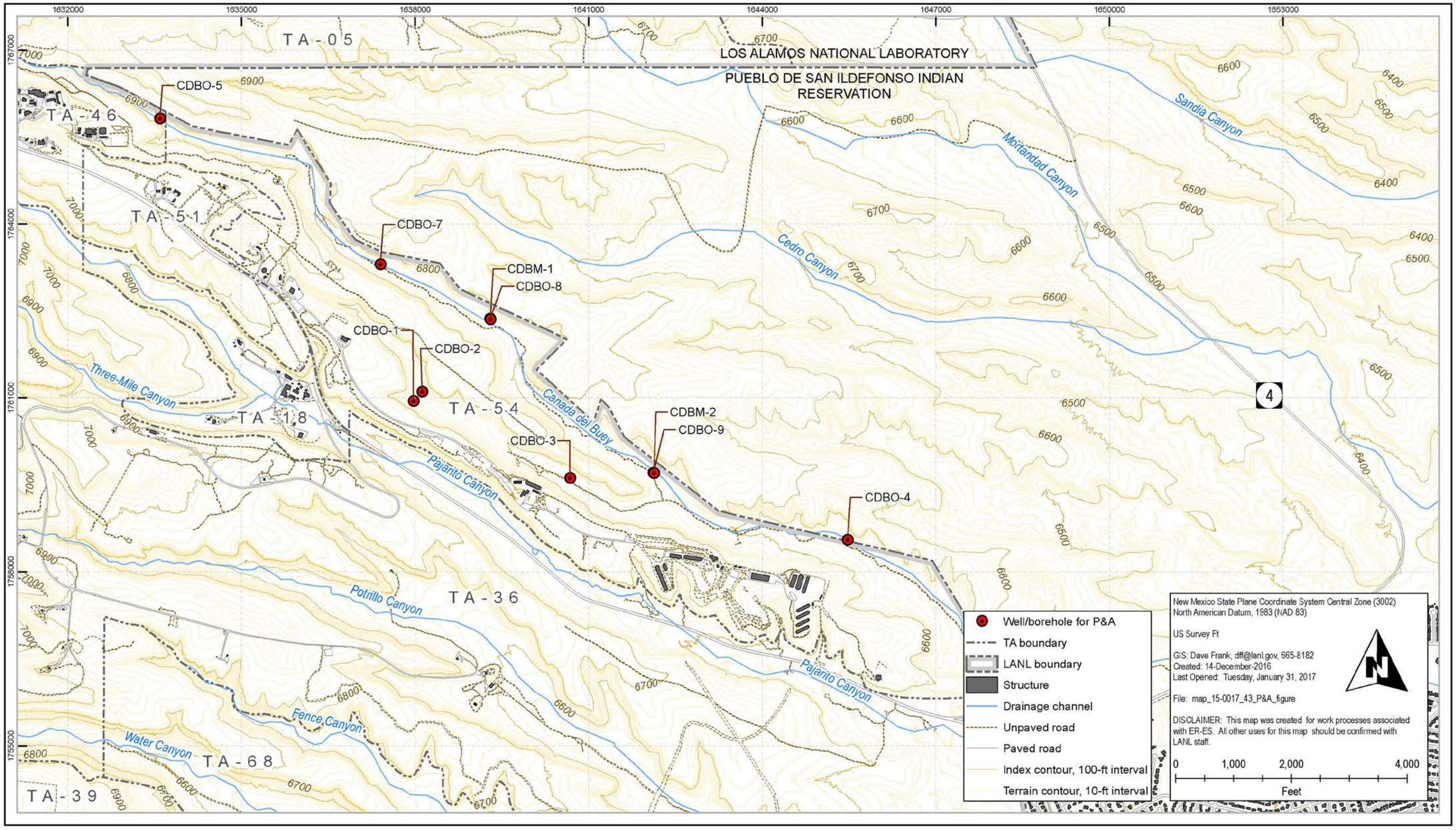

Figure 2.0-1 Location map of Cañada del Buey wells

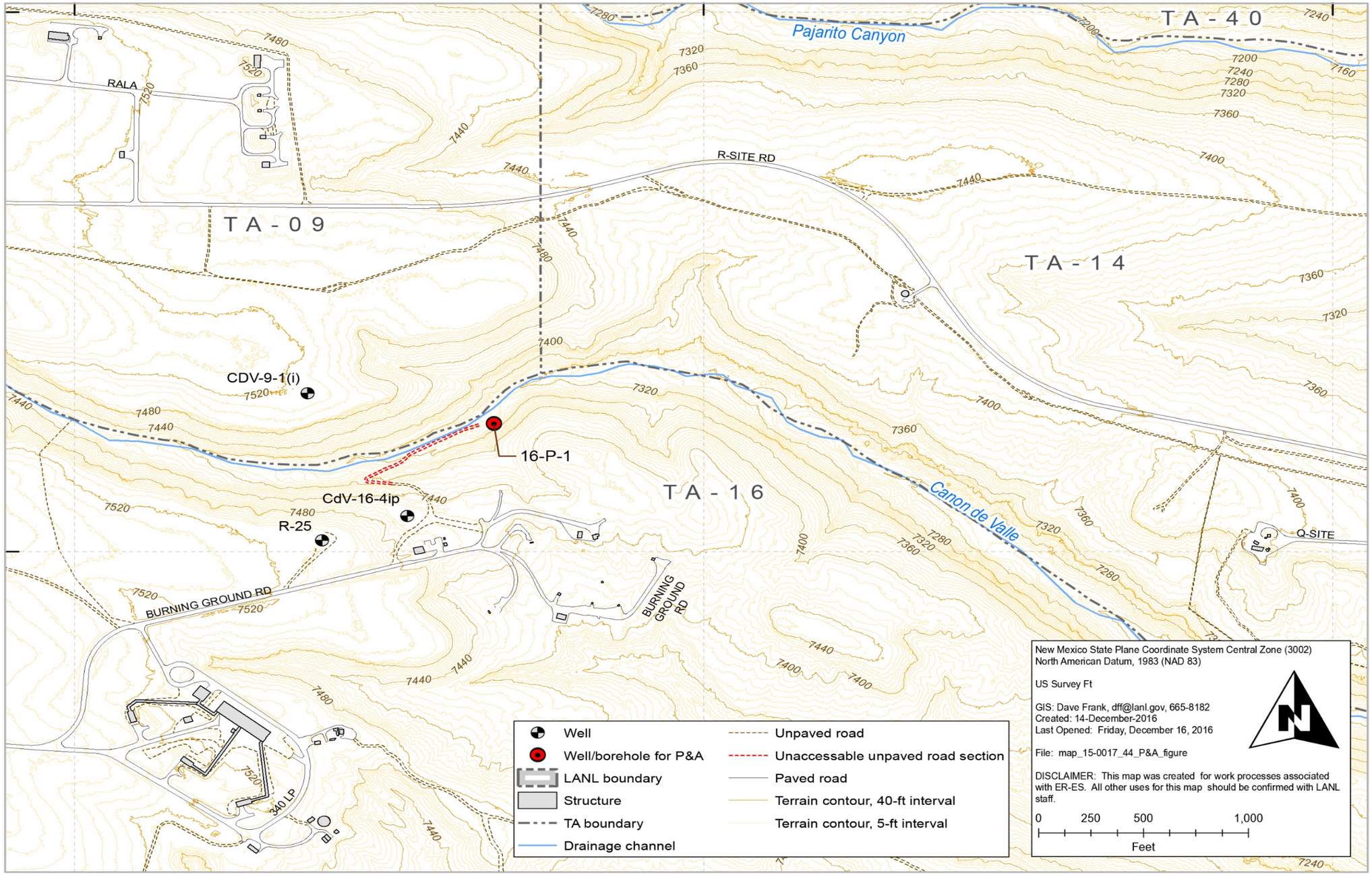

Figure 2.0-2 Location map of Cañon de Valle well

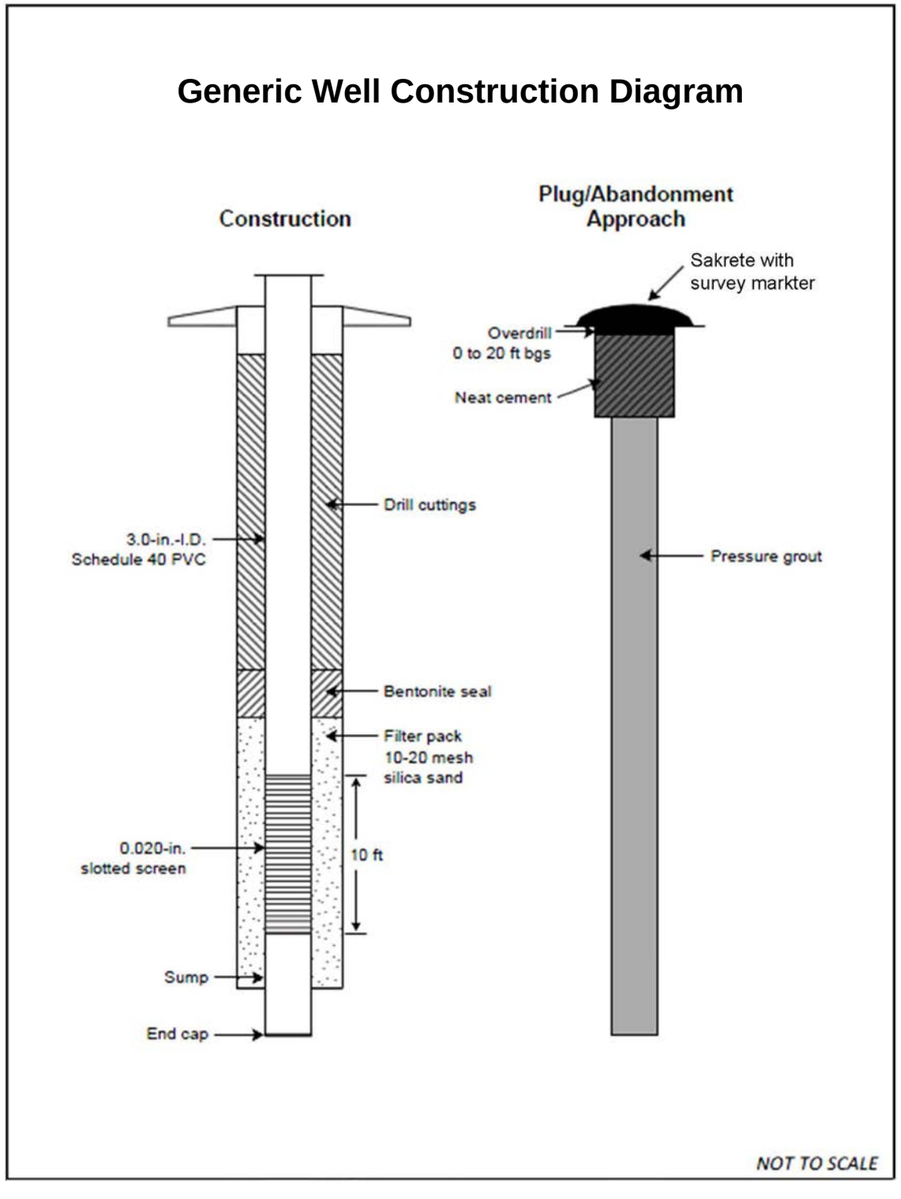

Figure 4.1-1 Generic well construction diagram

Table 2.0-1
Cañada del Buey and Cañon de Valle Wells for 2016 P&A

Well Name	Total Depth (ft)	Diameter (in.)	Number of Screens	Screened Interval (ft)	Screen Length (ft)	Construction Material	Depth to Water	Installation Date	Easting	Northing	Elevation
CDB0-1	14	4	1	9–14	4.5	PVC	Dry	1985	1637969	1760944	6757.6
CDB0-2	19	4	1	10–18	8	PVC	Dry	1985	1638119	1761103	6748.2
CDB0-3	13	4	1	3–12.5	9.5	PVC	Dry	1985	1640677	1759611	6670.2
CDB0-4	12	2	1	4–12	4	PVC	Dry	1985	1645475	1758547	6564.5
CDB0-5	18	2	1	8–18	10	PVC	Dry	1992	1633583	1765818	6879.0
CDB0-7	45	2	1	31–41	10	PVC	1–2 ft water	1992	1637400	1763301	6771.8
