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Date: MAR 2 2 2016
Symbol: EPC-DO-16-064
LA-UR: 16-21518
Locates Action No.: U1501760

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: **Work Plan for Treatment and Land Application of Groundwater from Technical Areas 09 and 16, DP-1793, WP#4**

On July 27, 2015, the New Mexico Environment Department (NMED) issued a Discharge Permit (DP-1793) to the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) for the land application of treated groundwater from covered activities. Pursuant to Condition No. 3 of the above-referenced discharge permit, DOE/LANS are required to submit a detailed, project-specific work plan for approval by NMED before any activities are undertaken.

The enclosed work plan is for the proposed discharge of treated groundwater from aquifer tests conducted to investigate the occurrence of and potential remedial alternatives for high explosives (HE) contamination in deep-perched groundwater associated with the former Outfall at Technical Area (TA)-16. The primary contaminant in groundwater within the study area is RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine), a high explosives (HE) compound widely used in military and industrial applications. Low concentrations of other HE compounds and volatile organic compounds (VOCs) are also present in groundwater in the investigation area.

DOE/LANS propose to conduct three 30-day aquifer tests at monitoring wells CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i). The first test is expected to begin in June 2016 with approximately 30 days of recovery time between each test. The aquifer tests were designed to evaluate the degree of hydraulic connectivity within the perched-groundwater system and to improve the general understanding of transport pathways for RDX and other contaminants to the perched groundwater zones. Additionally, water generated during well development of CdV-9-1(i) will be treated and discharged under this work plan.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this work plan.

Sincerely,

John P. McCann
Acting Division Leader
Environmental Protection & Compliance Division
Los Alamos National Security, LLC

Sincerely,

David S. Rhodes
Supervisor, Soil & Groundwater Remediation
Environmental Management
Los Alamos Field Office
U.S. Department of Energy

JPM:DSR:MTS:RSB/lm

Enclosures:

1) Work Plan for Treatment and Land Application of Groundwater from Technical Areas 09 and 16, DP-1793, WP#4
2) Figures
3) Topographic Map of Project Site
4) As-Built Specifications for TA-16 Wells
5) Analytical Data
6) GAC Well Treatment System Details

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GROUND WATER
MAR 23 2016
BUREAU

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The enclosed work plan is for the proposed discharge of treated groundwater from aquifer tests conducted to investigate the occurrence of and potential remedial alternatives for high explosives (HE) contamination in deep-perched groundwater associated with the former Outfall at Technical Area (TA)-16. The primary contaminant in groundwater within the study area is RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine), a high explosives (HE) compound widely used in military and industrial applications. Low concentrations of other HE compounds and volatile organic compounds (VOCs) are also present in groundwater in the investigation area.

ENCLOSURE 1

Work Plan for Treatment and Land Application of Groundwater from Technical Areas 09 and 16, DP-1793, WP #4

EPC-DO-16-064

LA-UR-16-21518

U1501760

Date: MAR 2 2 2016

Work Plan for Treatment and Land Application of Groundwater from Technical Areas 09 and 16, DP-1793, WP #4

This work plan was developed to address the treatment and land application of well development water and groundwater from planned aquifer testing activities in Technical Area 09 (TA-09) and TA-16, located in the southwest corner of Los Alamos National Laboratory (the Laboratory) (Figure 1 in Enclosure 2). These activities are being conducted to investigate the occurrence of, and potential remedial alternatives for, high explosives (HE) contamination in perched groundwater associated with the former TA-16 260 Outfall (Figure 2 in Enclosure 2).

The primary contaminant in groundwater within the study area is RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine), an HE compound widely used in military and industrial applications. Low concentrations of other HE compounds and volatile organic compounds are also present in groundwater in the investigation area. Much of the RDX contamination originated from historical discharges from the former building 16-260 Outfall (Figure 2 in Enclosure 2). Building 16-260, located on the north side of TA-16 (Figure 2 in Enclosure 2), has been used for processing and machining HE since 1951. Because water was used to machine the HE (which is slightly water soluble), wastewater from machining operations contained dissolved and particulate HE, in particular RDX. From 1951 to 1996, millions of gallons of wastewater was discharged to the 260 Outfall that drained into Cañon de Valle.

A conceptual site model has been developed for the northern portion of TA-16, with principal components being the outfall source areas, Cañon de Valle alluvial system, mesa vadose zone, and the perched and regional aquifers. Figure 3 (Enclosure 2) shows the conceptual site model with an emphasis on the outfall source region, the alluvial system, and the mesa vadose zone. The perched groundwater zone is defined as those zones of saturation located between approximately 650 ft and 1200 ft below ground surface (bgs) in the TA-16 area.

Although several contaminant migration routes are shown in Figure 3 (Enclosure 2), the primary migration pathway likely consists of discharge of HE compounds as effluent from the 260 Outfall, surface flow of effluent to Cañon de Valle via a small tributary drainage, down canyon transport of contaminants by surface water flow and alluvial groundwater, infiltration through the vadose zone recharging perched groundwater zones, and infiltration of that water into the regional aquifer. The perched groundwater has the highest concentrations of HE, and perched groundwater also contains most of the HE mass.

The perched groundwater zones beneath TA-16 probably represent multiple zones with poor vertical hydraulic connection. Perched groundwater occurs in a variety of geologic units, including the Cerro Toledo interval, Otowi Member, and Puye Formation. These zones are potential sources of contaminated recharge to the regional aquifer. Figure 4 (Enclosure 2) shows the hypothesized extent of perched groundwater zones in the study area and the regional water table at TA-16.

The aquifer testing activities referenced in this Work Plan #4 (Work Plan) were designed to evaluate the degree of hydraulic connectivity within the perched-groundwater system and to improve the general understanding of transport pathways for RDX and other contaminants to the perched groundwater zones.

The activities will be conducted in accordance with the following documents submitted by the U.S. Department of Energy (DOE) and Los Alamos National Laboratory (LANS) to the New Mexico Environment Department (NMED):

- *Work Plan for Intermediate Groundwater System Characterization at Consolidated Unit 16-021(c)-99 (August 2015)*
- *Discharge Permit, DP-1793, Los Alamos National Laboratory (July 27, 2015)*

The proposed discharge will consist predominantly of water pumped during the aquifer testing activities but will also include development water from monitoring well CdV-9-1(i) generated in early 2015. All water will be treated before it is discharged.

Project-specific information on the proposed discharge is provided below.

1. **Location.** Wells CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i) and land-application sites are located in the Cañon de Valle watershed and within the following Township/Range/ Sections: T19N/R06E/S29, S30, S31,S32; and T19N/R05E/S36. Figure 2 (Enclosure 2) shows the locations of these wells along with other monitoring wells in the study area.

   Enclosure 3 is a topographic map of the project site, including the location of all site monitoring areas (SMAs), solid waste management units (SWMUs), National Pollution Discharge Elimination System (NPDES) outfalls, groundwater discharge permits, areas of concern (AOCs) identified in the 2005 NMED Compliance Order on Consent, drinking water wells, surface impoundments, and surface drainage features in the vicinity.

2. **Depth to Groundwater and Groundwater Flow Direction.** The depth to perched-intermediate groundwater at well CdV-9-1(i) is approximately 912 ft bgs. The depth to perched-intermediate groundwater at well CdV-16-4ip is approximately 816 ft bgs. The depth to perched-intermediate groundwater at well CdV-16-1(i) is approximately 586 ft bgs. The depth to regional groundwater beneath the proposed land-application sites is approximately 1200 ft. The direction of groundwater flow beneath the proposed land-application sites is generally to the southeast.

3. **Well Specifications**. Table 1 and Enclosure 4 provide the as-built specifications for wells CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i).

Table 1. Well specifications for CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i).

Well	Screen Intervals (ft bgs)	Aquifer	DTW (ft bgs)	TD (ft bgs)
CdV-9-1(i)[1]	937.4–992.4	Perched/intermediate	912	1067.9
CdV-16-4ip[1]	816-879	Perched/intermediate	816	1146
CdV-16-1(i)	624-634	Perched/intermediate	586	657.8

Notes: DTW means depth to water. TD means total depth of the well.

[1] Wells CdV9-1(i) and CdV-16-4ip were originally installed as dual-screened wells. The lower screens have been abandoned, and only the upper screens will be pumped. Additional details on the lower screens are shown in the as-built specifications in Enclosure 4.

4. **Pumping Rate, Duration, Volume.** Table 2 provides the proposed aquifer test parameters for CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i), including information on the pumping rate (in gallons per minute [gpm]), duration (in days), and volume (in gallons per day [gpd]). The estimated volume is based on a 30-d test period for each well. The wells will be pumped sequentially, with an approximately 1- to 2-wk pause between each test.

