INL/EXT-14-31989

2013 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory (Revision 22)

June 2014

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Idaho National Laboratory
Idaho Falls, Idaho 83415

http://www.inl.gov

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U.S. Department of Energy
Office of Nuclear Energy
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ABSTRACT

This *2013 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory (Revision 22)* provides water use information for production and potable water wells at the Idaho National Laboratory for Calendar Year 2013. It also provides detailed information for new, modified, and decommissioned wells and holes. Two new wells were drilled and completed in Calendar Year 2013. No modifications were performed on any wells. Seven wells were decommissioned in Calendar Year 2013. Detailed construction information for the new and decommissioned wells is provided. Location maps are included, provided survey information was available.

This report is being submitted in accordance with the Water Rights Agreement between the State of Idaho and the United States, for the United States Department of Energy (dated 1990) and the subsequent Partial Decree for Water Right 34-10901 issued June 20, 2003.

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ACRONYMS

ATR Complex	Advanced Test Reactor Complex
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CITRC	Critical Infrastructure Test Range Complex
CWI	Comprehensive Well Inventory
CY	calendar year
IDWR	Idaho Department of Water Resources
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
MFC	Materials and Fuels Complex
NRF	Naval Reactors Facility
RWMC	Radioactive Waste Management Complex
SS	stainless steel
TAN	Test Area North
USGS	United States Geological Survey

2013 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory (Revision 22)

1. INTRODUCTION

This *2013 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory, (Revision 22)* is being submitted in accordance with the *Water Rights Agreement between the State of Idaho and the United States, for the United States Department of Energy* (Department of Justice 1990) and the subsequent Partial Decree for Water Right 34-10901 (District Court 2003) issued June 20, 2003. As previously agreed (Street 2001), the annual Water Use Report and Comprehensive Well Inventory (CWI) are being combined and submitted as one report.

The Idaho National Laboratory (INL) Site water use reported is for Calendar Year (CY) 2013. Section 2 provides the annual volume of water diverted, maximum and average diversion rates, and "available" pumping levels (water depth) as required by Section 6.2.3 of the Water Rights Agreement for production and potable water wells at the INL Site. Section 2.1 provides total monthly volume, average monthly volume, total annual volume diverted, and water depths (as available) for each production or potable water well. Section 2.2 provides the total monthly volume of water diverted for each facility and the total annual volume for all INL Site production or potable water wells. Section 2.3 provides a summary of the annual water usage, including the total volume of water diverted, maximum diversion rate, and average monthly volume of water diverted for all production and potable wells.

Section 3 is the CWI for the INL Site as required by Section 6.2.2 of the Water Rights Agreement. Section 3.1 provides information for new and modified wells, and Section 3.2 provides information for decommissioned wells and boreholes. Two new wells were drilled and completed in CY 2013. No modifications were performed on wells in CY 2013. Seven wells were decommissioned during CY 2013.

Appendix A provides location maps and diagrams containing detailed construction information for the newly constructed wells. Appendix B provides location maps and diagrams containing detailed construction information for decommissioned wells.

2. 2013 WATER USE INFORMATION FOR THE IDAHO NATIONAL LABORATORY

2.1 Water Volume for Individual Idaho National Laboratory Production or Potable Water Wells

Eight major facilities are located at the INL Site:

- Advanced Test Reactor Complex (ATR Complex)
- Central Facilities Area (CFA)
- Critical Infrastructure Test Range Complex (CITRC)
- Idaho Nuclear Technology and Engineering Center (INTEC)
- Materials and Fuels Complex (MFC)
- Naval Reactors Facility (NRF)
- Radioactive Waste Management Complex (RWMC)
- Test Area North (TAN).

Each major facility is serviced by one or more production and/or potable water wells. Tables 1 through 8 show the water information for production or potable wells at these facilities.

Seven wells are grouped under the CFA facility. Wells CFA-1 and CFA-2 serve the actual CFA facility. The other five wells (Badging Facility Well, EBR-1, Fire Station Well, Rifle Range Well, and Site-04 [Dairy Farm]) serve smaller facilities or processes. The Fire Station Well has occasionally been used for filling water trucks for construction purposes. However, for 2013, the Fire Station Well was not used because the pump remains inoperable. The Dairy Farm Well is used for irrigating various research projects. The wells identified at other INL Site facilities provide water primarily for that specific facility.

Each table provides the total monthly volume, average monthly volume, and total annual volume of water diverted from each production or potable well during CY 2013. The tables provide water depth as available. Many of the wells were not designed with an access line to measure the water depth. Each well is identified by its official well name, the most common alias name, and the well identification number. Footnotes are provided where applicable.

Section 5.3 of the Water Rights Agreement states: “The use of water for fire suppression benefits the public. Water diverted for fire suppression may be taken randomly, without a definition of the specific elements of a recordable water right, and if so diverted for fire suppression, existing water rights shall not be diminished.” The volumes in the tables may include water used for fire suppression activities. However, there is no way to distinguish water used for fire suppression and water used for other activities.

Table 1. Advanced Test Reactor Complex water volume for 2013.

Volume in Gallons																
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
TRA-01	NO. 1 DEEP WELL	356	7,318,000	10,411,000	34,766,000	3,988,000	38,024,000	6,593,000	38,053,000	39,000	123,000	27,805,000	9,187,000	39,773,000	216,080,000	18,006,667
TRA-03	NO. 3 DEEP WELL	358	437,000	0	23,000	416,000	29,000	5,000	39,000	1,059,000	3,000	475,000	10,000	21,000	2,517,000	209,750
TRA-04	NO. 4 DEEP WELL	359	31,550,000	23,837,000	5,867,000	47,294,000	7,621,000	49,037,000	12,821,000	53,385,000	47,737,000	10,069,000	26,489,000	843,000	316,550,000	26,379,167
TRA-1863		1863	3,095,500	0	0	1,100	954,400	3,618,600	3,600,500	2,817,500	0	0	0	0	14,087,600	1,173,967
Monthly total			42,400,500	34,248,000	40,656,000	51,699,100	46,628,400	59,253,600	54,513,500	57,300,500	47,863,000	38,349,000	35,686,000	40,637,000		
Total annual volume for ATR Complex: **549,234,600**																
Depth to water, static water level: Date TRA-1863 October 16, 2013 470.86 ft below the brass cap																

Table 2. Central Facilities Area water volume for 2013.

Volume in Gallons																
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
CFA-1	CFA-651	93	1,535,500	1,259,700	1,378,500	1,359,800	6,681,100	8,039,800	12,550,300	12,939,100	124,800	0	0	724,900	46,593,500	3,882,792
CFA-2	CFA-642	94	0	0	3,000	0	0	0	0	727,200	7,100,400	1,651,400	779,700	1,208,400	11,470,100	955,842
Badging Facility Well	B27-605 Main Gate	88	3,620	4,500	7,580	5,710	4,360	7,680	2,450	2,560	4,340	1,300	1,060	1,800	46,960	3,913
EBR-1		149	890	1,488	2,994	361	8,588	11,853	8,252	16,401	4,194	3,265	177	417	58,880	4,907
Rifle Range Well	B21-607 Gun Range	267	1,610	1,490	1,490	1,570	1,370	1,790	1,200	1,180	1,510	1,700	1,250	880	17,040	1,420
Site-04	B16-604 Dairy Farm	273	0	0	0	0	20,960	21,300	20,810	240	70	130	0	0	63,510	5,293
Fire Station Well[a]	Fire Station #2	158	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monthly total			1,541,620	1,267,178	1,393,564	1,367,441	6,716,378	8,082,423	12,583,012	13,686,681	7,235,314	1,657,795	782,187			
Total annual volume for CFA: **58,249,990**																
a. Pump for the Fire Station Well is inoperable. Pump has not been repaired or replaced.																

Table 3. Critical Infrastructure Test Range Complex water volume for 2013.

Volume in Gallons																
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
SPERT-1	PBF Deep Well No. 1	280	44,200	32,900	56,500	52,000	56,000	22,100	76,900	82,900	126,500	121,500	215,300	124,200	1,011,000	84,250
SPERT-2	PBF Deep Well No. 2	281	71,500	57,700	48,000	58,300	11,600	11,600	59,100	184,500	83,500	70,800	0	140,900	797,500	66,458
Monthly total			115,700	90,600	104,500	110,300	67,600	33,700	136,000	267,400	210,000	192,300	215,300	265,100		
Total annual volume for CITRC: **1,808,500**																

Table 4. Idaho Nuclear Technology and Engineering Center water volume for 2013.

			Volume in Gallons													
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
CPP-01	F-UTI-670	98	12,093,000	16,634,000	9,076,000	8,998,000	9,533,000	9,298,000	15,712,000	9,001,000	9,752,000	8,606,000	8,003,000	8,704,000	125,410,000	10,450,833
CPP-02	F-UTI-671	99	10,498,000	4,586,000	10,031,000	5,897,000	8,343,000	7,476,000	14,000	5,440,000	4,460,000	10,167,000	10,090,000	8,324,000	85,326,000	7,110,500
CPP-04 [a]		101	233,553	218,798	228,757	185,237	174,750	182,878	168,108	145,597	220,139	228,617	186,724	221,050	2,394,208	199,517
ICPP-POT-A-012 [a]	F-UTI-699 or CPP-05	1186	233,553	218,798	228,757	185,237	174,750	182,879	168,107	145,598	220,139	228,617	186,723	221,050	2,394,208	199,517
Monthly total			23,058,106	21,657,596	19,564,514	15,265,474	18,225,500	17,139,757	16,062,215	14,732,195	14,652,278	19,230,234	18,466,447	17,470,100		
Total annual volume for INTEC: **215,524,416**																
a. One flow meter was used for potable wells CPP-04 and ICPP-POT-A-012. Operations switched between the wells weekly, so the totals are estimated to be 50% for each well.																

Table 5. Materials and Fuels Complex water volume for 2013.

			Volume in Gallons													
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
EBR-II #1 [a]	EBR-1	150	944,000	841,000	812,500	731,000	978,500	1,022,000	1,151,000	1,248,000	868,500	1,167,500	1,062,500	826,500	11,653,000	971,083
EBR-II #2 [a]	EBR-II	151	944,000	841,000	812,500	731,000	978,500	1,022,000	1,151,000	1,248,000	868,500	1,167,500	1,062,500	826,500	11,653,000	971,083
Monthly total			1,888,000	1,682,000	1,625,000	1,462,000	1,957,000	2,044,000	2,302,000	2,496,000	1,737,000	2,335,000	2,125,000	1,653,000		
Total annual volume for MFC: **23,306,000**																
a. The two wells share one flow meter. Operations switch between the wells, so the totals are estimated to be 50% for each well.																
Depth to water, static water level: Date — EBR-II #1 — EBR-II #2 May 2013 — 658.5 ft bls — 659.0 ft bls November 2013 — 660.3 ft bls — 661.0 ft bls																
bls below land surface																

Table 6. Naval Reactors Facility water volume for 2013.