CDB0-8	25	2	1	9–19	10	PVC	Dry	1992	1639294	1762366	6722.5
CDB0-9	32	2	1	17–27	10	PVC	Dry	1992	1642119	1759703	6633.0
CDBM-1	193	2	na	na	na	Metal	Moisture monitoring	1992	1639296	1762355	6721.6
CDBM-2	100	2	na	na	na	Metal	Moisture monitoring	1992	1642126	1759697	6634.1
16-P-1	35	2	na	na	na	PVC	Dry	1985	1616000	1764707	7344.0

*na = Not available

Table 3.2-1
Cañada del Buey P&A Video Survey Summary

Well ID	Lock	Well Casing Diameter (in.)	Pump Removed	Video Logged	Protective Casing Stickup (ft)	Well Casing Stickup (ft)	Total Depth (ft)	Screen Interval (ft)	Sump (ft)	Static Water Level (ft)	Comments
CDBO-1	No lock	4	n/a[a]	6/30/2016	1.1	0.75	14	9–14	None	Dry	Screen is ¼-in. hand-drilled holes with wire mesh outside
CDBO-2	No lock	4	n/a	6/30/2016	1.25	0.9	19	10–18	None	Dry	Screen is ¼-in. hand-drilled holes with wire mesh outside
CDBO-3	No lock	4	n/a	6/30/2016	1.2	0.8	13	3–12.5	None	Dry	Screen is ¼-in. hand-drilled holes with wire mesh outside
CDBO-4	No lock	4	n/a	6/29/2016	1.25	0.9	12	4–12	None	Dry	Rocks in bottom of well; screen hand-drilled with ¼-in. holes
CDBO-5	ESH 403 Removed	2	n/a	6/29/2016	3.2	2.25	18	8–18	None	Dry	Factory-slotted screens
CDBO-7	ESH 403 Removed	2	n/a	6/29/2016	2.0	0.4	45	31–41	4.3	37.6	Groundwater; factory-slotted screens
CDBO-8	No lock	2	n/a	6/29/2016	1.8	1.25	25	9–19	5.4	Dry	Factory-slotted screens
CDBO-9	No lock	2	n/a	6/29/2016	2.3	2.25	32	17–27	5.4	Dry	Factory-slotted screens
CDBM-1	No lock	2 SS	n/a	6/29/2016	1.5	0.9	72+	na[b]	na	na	Could not get camera past joint at 71.7 ft; not obstructed. Tagged total depth on 6/30 at 192.7 ft below top of stainless-steel casing.
CDBM-2	No lock	2 SS	n/a	6/29/2016	2.1	1.3	100.0	None	na	na	Cased to depth.

Notes: Datum for all depth measurements is from the top of the concrete well pad or ground surface unless noted otherwise. All locks have been removed and protective casings flagged. One transducer was removed from CDBO-5. No dedicated sample pumps were found to be installed.

[a] n/a = Not applicable.

[b] na = Not available

Table 8.0-1
Geodesic Coordinates List

Sample ID	Northing (U.S. survey foot)	Easting (U.S. survey foot)	Elevation (U.S. survey foot)
CDBO-1	1760943.912	1637968.571	6762.0
CDBO-2	1761103.146	1638118.996	6749.8
CDBO-3	1759610.994	1640677.081	6664.3
CDBO-4	1758546.858	1645467.392	6564.6
CDBO-5	1765818.369	1633583.384	6932.0
CDBO-7	1763301.016	1637400.015	6752.3
CDBO-8	1762366.028	1639294.019	6711.7
CBDO-9	1759702.849	1642119.111	6636.3
CDBM-1	1762355.007	1639295.995	6711.4
CDBM-2	1759696.985	1642126.027	6636.2
16-P-1	1764706.951	1616000.039	7358.0