Table 2. Sources and volumes of water from aquifer testing and volume of development water

Well	Pumping Rate (gpm)	Maximum Daily Volume Pumped (gpd)	Estimated Pumping Period (d)	Estimated Total Volume (gal.)
CdV-9-1(i)	2.5	3600	30	108,000
CdV-16-4ip	7	10,080	30	302,400
CdV-16-1(i)	2	2880	30	86,400
Total Volume of Groundwater Pumped				**496,800**
Volume of Development Water from CdV-9-1(i) Currently in Storage				**78,000**
Total Volume of Water Planned for Treatment and Land Application				**574,800**

In addition to the volume of groundwater produced from aquifer testing at CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i), approximately 78,000 gal. of RDX-contaminated groundwater produced during well development at CdV-9-1(i) in 2015, and currently in storage, will be treated and land-applied under this Work Plan.

The total volume of groundwater proposed for treatment and land application under this Work Plan is approximately 574,800 gal.

5. **Expected Contaminants.** Enclosure 5 contains water-quality data for CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i) as well as for the CdV-9-1(i) development water. Table 3 below provides the maximum concentration of RDX, nitrate (NO_3-N), total dissolved solids (TDS), chloride (Cl), and perchlorate (ClO_4) detected in samples collected in 2014 and 2015. RDX is the only contaminant expected to exceed the New Mexico Water Quality Control Commission (NMWQCC) Regulation 3103 groundwater standards or the NMED Risk Assessment Guidance for Investigations and Remediation Soil Screening Levels for Tap Water (Table A-1, SSLs). The Table A-1 SSL for RDX is 7.02 µg/L.

Table 3. RDX, NO3-N, TDS, Cl, and ClO_4 maximum concentrations at project wells in 2014 and 2015 and in development water from CdV-9-1((i)[1].

Well	RDX (µg/L)	NO-N (mg/L)	TDS (mg/L)	Cl (mg/L)	ClO_4 (µg/L)
CdV-9-1(i)	37.3	2.63	136	9.9	0.43
CdV-16-4ip	152[2]	1.58	130	3.51	0.40
CdV-16-1(i)	32.4	0.93	186	8.32	0.54
CdV-9-1(i) Development Water	242	1.17	460	6.1	0.44

[1] See Enclosure 5.

[2] On-site screening data show a slightly higher maximum value.

[3] Water generated during the pumping test activities is considered nonhazardous via an approved "contained-in" determination from the NMED Hazardous Waste Bureau (NMED-HWB).

Trace concentrations of organic compounds detected in samples from CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i) in 2014 and 2015 are summarized in Table 4. None of the detected organic compounds exceeded NMWQCC 3103 standards or NMED Risk Assessment Guidance for Investigations and Remediation Soil Screening Levels for Tap Water (Table A-1, SSLs).

Table 4. Maximum concentrations of detected organic compounds at project wells in 2014 and 2015.

Constituent	Result[1] 2014–2015 CdV-9-1(i) (µg/L)	Result[1] 2014–2015 CdV-16-1(i) (µg/L)	Result[1] 2014 CdV-16-4ip (µg/L)	NMWQCC 3103 Stds (µg/L)	NMED Table A-1 Tap Water SSLs (µg/L)
Acetone	18.5	ND	2.54	na	14,063
Bis(2-ethylhexyl)phthalate	ND	4.39	ND	na	55.6
HMX	3.56	1.7	9.94	na	1001
MTBE	1.24	1.27	0.79	na	143
Tetrachloroethene	1.01	0.91	1.06	20	40.3
Toluene	ND	13.5	ND	750	1093
Nitrotoluene[2-]	0.12	ND	ND	na	na
Trichloroethene	0.41	ND	0.74	100	2.82

[1] The maximum concentration in 2014–2015. na means that no standard exists for this constituent.
ND means that the constituent was not detected. SSLs mean soil screening levels.

[2] Water generated during the pumping test activities is considered nonhazardous via an approved "contained-in" determination from the NMED-HWB.

In addition to RDX, other organic compounds were detected at trace concentrations in development water from CdV-9-1(i), as summarized in Table 5 below. None of the detected organic compounds exceeded NMWQCC 3103 standards or NMED Risk Assessment Guidance for Investigations and Remediation Soil Screening Levels for Tap Water (Table A-1, SSLs).

Table 5. Organic compounds detected in development water from CdV-9-1(i).

Constituent	Result[1] CdV-9-1(i) Development Water (µg/L)	NMWQCC 3103 Stds (µg/L)	NMED Table A-1, Tap Water SSLs (µg/L)
Amino-2,6-dinitrotoluene[4-]	3.74	na	na
Amino-2,6-dinitrotoluene[2-]	0.668 J[2]	na	na
Butanone[2-]	3.42 J	na	5560
Dichlorobenzene[1,3-]	0.63 J	na	na
HMX	19.2	na	1001
MTBE	1.08	na	143
Nitrotoluene[2-]	0.504 J	na	na

[1] The maximum concentration detected in development water is listed.

[2] J means estimated value.

na means that no standard exists for this constituent.

6. **Untreated Water Storage.** Groundwater pumped from wells CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i) will be treated at the well site and temporarily stored in aboveground 21,000-gal. storage tanks before land disposal. A series of 21,000-gal. storage tanks will be plumbed into the well/treatment system piping (see Enclosure 6) at CdV-16-4ip and CdV-9-1(i) to provide temporary storage for untreated water in the event that the treatment system is temporarily out of service. This will allow pumping to continue uninterrupted when the granular activated carbon (GAC) vessels need replacing.

7. **Treatment System.** The development water and groundwater produced during aquifer testing at CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i) will be treated with GAC before it is discharged. Two GAC treatment systems, a large system and a small system, will be used to remove the RDX during the aquifer testing, depending on the well location. Enclosure 6 provides the schematics for the GAC treatment systems.

   Both GAC treatment systems will remove RDX to less than 6.3 µg/L, 90% of the SSL of 7.02 µg/L in Table A-1 of NMED guidance. The GAC will also remove the organic compounds present in groundwater in the study area (Tables 4 and 5).

   The large system will be used at CdV-9-1(i) and CdV-16-4ip. The large GAC treatment system consists of three sets of two 3.6-ft^3 vessels in series (Enclosure 6). Each vessel is rated for 2 to 10 gpm.

The large system was previously approved by NMED in October 2013 (Revised Temporary Permission to Discharge Treated Well Development and Pump Test Ground Water Discharge from Monitoring Well CdV-16-4ip, DP-1793) and was used to treat RDX-contaminated water generated during a 60-d aquifer test at CdV-16-4ip in 2014. Figure 5 (Enclosure 2) shows RDX concentrations in the influent (untreated water) and effluent (treated water) from CdV-16-4ip during aquifer testing in 2014, based on on-site screening data. RDX concentrations in the influent groundwater averaged 161 µg/L. Concentrations of RDX in 94 % of the treated effluent samples were below the detection limit of 2.0 µg/L. Four of the 71 effluent samples collected showed low levels of RDX, with the maximum concentration detected at 3.8 µg/L per the October 2014 "Interim Measures Report for Source-Removal Testing at Well CdV-16-4ip," submitted to and approved by NMED

The small system is new and will be used at CdV-16-1(i) because the large system cannot be transported down into Cañon de Valle. The small GAC treatment system consists of two 3.6-ft^3 vessels in series (Enclosure 6), each of which is rated for 2 to 10 gpm. The small GAC treatment system is expected to perform much like the large system because the same type of GAC materials will be used for treatment.

8. **Sampling Plan.** As a contingency against the discharge of constituents in excess of land-application criteria, representative samples of treated water will be collected 3 times per week and analyzed for RDX throughout the test for comparison with the land-application criteria of 6.3 µg/L (90% of the NMED Table A-1 SSL). The proposed sampling plan for treated water from Work Plan activities is shown in Table 6. Samples will be analyzed for RDX by analytical laboratories at the Laboratory. Sampling techniques and analytical methods will conform to the requirements of 20.6.2.3107 New Mexico Administrative Code.

   Once per week, a duplicate sample will be submitted for analysis by an off-site, independent, National Environmental Laboratory Accreditation Program– (NELAP-) accredited analytical laboratory. The off-site analytical results will be used to validate the results obtained from on-site analyses.

Table 6. Proposed sampling plan for treated water from Work Plan activities

Parameter	Sample Type	Analytical Method	TAT[1]	Frequency	MDL[2]	Laboratory
RDX	Grab, unfiltered	SW-846:8321A	7 d	1 time/wk	0.1 µg/L	Off-site NELAP-accredited laboratory
RDX	Grab, unfiltered	SW-846:8330	24 h	3 times/wk	2 µg/L	LANL

[1] TAT means the analytical turnaround time.