			Volume in Gallons													
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
NRF-1[a]	1	240	580,000	107,000	0	12,550	0	230,400	30,000	8,000	30,000	20,000	0	164,000	1,181,950	98,496
NRF-2[b]	2	241	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRF-3[c]	3	242	267,940	96,965	334,273	381,680	269,469	123,501	470,782	360,709	295,074	357,450	161,331	132,992	3,252,166	271,014
NRF-4	4	869	1,128,000	304,181	915,000	845,000	1,855,000	4,246,000	5,941,000	11,659,000	2,858,000	1,363,000	1,363,000	1,868,000	34,345,181	2,862,098
NRF-14[c]		2204	400,070	701,000	527,102	406,495	364,154	425,498	204,386	562,521	388,631	401,995	400,581	312,730	5,095,163	424,597
Monthly total			2,376,010	1,209,146	1,776,375	1,645,725	2,488,623	5,025,399	6,646,168	12,590,230	3,571,705	2,142,445	1,924,912	2,477,722		

Total annual volume for NRF: **43,874,460**

a. The flow meter was out of service intermittently during May, June, and July. The volume of water used during this time was conservatively estimated by using the pump run time (hours) on the well's hour meter and the maximum pumping rate of the well.
b. NRF-2 was removed from service in 2006. Future use will be determined.
c. Wells NRF-3 and NRF-14 are used as potable water wells.

Depth to water, static water level:

Date	NRF-3	NRF-14
May 2013	385.93 ft bls	385.47 ft bls
November 2013	387.55 ft bls	387.00 ft bls

Table 7. Radioactive Waste Management Complex water volume for 2013.

			Volume in Gallons													
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
RWMC Production		268	682,100	376,100	334,100	755,000	1,112,100	464,400	382,600	549,800	540,500	557,900	292,100	304,200	6,350,900	529,242
PIT 9 Production Well		2155	0	0	0	0	0	0	0	0	0	153,100	400	0	153,500	12,792
Monthly total			682,100	376,100	334,100	755,000	1,112,100	464,400	382,600	549,800	540,500	711,000	292,500	304,200		

Total annual volume for RWMC: **6,504,400**

Table 8. Test Area North water volume for 2013.

			Volume in Gallons													
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
ANP-01[a]	TAN-612	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANP-02	TAN-613	70	151,300	154,400	146,200	187,100	208,200	100,900	177,400	207,100	123,500	102,800	127,200	85,500	1,771,600	147,633
FET-1	TAN-632	154	0	0	0	0	0	48,800	0	0	0	0	0	0	48,800	4,067
FET-2	TAN-639	155	366,800	318,100	394,800	327,500	1,209,100	740,600	994,000	944,200	490,300	466,500	309,700	413,100	6,974,700	581,225
Monthly total			518,100	472,500	541,000	514,600	1,417,300	890,300	1,171,400	1,151,300	613,800	569,300	436,900	498,600		

Total annual volume for TAN: **8,795,100**

a. Well is maintained as a backup well for ANP-02.

2.2 Combined Total Volume Diverted from All Production and Potable Water Wells

Table 9 provides the combined total volume from all production and potable water wells at the INL Site during CY 2013. Table 9 includes:

- Total monthly volume of water diverted for each major INL Site facility
- Combined total monthly volume diverted from all the major INL Site facilities
- Monthly average volume diverted for all wells combined
- Monthly maximum volume diverted for all wells combined
- Total annual volume diverted at the INL Site.

Table 9. Idaho National Laboratory water volume totals for 2013.

Volume in Gallons												
Facility	January	February	March	April	May	June	July	August	September	October	November	December
Advanced Test Reactor Complex	42,400,500	34,248,000	40,656,000	51,699,100	46,628,400	59,253,600	54,513,500	57,300,500	47,863,000	38,349,000	35,686,000	40,637,000
Central Facilities Area	1,541,620	1,267,178	1,393,564	1,367,441	6,716,378	8,082,423	12,583,012	13,686,681	7,235,314	1,657,795	782,187	1,936,397
Critical Infrastructure Test Range Complex	115,700	90,600	104,500	110,300	67,600	33,700	136,000	267,400	210,000	192,300	215,300	265,100
Idaho Nuclear Technology and Engineering Center	23,058,106	21,657,596	19,564,514	15,265,474	18,225,500	17,139,757	16,062,215	14,732,195	14,652,278	19,230,234	18,466,447	17,470,100
Materials and Fuels Complex	1,888,000	1,682,000	1,625,000	1,462,000	1,957,000	2,044,000	2,302,000	2,496,000	1,737,000	2,335,000	2,125,000	1,653,000
Naval Reactors Facility	2,376,010	1,209,146	1,776,375	1,645,725	2,488,623	5,025,399	6,646,168	12,590,230	3,571,705	2,142,445	1,924,912	2,477,722
Radioactive Waste Management Complex	682,100	376,100	334,100	755,000	1,112,100	464,400	382,600	549,800	540,500	711,000	292,500	304,200
Test Area North	518,100	472,500	541,000	514,600	1,417,300	890,300	1,171,400	1,151,300	613,800	569,300	436,900	498,600
Monthly Totals	**72,580,136**	**61,003,120**	**65,995,053**	**72,819,640**	**78,612,901**	**92,933,579**	**93,796,895**	**102,774,106**	**76,423,597**	**65,187,074**	**59,929,246**	**65,242,119**
Maximum monthly diversion total (gallons)		102,774,106 for August 2013										
Total average monthly volume (gallons)		**75,608,122**										
Annual total for 2013 (gallons)		**907,297,466**										

2.3 Water Use Summary

The INL Site's Federal Reserved Water Right is 35,000 acre-ft/yr (1.14×10^{10} gal/yr) and will not exceed a maximum diversion rate of 80 ft^3/s (35,906 gpm). The total volume of water diverted at the INL Site for CY 2013 was approximately 9.07×10^8 gal (see Table 9) or approximately 8.0% of the annual water right. The maximum diversion rate occurred during August at a rate of 5.13 ft^3/s (2,302 gpm). The average monthly volume of water diverted for all INL Site production and potable wells was approximately 7.56×10^7 gal. The INL Site's water use remained well within the established water right.

3. COMPREHENSIVE WELL INVENTORY, REVISION 22

3.1 Idaho National Laboratory New and Modified Wells in Calendar Year 2013

Two new wells were constructed at the INL Site in CY 2013: USGS-140 and USGS-141. These additions are listed in Table 10. No well modifications were performed in CY 2013.

Well USGS-140 is located approximately 0.5 miles south of the ATR Complex (see Figure A-1). USGS-140 was continuously cored to a depth of 543 ft below land surface (bls) to collect continuous geologic data, re-drilled to 546 ft bls, and completed as a monitoring well. USGS-140 will be used to monitor ongoing water quality and water levels. Drilling for USGS-140 started April 22, 2013, and was completed July 10, 2013. Geophysical and borehole video data were collected throughout the drilling process to examine well construction, geologic, and hydrologic data. Final well construction includes 10-in. -diameter carbon steel casing set to 34 ft bls, 6-in.-diameter carbon steel casing set to 483 ft bls, K-packer (6-in. sealing) set from 475 to 476 ft bls, 5-in.-diameter diameter stainless steel (SS) casing set from 476 to 496 ft bls, and 5-in.-diameter SS wire-wrap well screen set from 496 to 546 ft bls that is capped on the bottom. Approximately 50 ft^3 of Portland Type II cement and bentonite were mixed and pumped down the annular space using a 1-in. tremie line to seal the casing between land surface and 483 ft bls. USGS-140 is configured with a Grundfos™ 5-horsepower SS submersible pump, 4-wire (7-gauge) pump wire, 1.25-in. SS discharge line set to a depth of 526 ft bls, and 1-in. SS water-level line set to a depth of 521 ft bls. Figure A-2 provides construction details.

Well USGS-141 is located approximately 0.5 miles south of the ATR Complex and approximately 375 ft west of USGS-140 (see Figure A-1). USGS-141 was drilled to a depth of 546 ft bls and constructed as a monitoring well. USGS-141 will be used to monitor ongoing water quality and water levels. Drilling for USGS-141 started August 13, 2013, and was completed August 28, 2013. Geophysical and borehole video data were collected throughout the drilling process to examine well construction, geologic, and hydrologic data. Final well construction includes 10-in.-diameter carbon steel casing set to 38 ft bls, 6-in.-diameter carbon steel casing set to 485 ft bls, K-packer (6-in. sealing) set from 475 to 476 ft bls, 5-in.-diameter SS casing set from 476 to 496 ft bls, and 5-in.-diameter SS wire-wrap well screen set from 496 to 546 ft bls that is capped on the bottom. Approximately 63 ft^3 of Portland Type II cement and bentonite were mixed and pumped down the annular space using a 1-in. tremie line to seal the casing between land surface and 485 ft bls. USGS-141 is configured with a Grundfos™ 5-horsepower SS submersible pump, 4-wire (7-gauge) pump wire, 1.25-in. SS discharge line set to a depth of 526 ft bls, and 1-in. SS water-level line set to a depth of 521 ft bls. See Figure A-3 for construction details.

The CWI database maintains detailed well information that can be provided electronically to the State upon request.

Table 10. Idaho National Laboratory new wells constructed in Calendar Year 2013.

Well Name	Type	Borehole Depth (ft bls)	Casing Diameter	Construction Material	Status	Location	Driller/ License #	Comments
USGS-140	Monitoring	546	10 in. from 0 to 34 ft bls 6 in. from -2 to 483 ft bls 5 in. from 476 to 496 ft bls 5 in. from 496 to 546 ft bls	Carbon steel Carbon steel Stainless steel Stainless steel wire wrap screen	Active	T3N, R29E, Sec 23, SW ¼, NE ¼, NW ¼	USGS	Non-CERCLA
USGS-141	Monitoring	546	10 in. from 0 to 38 ft bls 6 in. from -2 to 485 ft bls 5 in. from 476 to 496 ft bls 5 in. from 496 to 546 ft bls	Carbon steel Carbon steel Stainless steel Stainless steel wire wrap screen	Active	T3N, R29E, Sec 23, SE ¼, NW ¼, NW ¼	USGS	Non-CERCLA

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
USGS United States Geological Survey

3.2 Idaho National Laboratory Wells Decommissioned in Calendar Year 2013

Seven wells were decommissioned in CY 2013: ICPP-2024, ICPP-2025, ICPP-2026, ICPP-2027, ICPP-2028, USGS-040, and USGS-137.

Five permitted injection wells (ICPP-2024 through 2028), all approximately 50 ft deep, located at the Vadose Zone Research Park (see Figure B-1), were no longer being used. These wells had been drilled in 2005 for research to determine material movement through the perched water zone created by the New Percolation Ponds. As discharge to the ponds at the Vadose Zone Research Park decreased, these wells did not receive water and became unusable for their intended purpose. A submittal for "Authorization to Decommission a Well" Form and permit cancellation was sent to the Idaho Department of Water Resources (IDWR) (Dossett 2013a) in August, 2013. Approval from IDWR was received September 5, 2013 (Ragan 2013). The wells were decommissioned September 17, 2013, by cutting off the PVC casing approximately 1 ft below land surface, and the well was filled with bentonite and hydrated. The excavated area at the surface was filled with soil/gravel. The completed decommissioning reports were submitted to IDWR on September 24, 2013 (Dossett 2013b). Figures B-2 through B-6 provide construction details for wells ICPP-2024 through -2028.

Well USGS-040 is located in the western portion of INTEC (see Figure B-7). This well had been sampled annually by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program. During April 2011, an attempt was made to sample the well, but the submersible pump failed. When removing the pump, the old galvanized riser pipe had been corroded completely through, and the pump could not be recovered from the well. On September 28, 2011, a downhole videolog was conducted and revealed that the old 4-in. steel well casing was completely corroded and partially collapsed at 456 ft bls (see Figure 1). As a result of the corrosion and collapse of the steel casing, USGS-040 could no longer be sampled. USGS-040 was removed from the groundwater long-term monitoring plan (DOE-ID 2012). The CERCLA Agencies accepted the revised monitoring plan. Because the well could no longer be used for its intended purpose, the well needed to be decommissioned.

A decommissioning plan (PLN-4057) was submitted to the United States Environmental Protection Agency, Idaho Department of Environmental Quality, IDWR, and United States Department of Energy Idaho Operations Office for review. Approval was received from IDWR on June 5, 2012 (MacConnel 2012). An attempt was made using a hydraulic well-perforation tool to perforate the steel casing at 1-ft intervals prior to grouting the well. This work began September 17, 2012. The tool became stuck in the well at 415 ft bls, with the perforation spikes extended. Several attempts were made to free the stuck perforation tool, but with no success. The problem and various alternatives were discussed at length with all entities involved. The final decision was to grout the tool in place (Johansen 2012).

Figure 1. Corroded steel casing in USGS-040 at 454 ft bls.

Well decommissioning activities at well USGS-040 resumed June 17, 2013. The soil around the well was excavated, and the casing was cut to a depth of 2 ft bls. On June 18, 2013, grout was poured into the well from the chute of the grout truck. The grout mixture consisted of 4,000 lb of cement, 2600 lb of water, and 200 lb of bentonite to create a flowable grout mix. Based on the calculated volume, the well should have required approximately 4.5 yd^3 of grout to fill it to the surface; therefore, 5 yd^3 of grout was ordered. All 5 yd^3 of grout was placed in the well, but did not fill the well. Grout was measured to be approximately 85 ft bls. On June 24, 2013, 41 bags of "Bentonite Crumbles" were added to the well, filling it to a depth of 2 ft bls. A concrete cap was poured. As specified in the "Well Decommissioning Plan for INTEC Monitoring Well USGS-40" (PLN-4057), the concrete cap extended from the casing, approximately 2 ft bls, to land surface as one continuous pour. Wire mesh was included in the concrete pad to provide structural stability, and a brass survey marker was installed in the pad (see Figure B-8).

USGS-137 was located approximately 3 miles south of RWMC. During construction of the well, a sediment layer caved in on the drill bit at approximately 250 ft bls. Attempts to recover the drill bit failed as sediment material continued to cave. Therefore, the well was never completed. A Decommissioning Notification was sent to IDWR March 6, 2013, (Stenzel 2013). On March 19, 2013 the surface casing was cut 6 in. bls. Approximately 135 bags (50-lb bags) of 3/8-in. bentonite chips, mixed with approximately 10 gal of water per bag for hydration, were poured into the hole, filling the hole to the surface. A well cap was welded to the well casing, and one 80-lb bag of concrete was used to pour a small concrete pad over the top of the well, level with the land surface. Because construction of USGS-137 was never completed, survey coordinates were not obtained, and a well completion diagram was not completed. Therefore, a map showing the location of USGS-137 is not included in Appendix B.

Table 11. Idaho National Laboratory Wells decommissioned in Calendar Year 2013.

Well Name	Well ID	Type	Status	Method and Date Decommissioned
ICPP-2024	2024	Injection	Decommissioned	Cut 3-in. casing 1 ft bls, filled with bentonite, and hydrated to create seal on 9/17/2013.
ICPP-2025	2025	Injection	Decommissioned	Cut 3-in. casing 1 ft bls, filled with bentonite, and hydrated to create seal on 9/17/2013.
ICPP-2026	2026	Injection	Decommissioned	Cut 3-in. casing 1 ft bls, filled with bentonite, and hydrated to create seal on 9/17/2013.
ICPP-2027	2027	Injection	Decommissioned	Cut 3-in. casing 1 ft bls, filled with bentonite, and hydrated to create seal on 9/17/2013.
ICPP-2028	2028	Injection	Decommissioned	Cut 3-in. casing 1 ft bls, filled with bentonite, and hydrated to create seal on 9/17/2013.
USGS-040	489	Monitoring	Decommissioned	Well casing was perforated from 415 to 456 ft bls on 9/17/12. Tool became stuck. On 6/17/13, casing cut 2 ft bls, hole filled with a flowable grout mix to surface, allowed to settle. On 9/24/13, filled hole with bentonite crumbles to 2 ft bls, then added a concrete pad with wire mesh to surface.
USGS-137	2216	Monitoring	Decommissioned	Casing was cut off 6 in. bls, hole was filled in with bentonite and hydrated to create seal on March 19, 2013.

The CWI database maintains detailed well information that can be provided electronically to the state upon request.

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DOE-ID, 2012, *Operable Unit 3-14, Tank Farm Soil and INTEC Groundwater Long-Term Monitoring Plan*, DOE/ID-11334, Rev. 2, August 2012.

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Street, L. V., INEEL, to D. Dunn, IDWR, September 4, 2001, "INEEL Comprehensive Well Surveys and Annual Water Use Reports," CCN 25370.

Appendix A

Maps and Construction Diagrams for New Wells in 2013

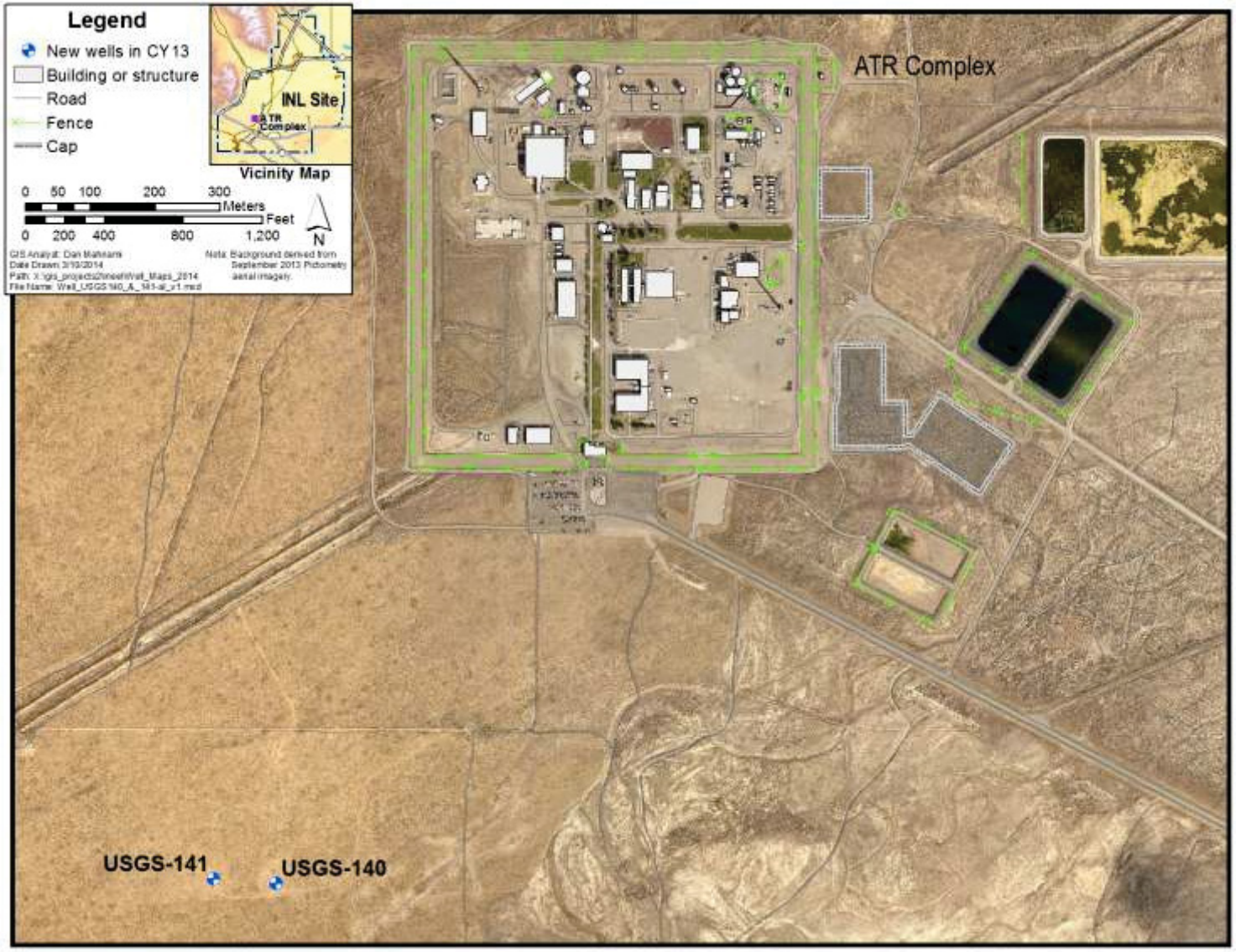


Figure A-1. Map showing locations of new wells USGS-140 and USGS-141.