[2] MDL means the method (or instrument) detection limit.

The following contingencies will be applied under this sampling plan:

- ✓ If RDX concentrations collected under the above sampling plan are less than 6.3 µg/L, then treated groundwater from CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i) will move directly from treated water storage to land application.

- ✓ If an RDX result collected under the above sampling plan exceeds 6.3 µg/L in the treated groundwater, then land application will stop immediately and a representative sample(s) from the storage tank(s) receiving treated water will be collected for RDX analysis.

- ✓ If an RDX result exceeds 6.3 µg/L in the treated groundwater, then the upstream GAC vessel will be replaced by the downstream vessel and a new downstream GAC vessel will be installed.

- ✓ Once the new downstream GAC vessel has been installed, the water in the storage tank(s) water exceeding land-application criteria will be re-treated and reanalyzed to verify RDX concentrations meet land-application criteria.

- ✓ Resumption of land application may occur following replacement of the GAC treatment vessel and verification that RDX concentrations meet land-application criteria.

9. **Treated Water Storage.** Treated development water and groundwater from CdV-9-1(i), CdV-16-4ip, and CdV-16-1(i) will be stored in a series of 21,000-gal. storage tanks before land application.

   The 78,000 gal. of development water from CdV-9-1(i) is stored in four 21,000-gal. storage tanks located on the CdV-9-1(i) well pad. The water will be treated before planned activities begin and will be land-applied before aquifer testing activities begin at wells CdV-9-1(i), CdV 16-4ip, and CdV-16-1(i).

   After the treated development water has been land-applied, the aquifer testing activities will begin. The three wells will be pumped sequentially, starting with CdV-9-1(i), moving on to CdV-16-4ip, and ending with CdV-16-1(i). Wells CdV-9-1(i) and CdV-16-4ip are located on the mesa top, allowing for the placement of the five 21,000-gal. storage tanks on the well pads. Well CdV-16-1(i) is located in Cañon de Valle and space on its well pad is limited. At CdV-16-1(i), treated water will be temporarily stored in four 3000-gal. tanks and then pumped to the mesa top through a single-walled, 2-in. SDR-11 high-density polyethylene pipe. At the mesa top, the water will be stored in a 21,000-gal. storage tank located on the well pad of CdV-16-4ip before land application.

10. **Land Application.** Treated groundwater from all activities and sources referenced in this Work Plan will be land-applied in accordance with requirements of Discharge Permit DP-1793 (July 2015) and the conditions listed below. The following three sections—**Planning, Operational Controls, and Inspections**—provide additional information on the land-application component of this Work Plan.

    - **Planning.** Land-application zones identified in Enclosure 3 were selected and will be utilized based on the following criteria specified in Condition No. 4 of Discharge Permit DP-1793:
        - ✓ Avoidance of watercourses, water bodies, and wetlands;
        - ✓ Avoidance of AOCs;
        - ✓ Avoidance of SWMUs and SMAs;
        - ✓ Avoidance of cultural sites; and
        - ✓ Application on areas with slopes <2% when groundcover is <50% and slopes <5% when groundcover is >50%.

    Spray application of treated groundwater will be suspended a minimum of 20 ft from boundaries of SWMUs, NPDES outfalls, AOCs identified in the 2005 Compliance Order on Consent (Consent Order), drinking water wells, surface impoundments and surface drainage areas, or other areas that are not appropriate as identified in Condition No. 4 of the discharge permit.

    Treated groundwater will be land-applied by water trucks (3,000–10,000-gal. capacity) equipped with both standard rear-mounted dust control sprayers and multiple high-pressure water sprayers. The land-application area was divided into 9 zones, as shown on the map in Enclosure 3. Designation of these zones will facilitate tracking of land-application activities.

    Water trucks will be filled with treated water from the 21,000-gal. storage tanks located next to CdV-9-1(i) and CdV-16-4ip(Figure 2 in Enclosure 2). A totalizing meter will record the volume of treated water loaded into each truck. As much as 30% of the treated water discharged may be land-applied for dust control. The frequency and volume of treated water land-applied for dust control will be based on field conditions. The Operations Manager will determine when an application of dust-suppression water is required. Maintaining a low-dust environment for field personnel is an important health and safety objective for the Operations Manager.

    The road shoulders and adjacent land in zones 1–9 have been identified as suitable terrain for the land application of treated water by high-pressure water sprayers. When deployed by the truck driver, the high-pressure sprayer can land-apply treated water up to 100 ft from the center of the road. The frequency and volume of land application in zones 1 through 9 will be directed by the Operations Manager based on the history of discharges to each zone, a field assessment of soil moisture, and the proximity of the land-application zone to the well being pumped.

- **Operational Controls.** Condition No. 4 of Discharge Permit DP-1793 establishes the following conditions for the land application of treated groundwater:
  - ✓ Land application cannot result in water flowing from an approved land-application site.
  - ✓ Land application cannot create ponds or pools or standing water.
  - ✓ Land application must be conducted in a manner that maximizes infiltration and evaporation.
  - ✓ Land application is restricted to daylight hours and for a maximum of 10 h/d.
  - ✓ Land application must be supervised.
  - ✓ Land application cannot extend off Laboratory property without written permission from the land owner.
  - ✓ Land application is prohibited while precipitation is occurring or when temperatures are below freezing.

To ensure compliance with the conditions listed above, the Laboratory will implement the following operational controls:

a. All field personnel involved with land application will complete training to the following standard operating procedure and regulatory documents:
   - ENV-RCRA-QP-010.3, Land Application of Groundwater
   - NMED-issued Discharge Permit DP-1793, LANL Groundwater Projects (July 27, 2015)
   - DP-1793 WP #4
   - NMED Ground Water Quality Bureau approval of DP-1793 WP #4 (pending)

b. All field personnel will participate in pre-job briefings and morning tailgate talks that will provide field personnel with the following critical information: daily weather reports, daily land-application activities, system maintenance and repairs scheduled, and daily inspection schedule.

c. The beginning and end of each land-application zone will be clearly delineated using cones or other markers which will be deployed daily before land application. The cones or markers will serve as administrative controls to ensure treated water is properly land-applied to the correct zones.

d. Field personnel will maintain written records of the volume and date of treated water land-applied to each zone.

e. The maximum daily discharge of groundwater associated with aquifer and pumping tests, well development and rehabilitation, tracer studies, and groundwater remediation activities for the Laboratory is 350,000 gal., as specified in Discharge Permit DP-1793 (NMED, July 27 2015). Daily discharge volumes will be monitored closely to ensure this volume limit is not exceeded.

- **Inspections.** The following inspections will be conducted on days when land application is implemented to ensure compliance with the land-application criteria specified in Condition No. 4 of Discharge Permit DP-1793 and this Work Plan:
  - ✓ Daily inspection of dust-suppression sprayers, high-pressure sprayers, and all equipment associated with land application by water truck; and
  - ✓ Daily inspection of the land application zones for evidence of standing or flowing water.

11. **Maximum Daily Discharge:** The maximum daily discharge will be 78,000 gal. Administrative controls will restrict the actual volume applied to less than the permitted volume of 350,000 gallons per day (gpd) total for all work plans submitted during this period.

12. **Water Conservation and Reuse Options.** In lieu of using potable water for dust suppression, as much as 30% of the treated water discharged may be land-applied to approximately 1.7 mi of dirt road in TA-16. Because of the project's location, other reuse options—such as using treated water at Laboratory cooling towers—would require transporting the treated water by truck; the resulting environmental impact was deemed unacceptable.

13. **Project Schedule.** Land application will begin following approval of this Work Plan by NMED and will continue until the three 30-d pumping tests are completed. The first pumping test is expected to begin in June 2016.

14. **Reporting.** In accordance with requirements B.8 and B.9 of Discharge Permit DP-1793 (July 27, 2015), DOE/LANS will submit to NMED a final project discharge report within 60 d of completing the approved work plan discharge, and an annual monitoring report by March 1 of each year summarizing all discharges conducted under the DP-1793 Permit. The final project discharge report will include the following:
    - the total volume of groundwater discharged;
    - an estimated average application rate for the period of discharge;
    - analytical results from samples collected under the water-quality sampling plan or soil sampling, if required by NMED; and
    - a map delineating areas that received land-applied groundwater.

The annual monitoring report will summarize all discharges conducted under DP-1793 during the previous calendar year. The report will include quantity, source, and date of each individual discharge, water-quality tables listing analytical results, a map showing discharge locations, and copies of laboratory analytical reports.

ENCLOSURE 2

Figures

EPC-DO-16-064

LA-UR-16-21518

U1501760

Date: MAR 2 2 2016

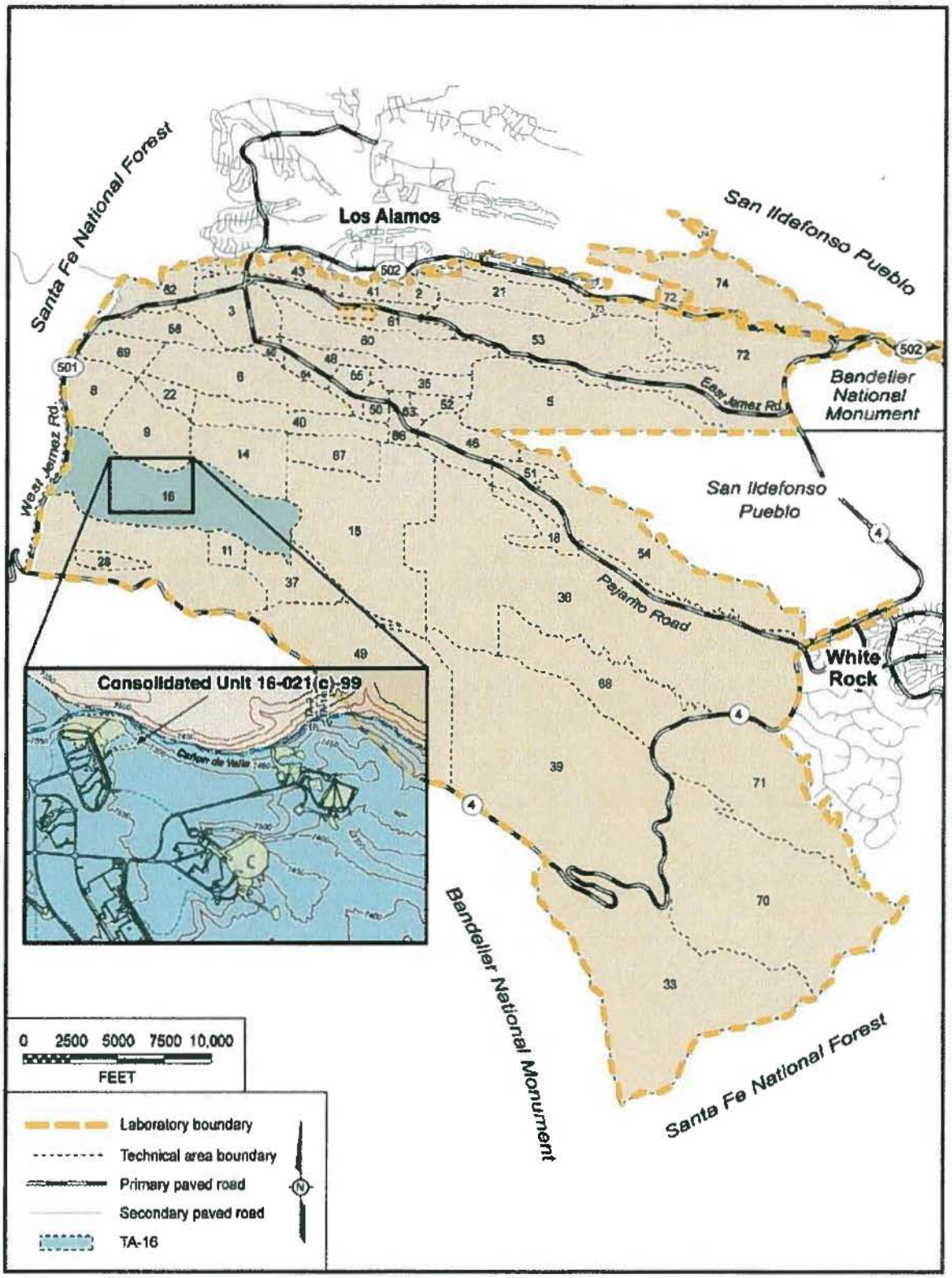


Figure 1 **Location of TA-16 and other Laboratory technical areas at Los Alamos National Laboratory**