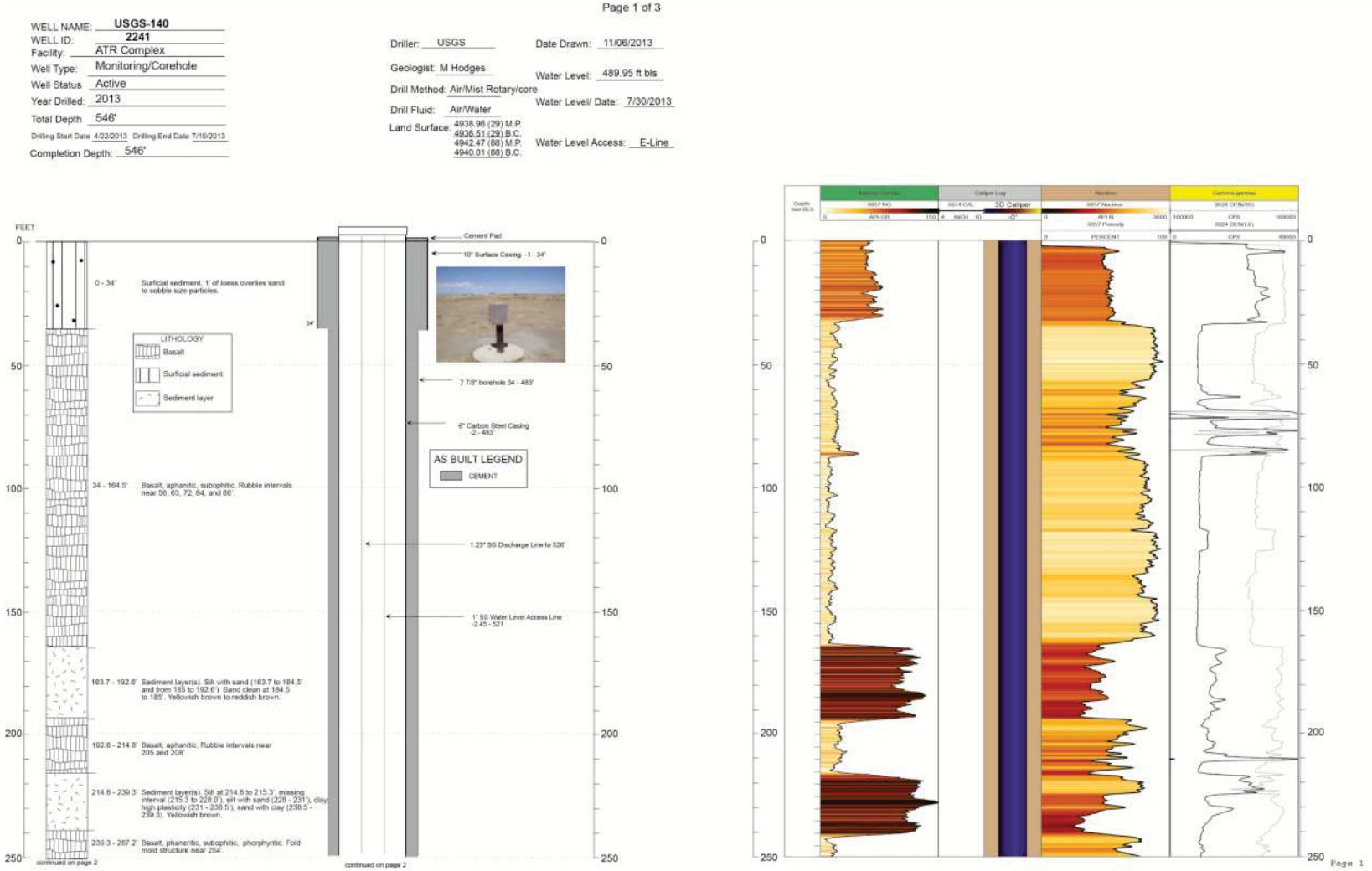


Figure A-2. Construction diagram for new well USGS-140.

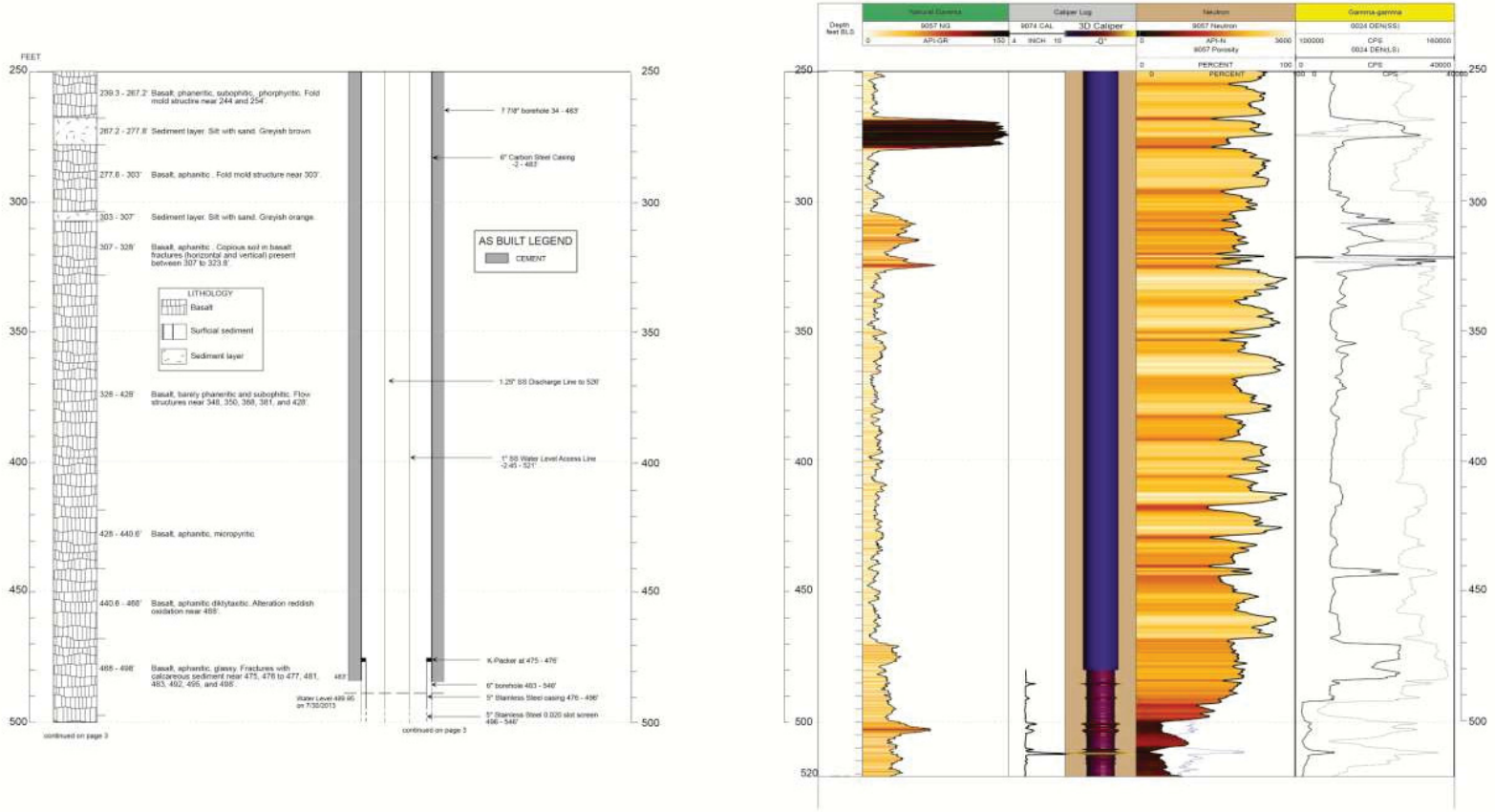
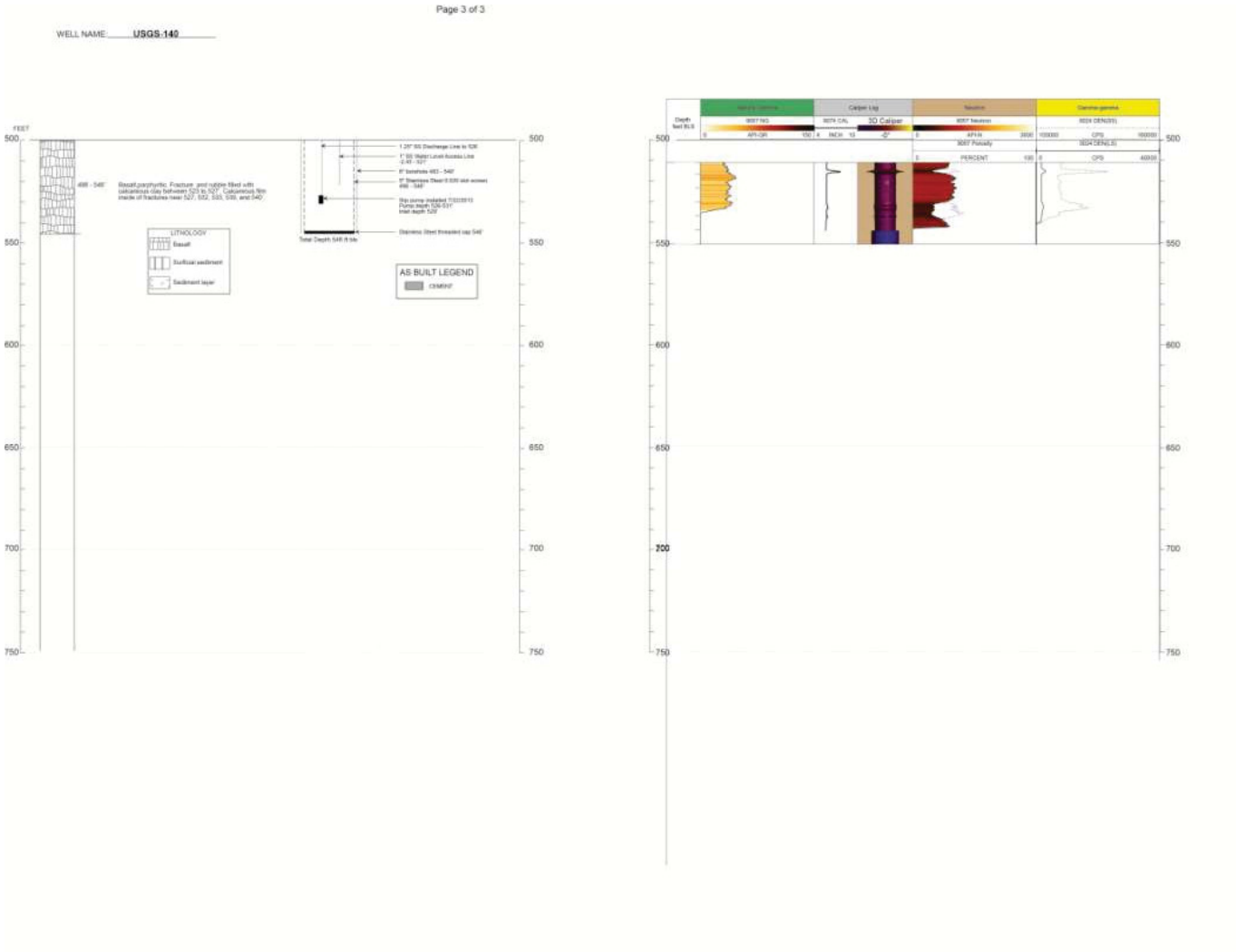


Figure A-2. (continued).



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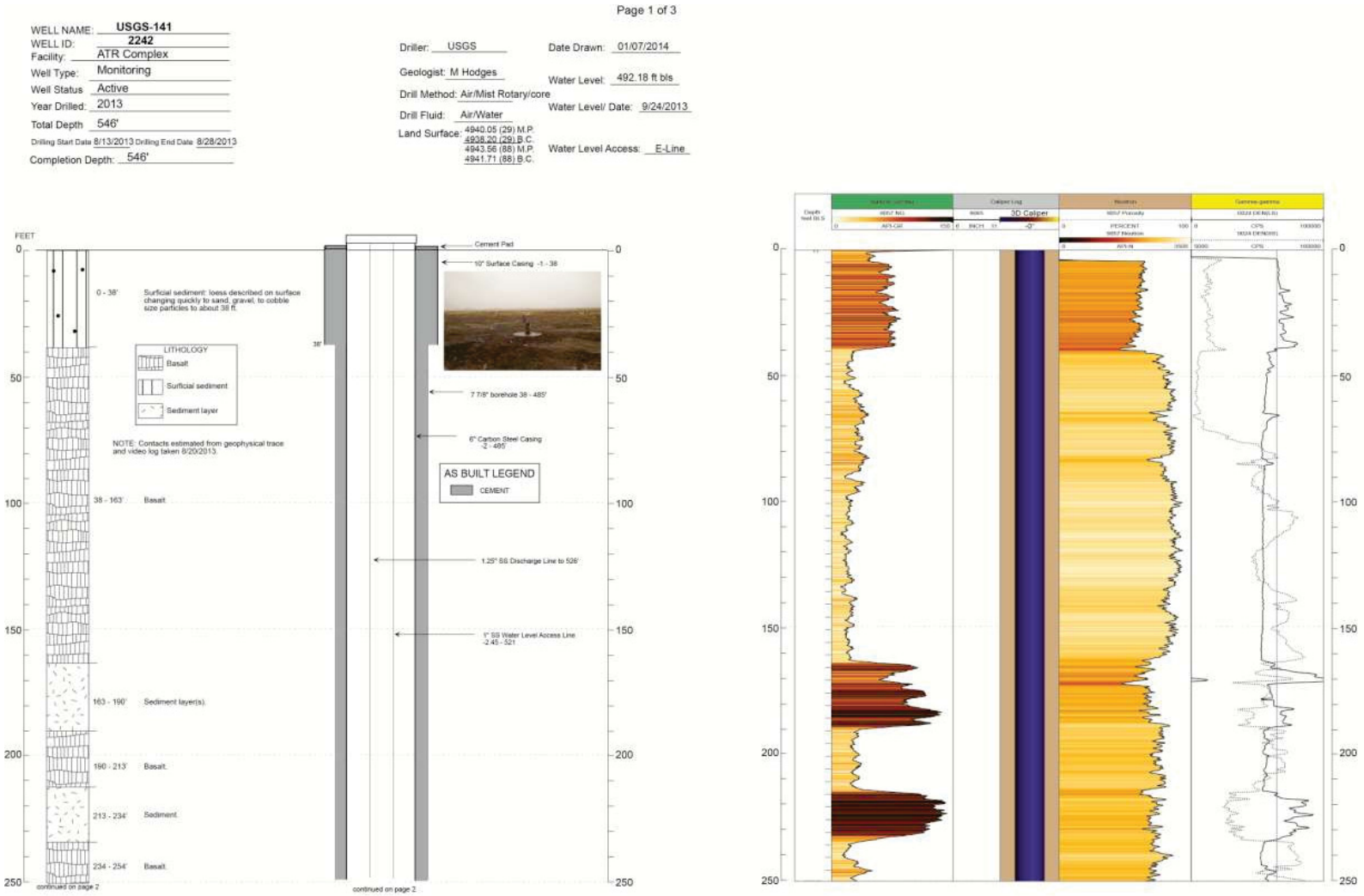
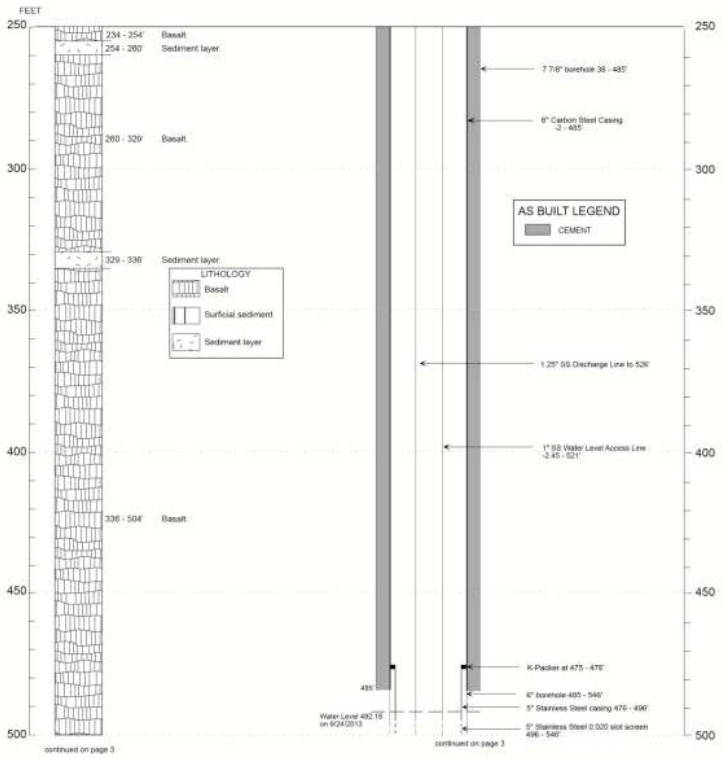


Figure A-3. Construction diagram for new well USGS-141.

WELL NAME: **USGS-141**



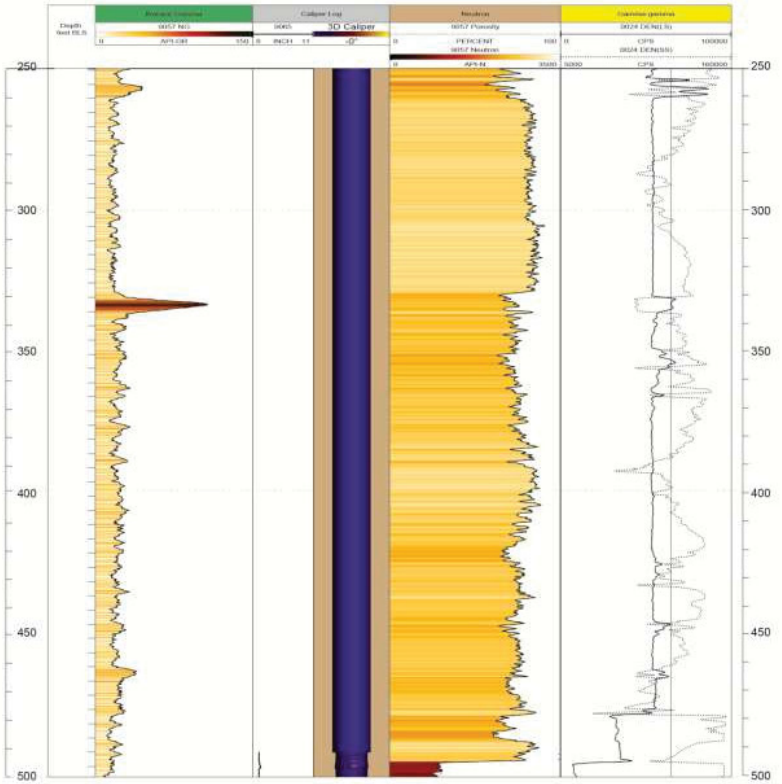
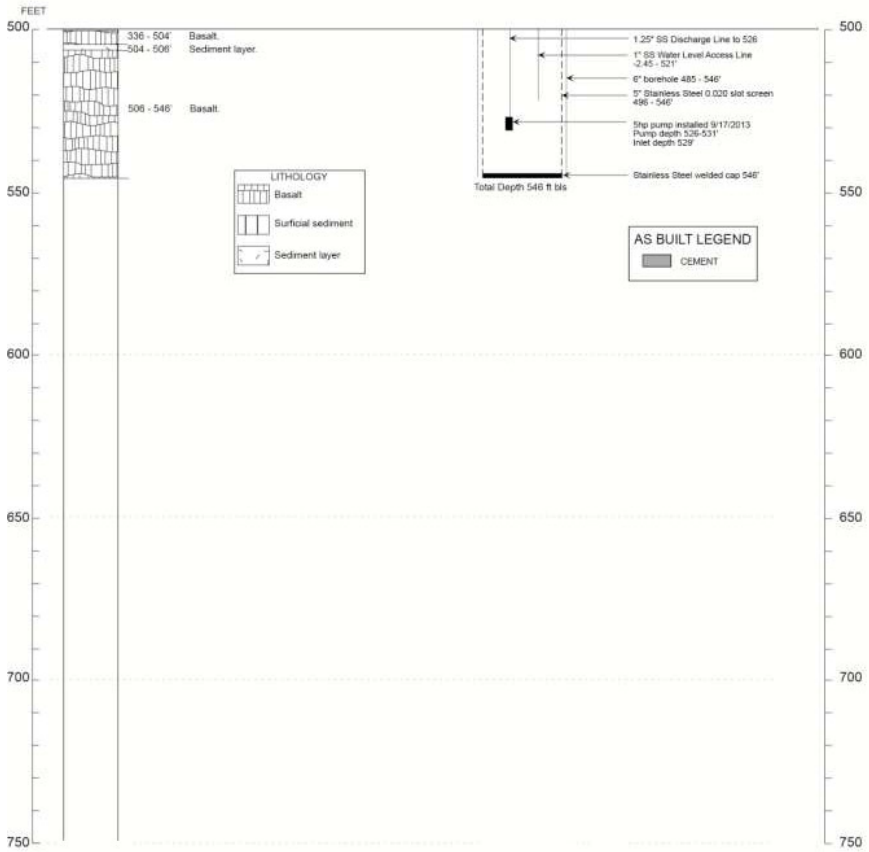


Figure A-3. (continued).