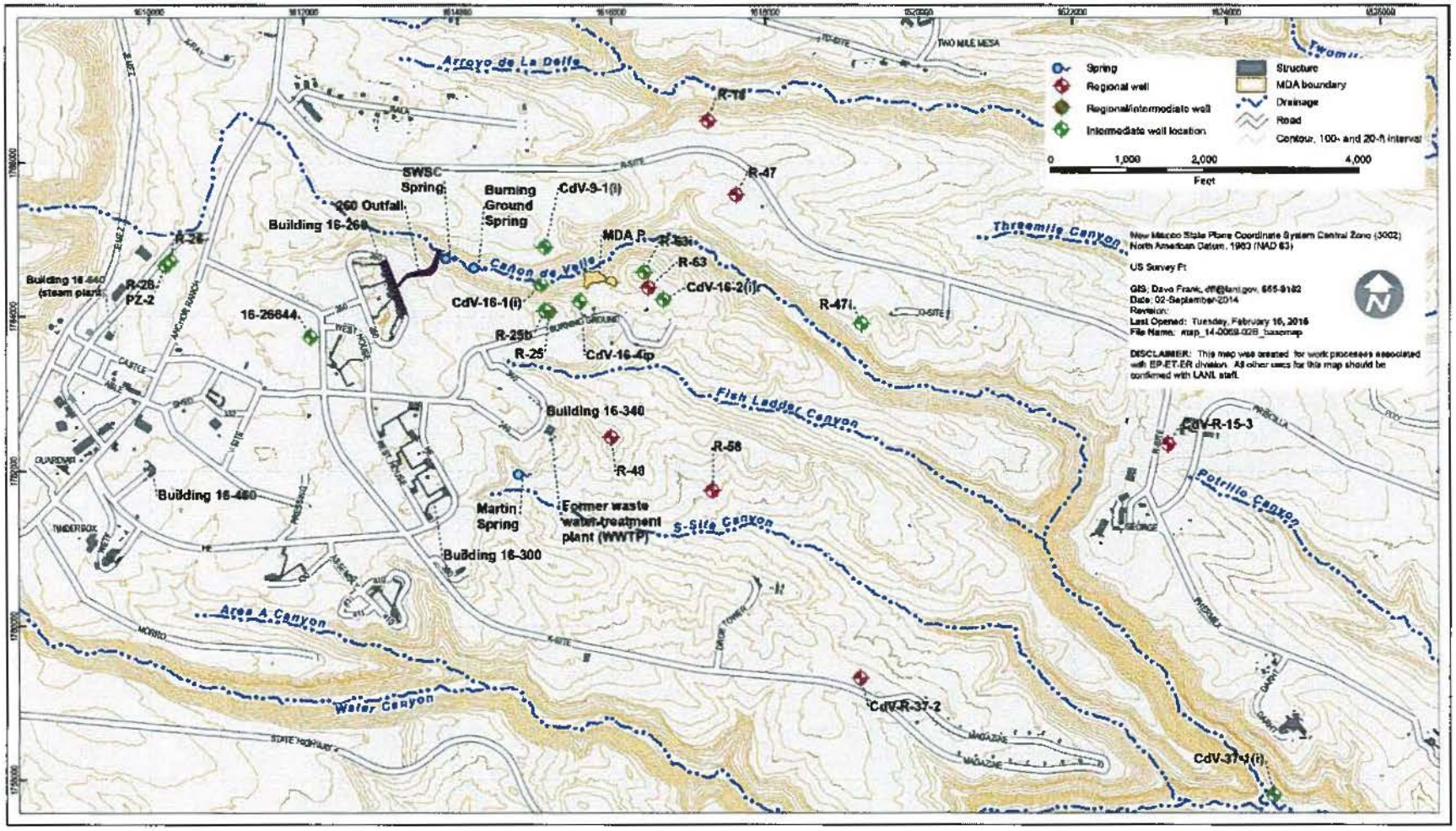


Figure 2 Location of TA-16 monitoring wells

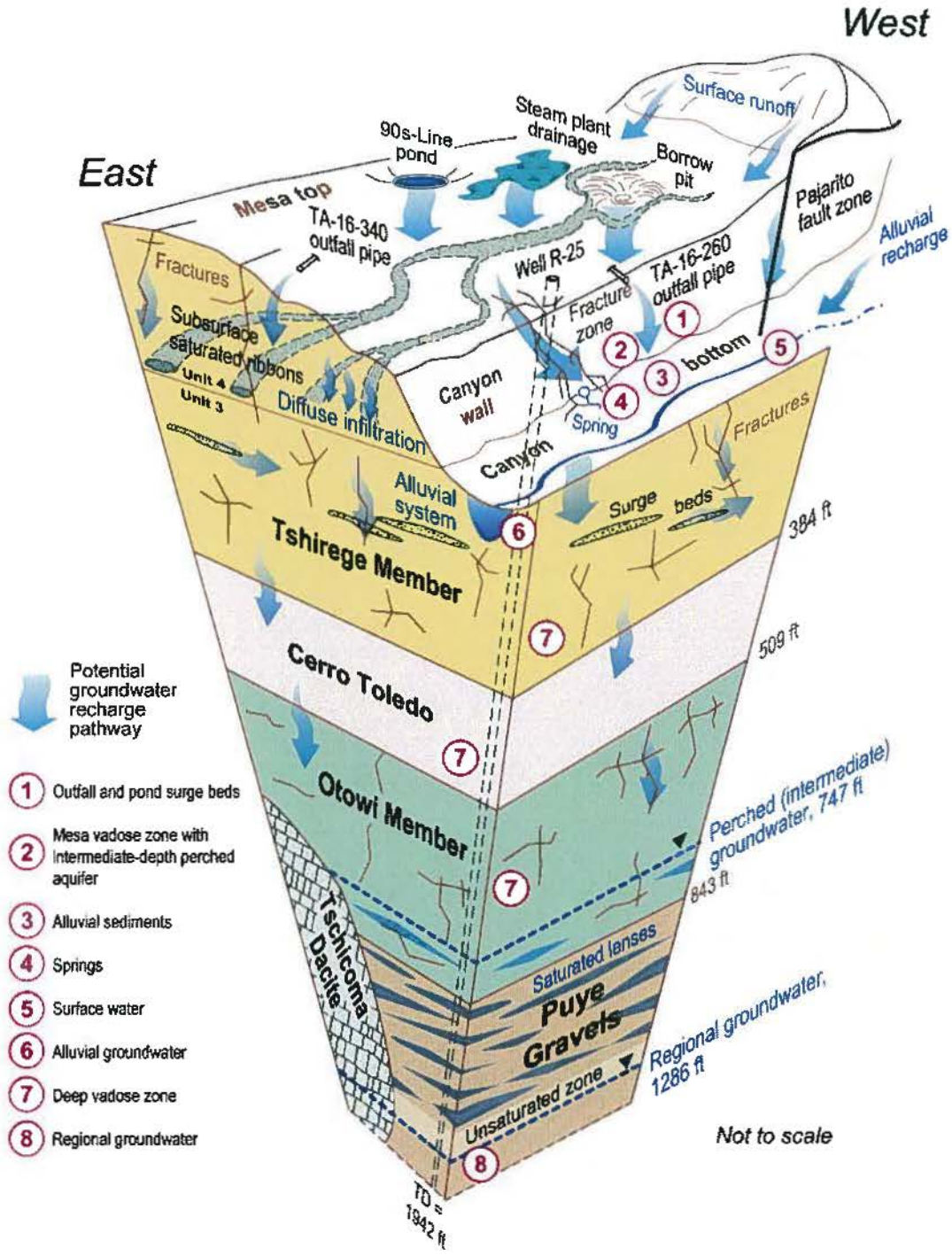


Figure 3 **Conceptual site model for contaminant transport at TA-16, with focus on the outfall source region, alluvial system, and mesa vadose zone**

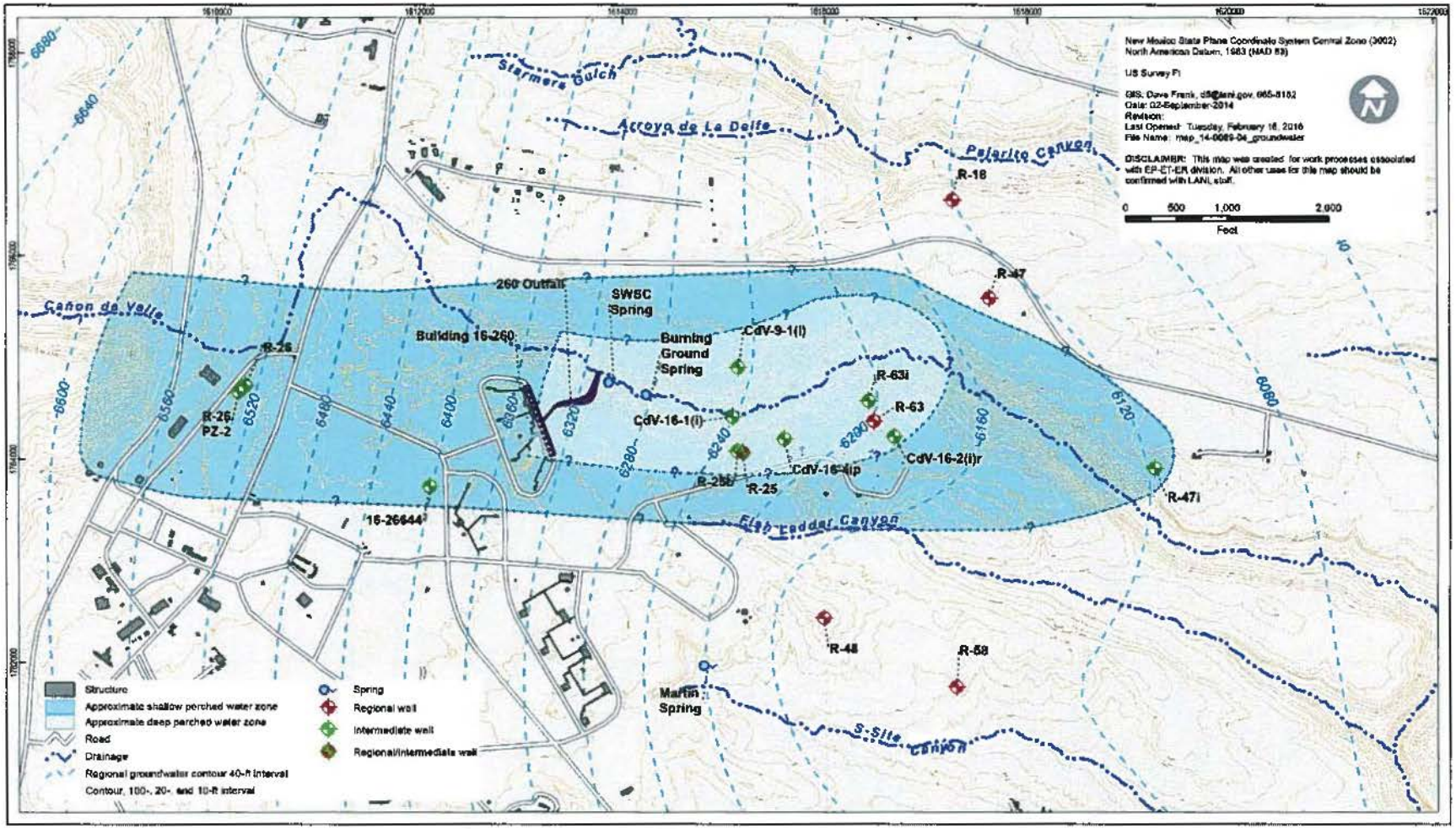


Figure 4 Hypothesized extent of deep-perched groundwater zones in the study area and regional water table at TA-16