WELL NAME: **USGS-141**



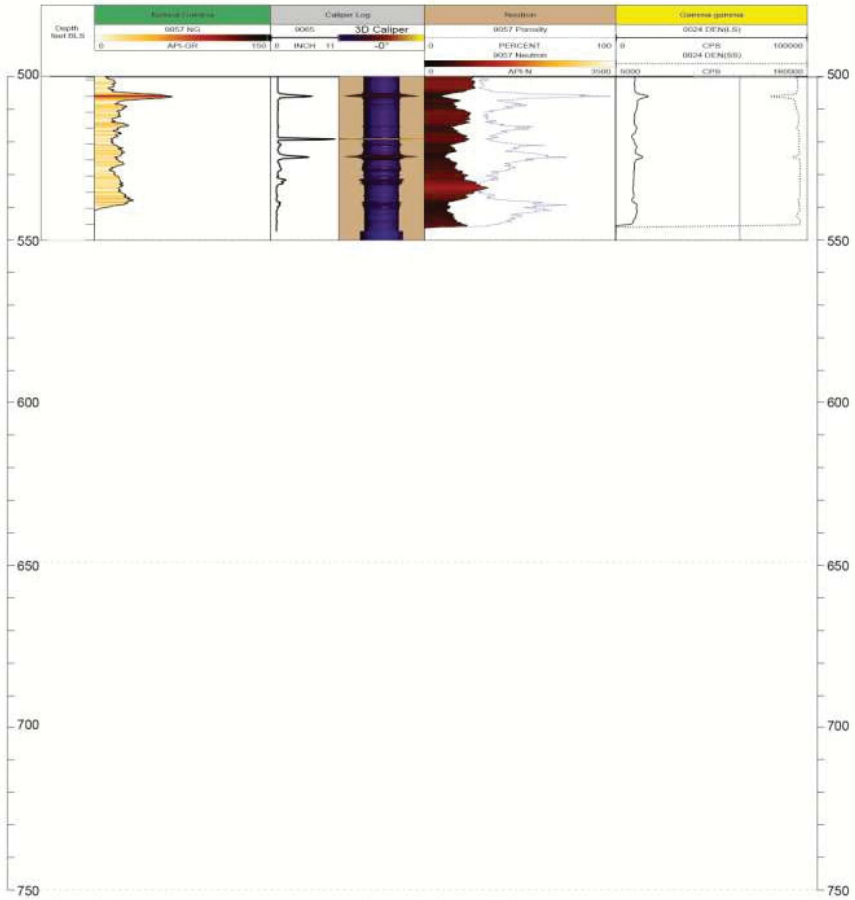


Figure A-3. (continued).

Appendix B

Maps and Construction Diagrams for Decommissioned Wells in 2013

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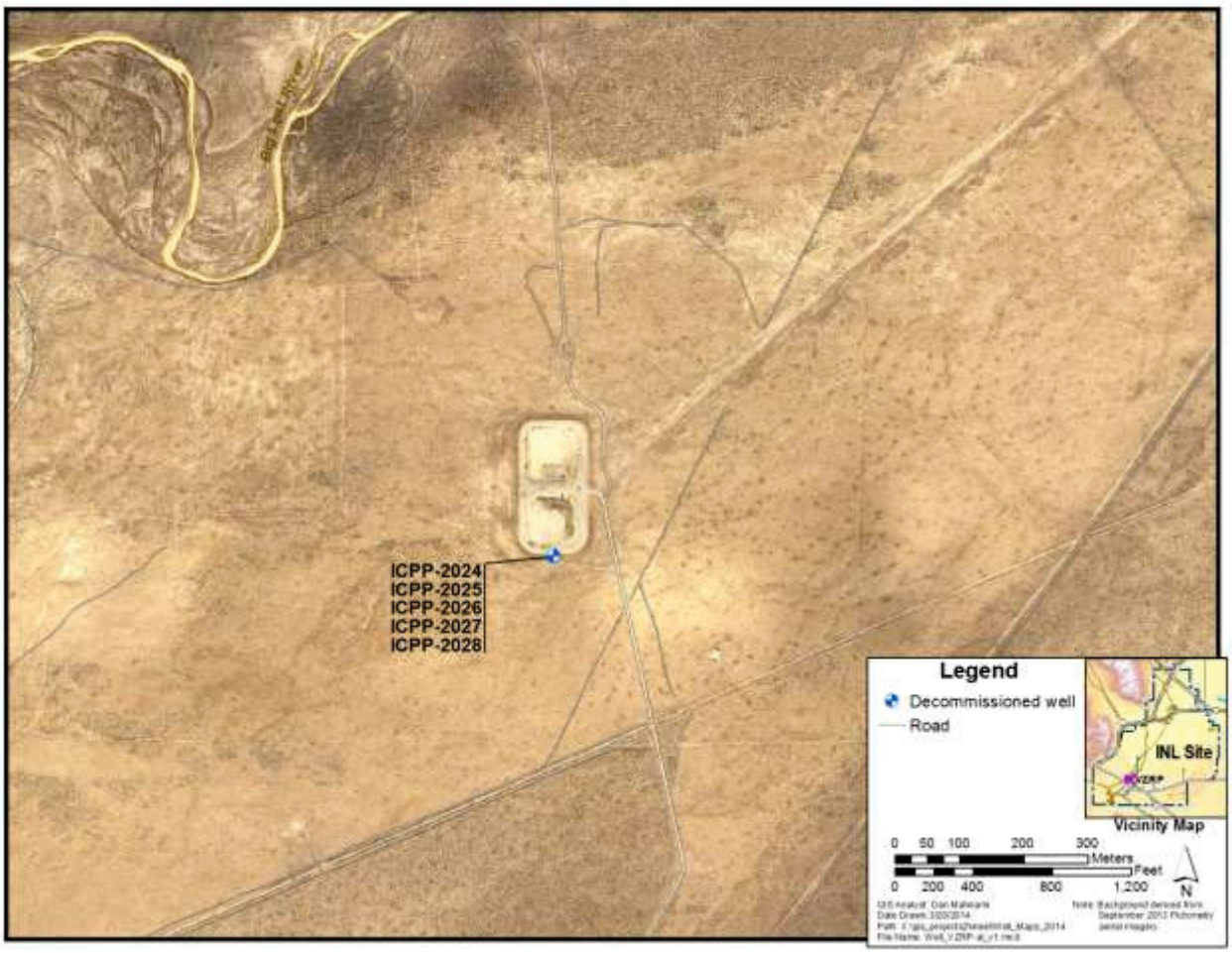

Figure B-1. Map showing location of decommissioned injection wells at the Vadose Zone Research Park.

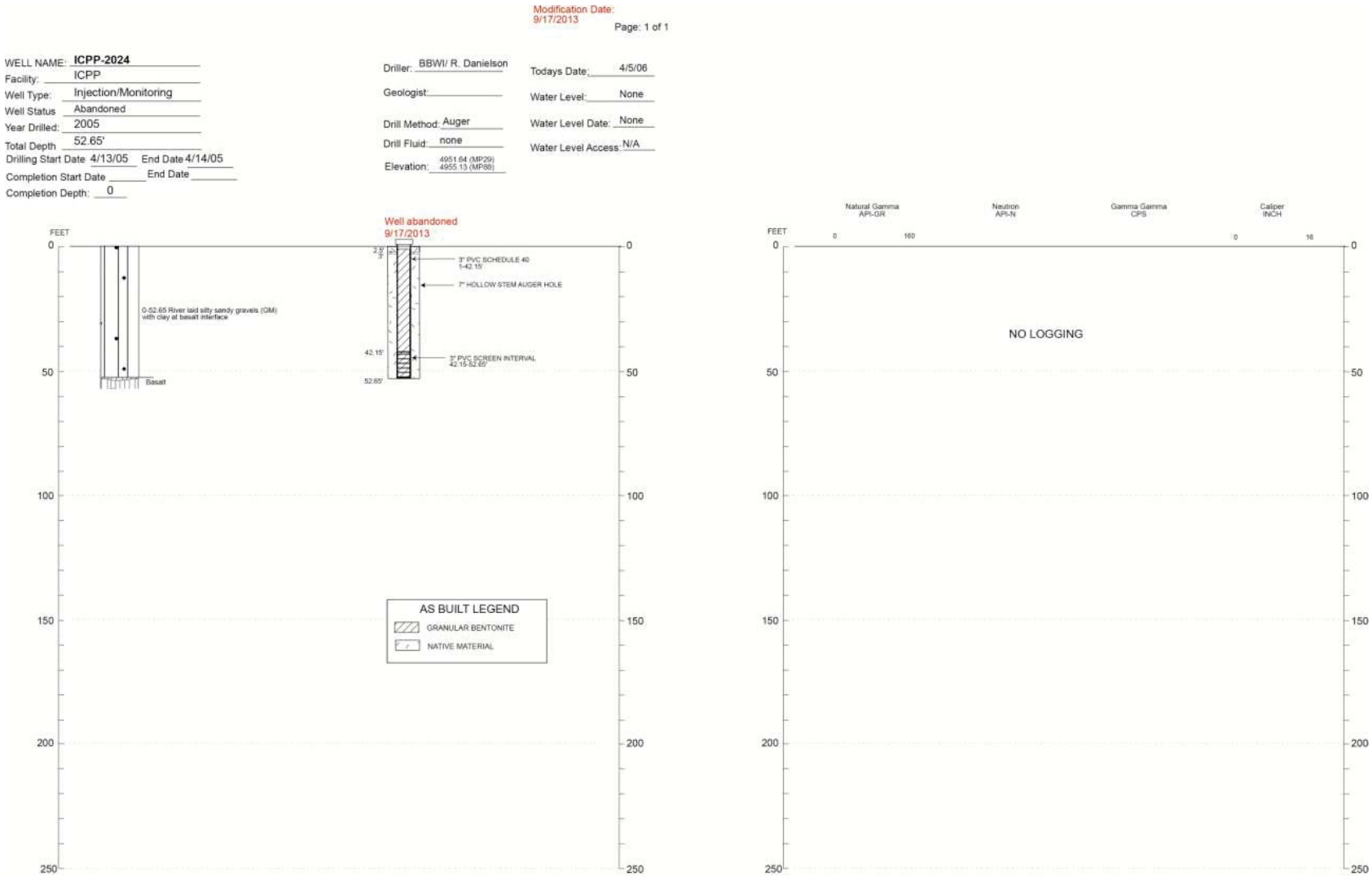

Figure B-2. Construction diagram for decommissioned well ICPP-2024.

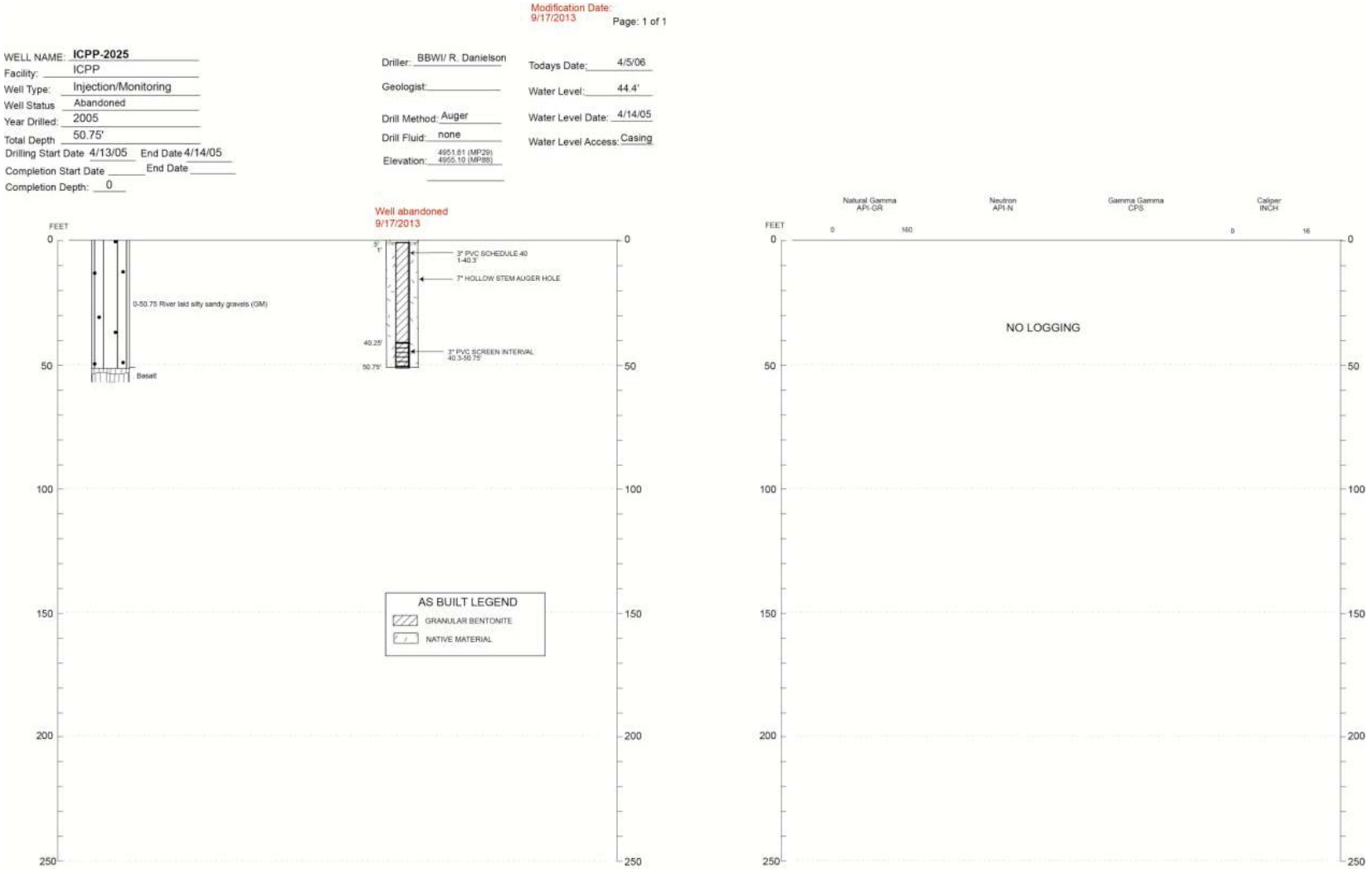

Figure B-3. Construction diagram for decommissioned well ICPP-2025.

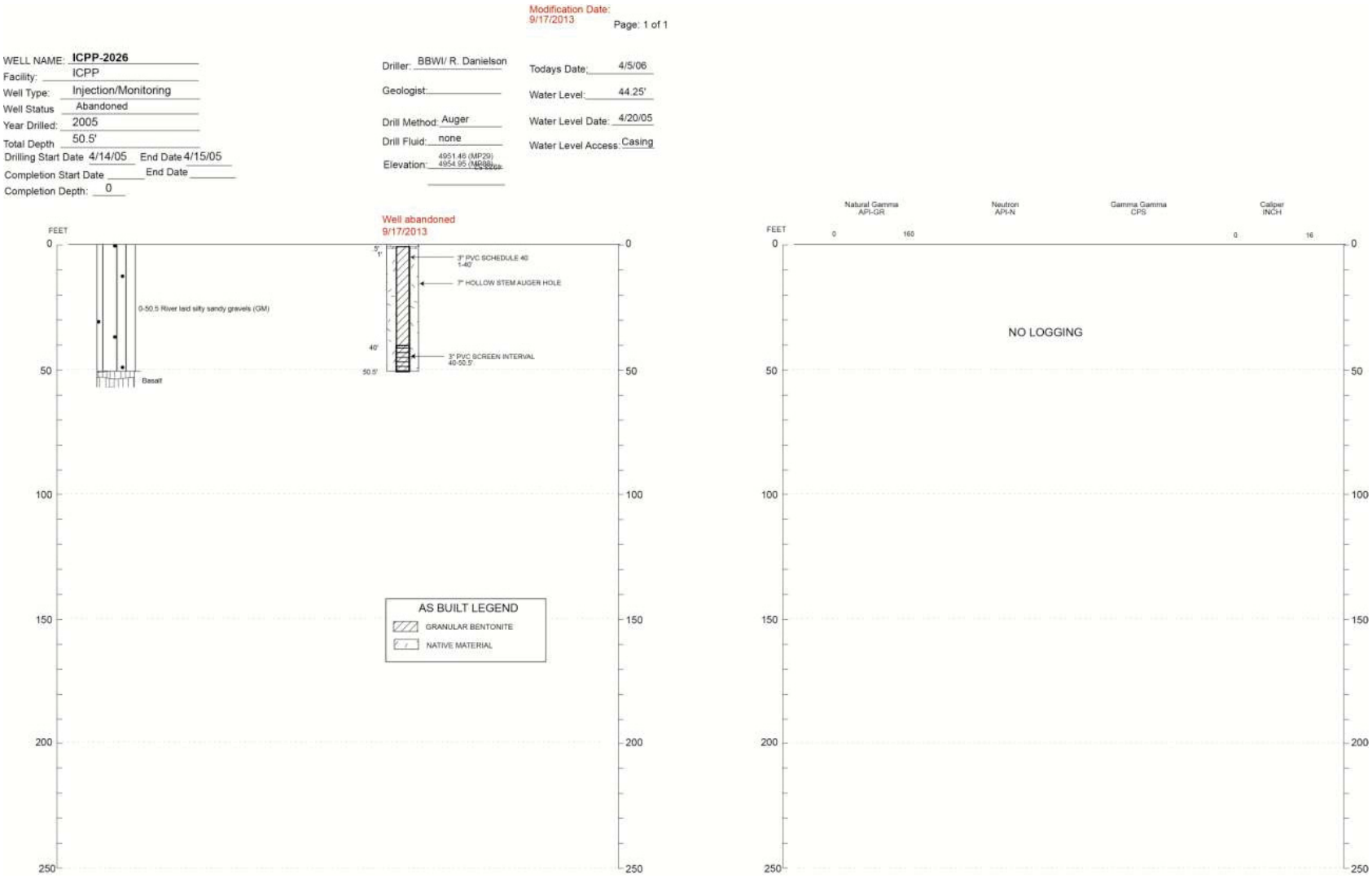

Figure B-4. Construction diagram for decommissioned well ICPP-2026.

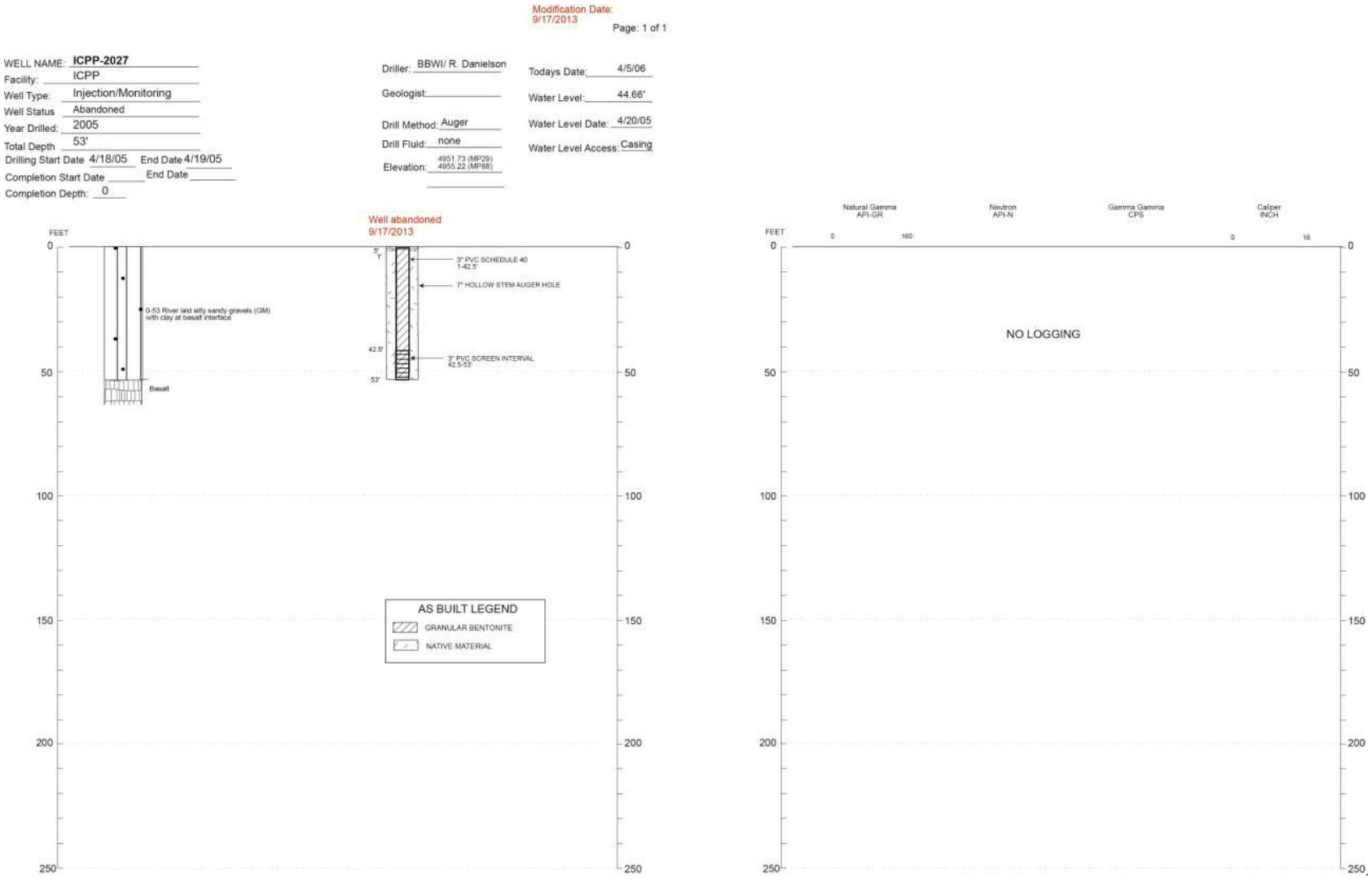

Figure B-5. Construction diagram for decommissioned well ICPP-2027.