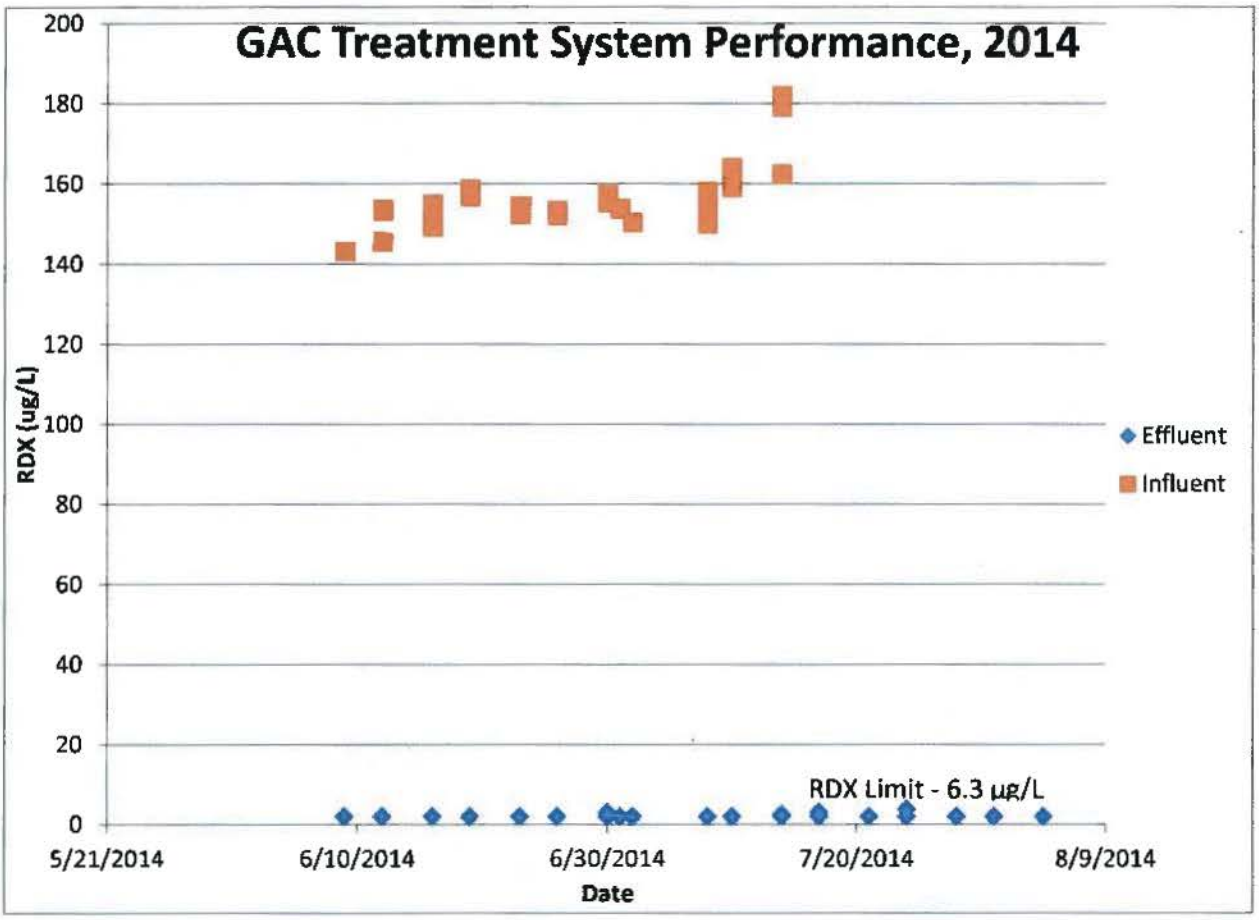


Figure 5 **GAC treatment system, influent and effluent RDX concentrations, 2014.**

ENCLOSURE 3

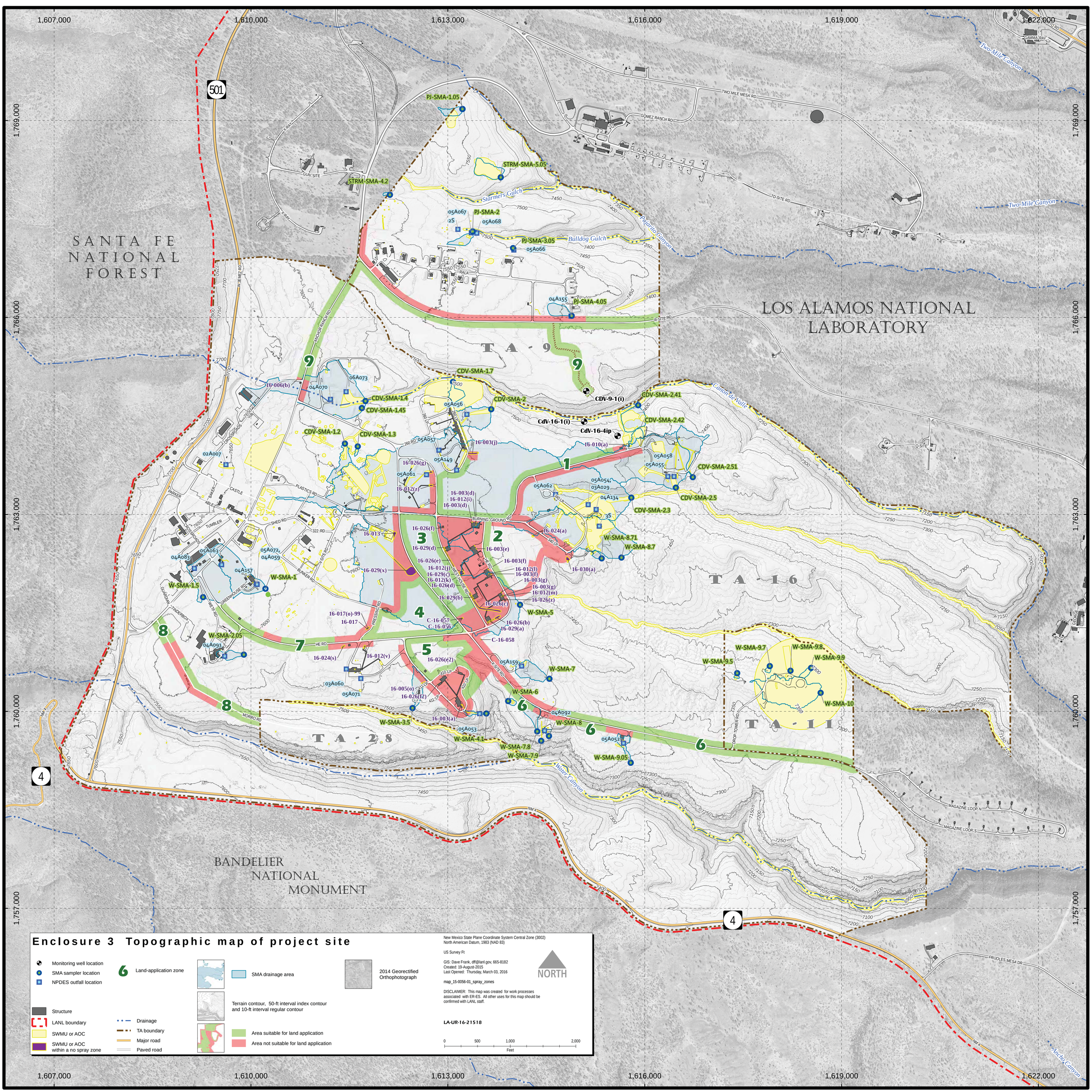
Topographic Map of Project Site

EPC-DO-16-064

LA-UR-16-21518

U1501760

Date: MAR 2 2 2016



Enclosure 3 Topographic map of project site

- Monitoring well location
- SMA sampler location
- NPDES outfall location
- 6 Land-application zone
- Structure
- LANL boundary
- SWMU or AOC
- SWMU or AOC within a no spray zone
- Drainage
- TA boundary
- Major road
- Paved road
- SMA drainage area
- Terrain contour, 50-ft interval index contour and 10-ft interval regular contour
- Area suitable for land application
- Area not suitable for land application
- 2014 Georectified Orthophotograph

New Mexico State Plane Coordinate System Central Zone (3002)
North American Datum, 1983 (NAD 83)

US Survey Ft

GIS: Dave Frank, dff@lanl.gov, 665-8182
Created: 19-August-2015
Last Opened: Thursday, March 03, 2016

map_15-0056-01_spray_zones

DISCLAIMER: This map was created for work processes associated with ER-ES. All other uses for this map should be confirmed with LANL staff.

LA-UR-16-21518

NORTH

0 500 1,000 2,000
Feet

Document Path: \\slip\gis\GIS\Projects\15-Projects\15-0056\mxd\map_15-0056-01_spray_zones.mxd

ENCLOSURE 4

As-Built Specifications for TA-16 Wells

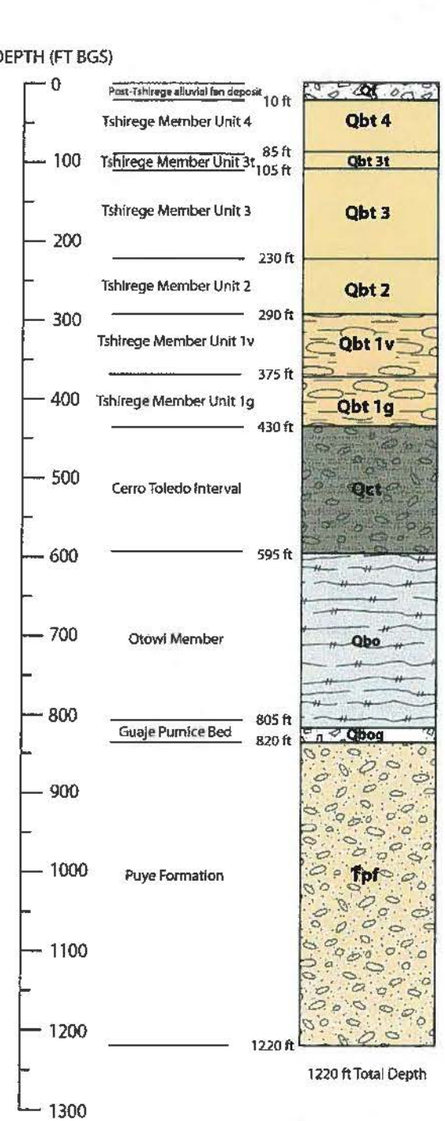
EPC-DO-16-064

LA-UR-16-21518

U1501760

Date: MAR 2 2 2016

★SEE FIGURE 8.3-1b FOR CdV-9-1(i) TECHNICAL NOTES

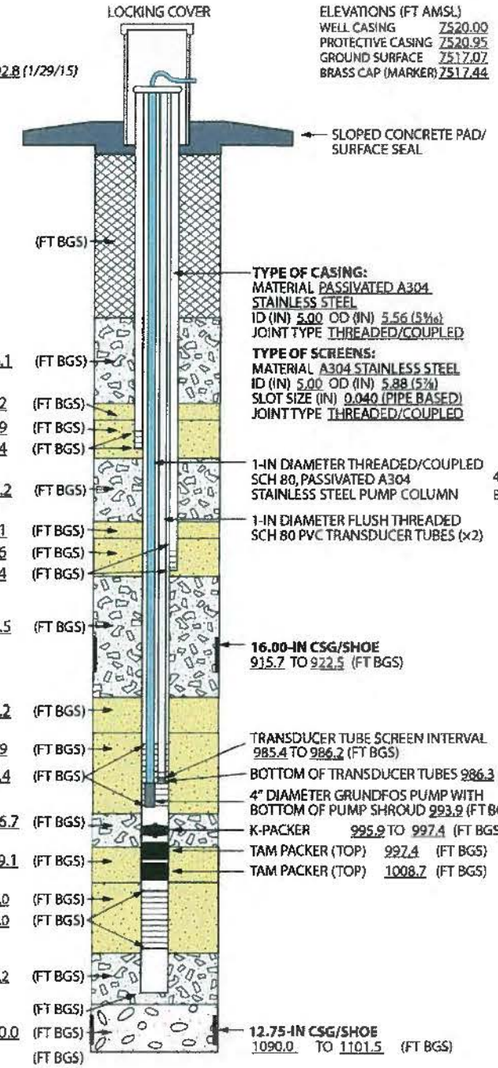


BOREHOLE LITHOLOGY

TOTAL LENGTH OF CASING AND SCREEN (FT) 1070.4

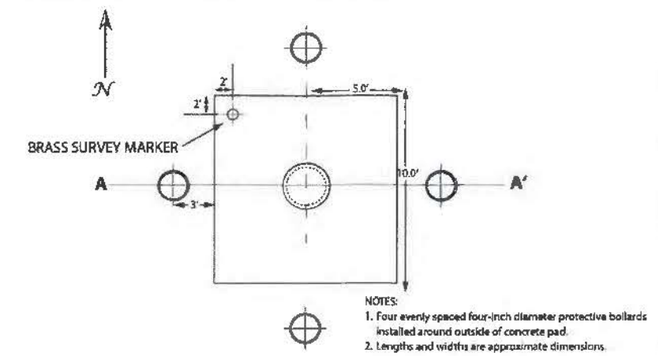
DEPTH TO WATER FOLLOWING INSTALLATION (FT BGS) 892.8 (1/29/15)

ELEVATIONS (FT AMSL)
WELL CASING 7520.00
PROTECTIVE CASING 7520.95
GROUND SURFACE 7517.07
BRASS CAP (MARKER) 7517.44



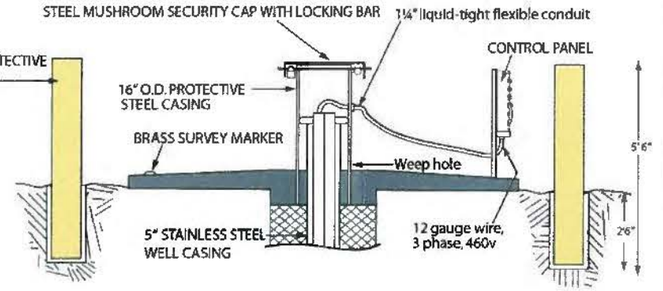
SURFACE SEAL	3	TO	60.3	(FT BGS)
HYDRATED BENTONITE CHIP SEAL	60.3	TO	656.1	(FT BGS)
20/40 SAND COLLAR	656.1	TO	658.2	(FT BGS)
10/20 SANDFILTER PACK	658.2	TO	676.9	(FT BGS)
SCREENED INTERVAL	662.9	TO	672.4	(FT BGS)
HYDRATED BENTONITE CHIP SEAL	676.9	TO	846.2	(FT BGS)
20/40 SAND COLLAR	846.2	TO	848.1	(FT BGS)
10/20 SAND FILTER PACK	848.1	TO	867.6	(FT BGS)
SCREENED INTERVAL	852.9	TO	862.4	(FT BGS)
HYDRATED BENTONITE CHIP SEAL	867.6	TO	930.5	(FT BGS)
20/40 SAND COLLAR	930.5	TO	932.2	(FT BGS)
10/20 SAND FILTER PACK	932.2	TO	996.9	(FT BGS)
SCREENED INTERVAL	937.4	TO	992.4	(FT BGS)
HYDRATED BENTONITE CHIP SEAL	996.9	TO	1016.7	(FT BGS)
20/40 SAND COLLAR	1016.7	TO	1019.1	(FT BGS)
10/20 SAND FILTER PACK	1019.1	TO	1050.0	(FT BGS)
SCREENED INTERVAL	1023.7	TO	1045.0	(FT BGS)
BENTONITE BACKFILL	1050.0	TO	1183.2	(FT BGS)
BOTTOM OF CASING	1067.9			(FT BGS)
SLOUGH	1183.2	TO	1220.0	(FT BGS)
BOTTOM OF BORING	1220			(FT BGS)

WELL COMPLETION DETAILS

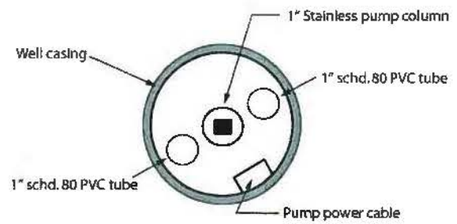


NOTES:
1. Four evenly spaced four-inch diameter protective bollards installed around outside of concrete pad.
2. Lengths and widths are approximate dimensions.

PLAN VIEW-SURFACE COMPLETION



WELL HEAD DETAILS
SECTION A-A'



PLAN VIEW-WELL HEAD LANDING PLATE

TerranearPMC	MONITORING WELL CdV-9-1(i) AS-BUILT WELL DIAGRAM Technical Area 9 (TA-9) Los Alamos National Laboratory Los Alamos, New Mexico	Figure 8.3-1a NOT TO SCALE
Drafted By: TPMC Project Number: 86314	Date: May 11, 2015 Filename: CdV-9-1i...Fig8.3-1a	

Figure 8.3-1a Monitoring well CdV-9-1(i) as-built diagram with borehole lithology and technical well completion details