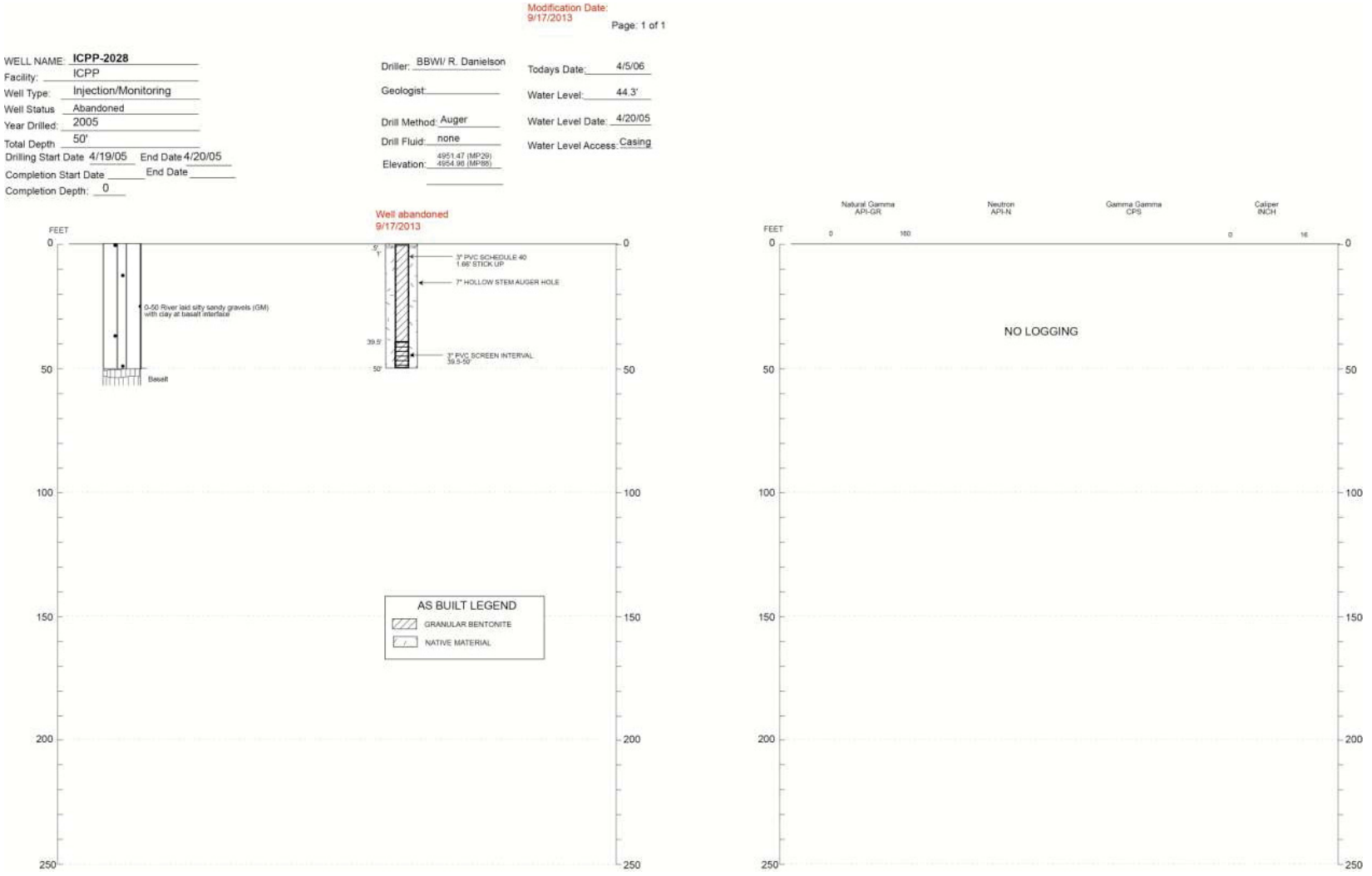

Figure B-6. Construction diagram for decommissioned well ICPP-2028.

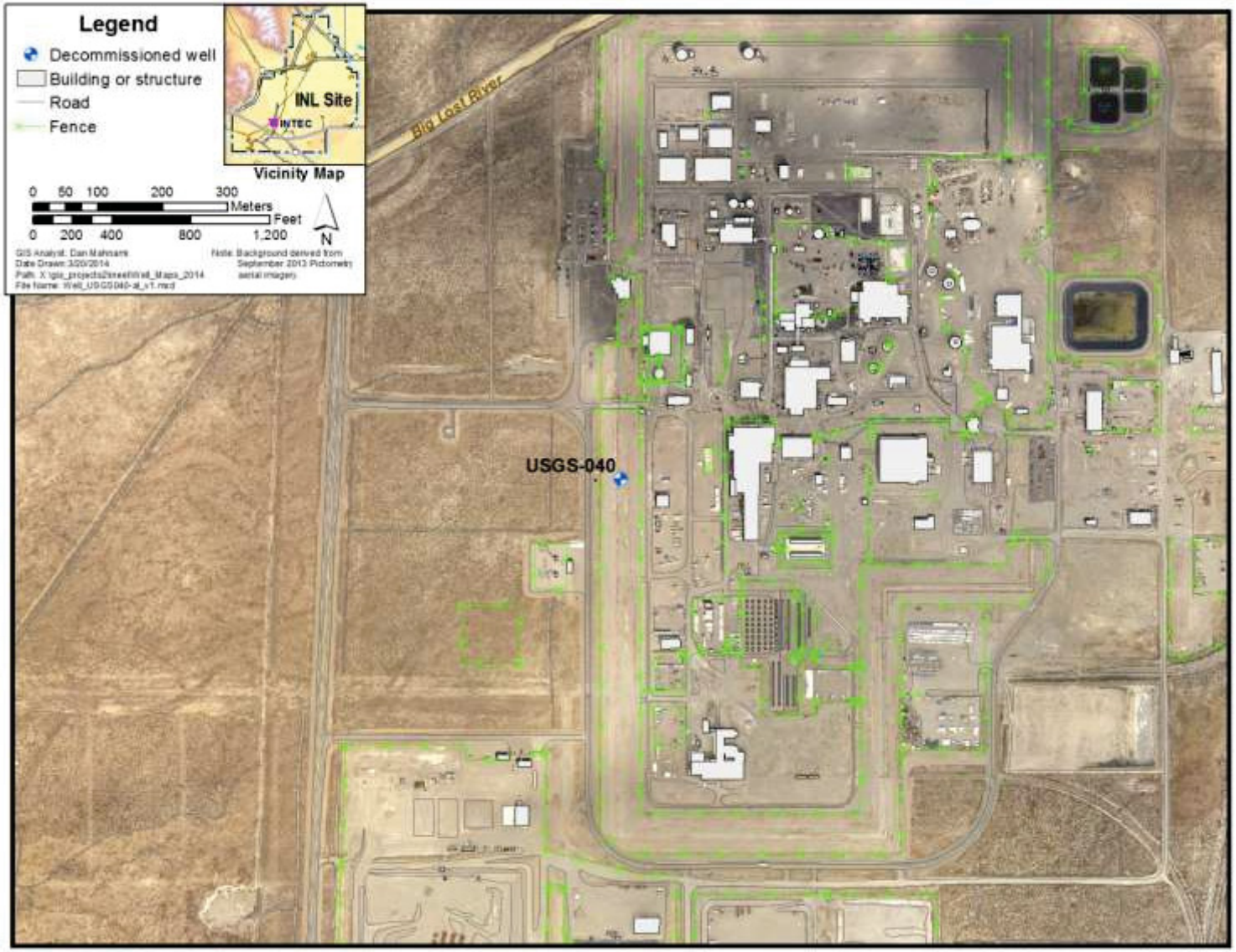

Figure B-7. Map showing location of decommissioned well USGS-040 at INTEC.

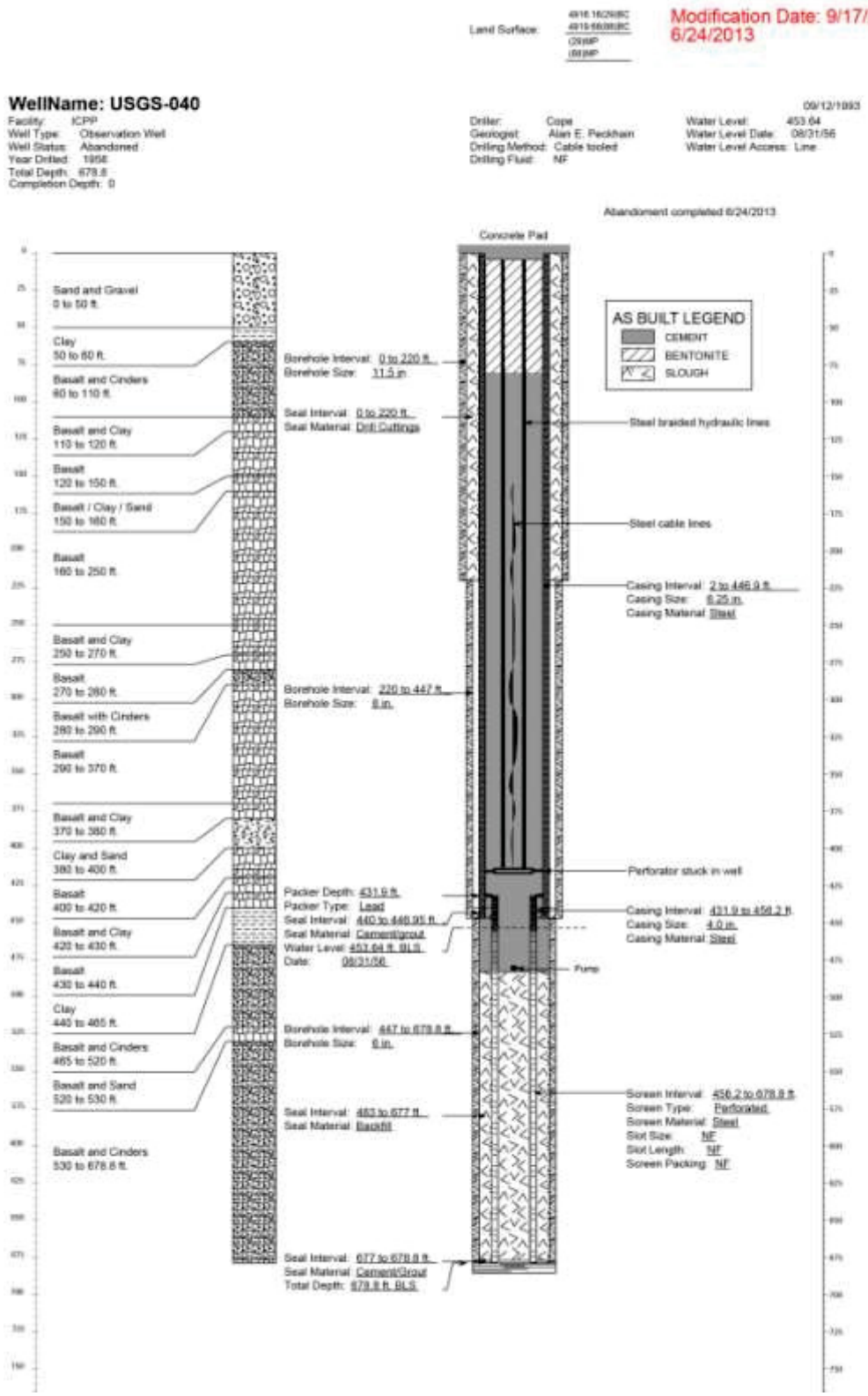

Figure B-8. Construction diagram for decommissioned well USGS-040.