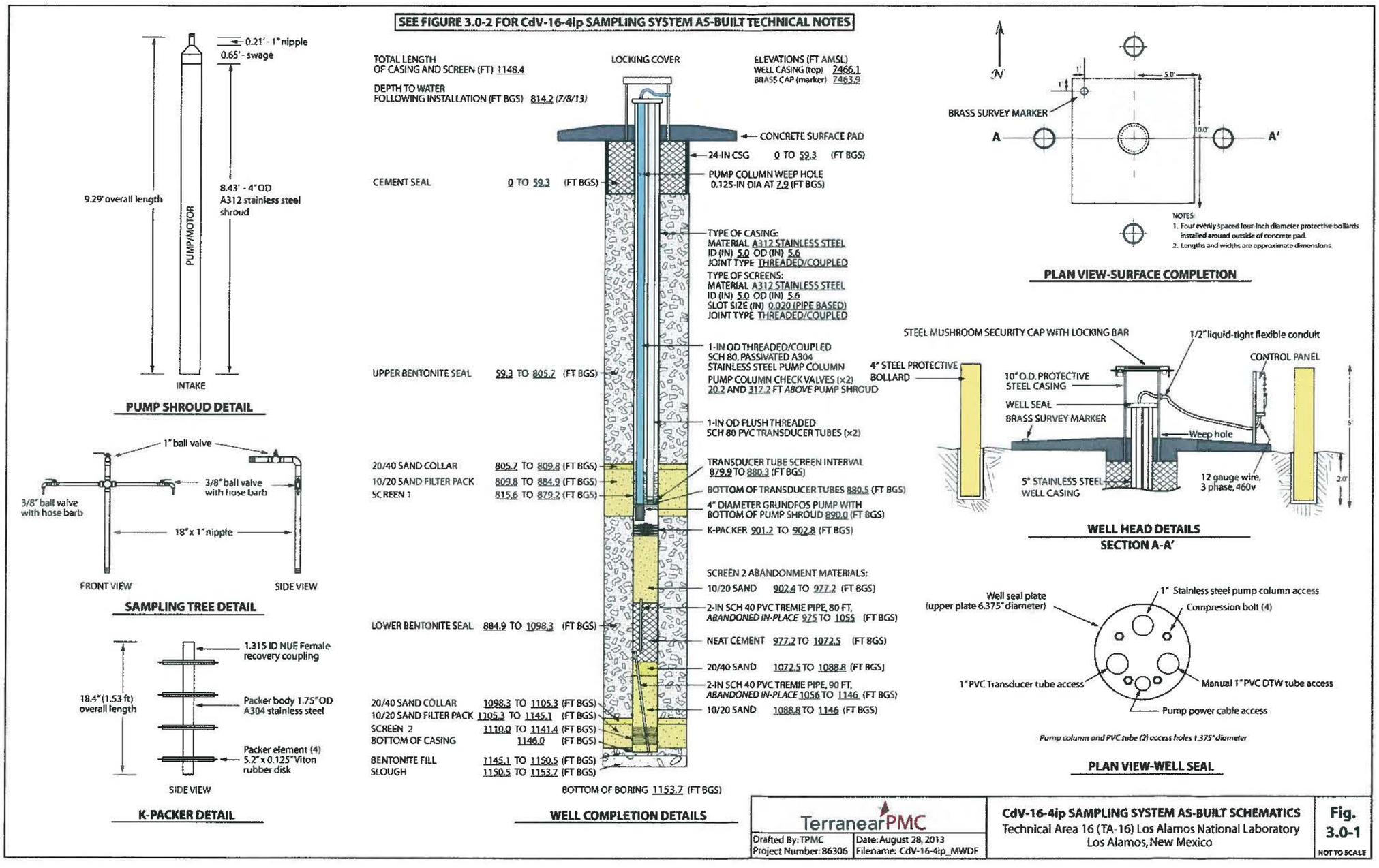
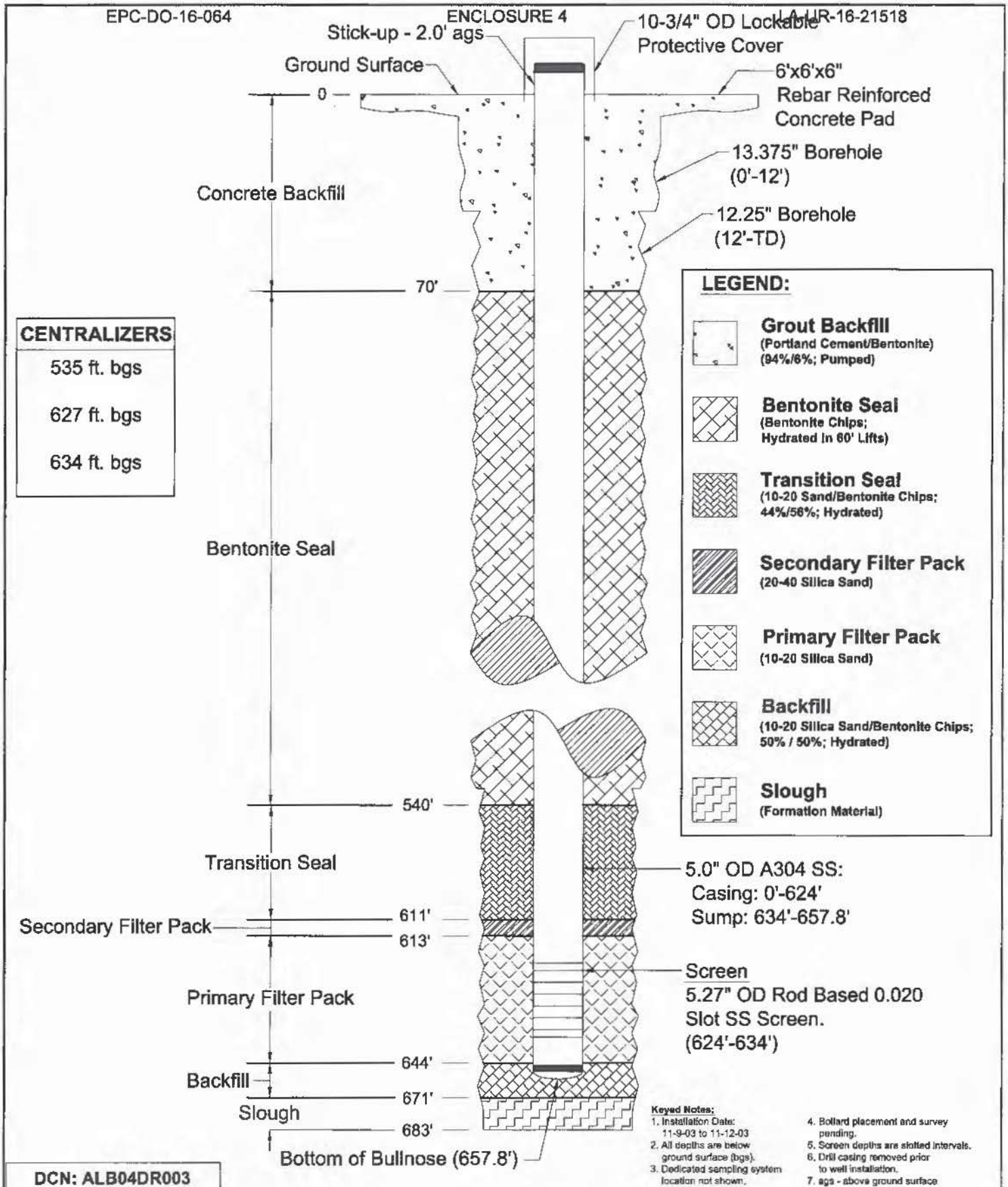


Figure 3.0-1 As-built schematics of monitoring well CdV-16-4ip sampling system



CENTRALIZERS
535 ft. bgs
627 ft. bgs
634 ft. bgs

LEGEND:

- **Grout Backfill** (Portland Cement/Bentonite) (94%/6%; Pumped)
- **Bentonite Seal** (Bentonite Chips; Hydrated in 60' Lifts)
- **Transition Seal** (10-20 Sand/Bentonite Chips; 44%/56%; Hydrated)
- **Secondary Filter Pack** (20-40 Silica Sand)
- **Primary Filter Pack** (10-20 Silica Sand)
- **Backfill** (10-20 Silica Sand/Bentonite Chips; 50% / 50%; Hydrated)
- **Slough** (Formation Material)

Keyed Notes:

1. Installation Date: 11-9-03 to 11-12-03
2. All depths are below ground surface (bgs).
3. Dedicated sampling system location not shown.
4. Bollard placement and survey pending.
5. Screen depths are slotted intervals.
6. Drill casing removed prior to well installation.
7. ags - above ground surface

DCN: ALB04DR003

KLEINFELDER

Drawn By: C. London	Date: March 2004
Project No.: 37151	Filename: Figure 1
Scale: Not-To-Scale	Revision: 0
Reviewed By: F. Schelby	Approved By: M. Everett

Schematic Diagram of As Built Well CdV-16-1(i)
Los Alamos National Laboratory
Los Alamos, New Mexico

FIGURE **1**

ENCLOSURE 5

Analytical Data

ENV-DO-16-064

LA-UR-16-21518

U1501760

Date: MAR 2 2 2016

Frequency of Detections for analytes in untreated water from CdV-16-4ip, CdV-9-1(i) and CdV-16-1(i), based on samples collected in 2014 and 2015

FD table

event	location of max result	Field preparation code	RFI Class	Analyte	Units	Number of Analyses	Number of Detects	Min	Avg	Max	Human Health	Number Greater than HH	Other DWS	Number Greater than Other DWS	Irrigation	Number greater than Irrigation	NMED Table A-1 Tap Water
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Aluminum	ug/L	4	0	—	—	—	—	—	—	—	5000	—	19900
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Antimony	ug/L	4	0	—	—	—	—	—	—	—	—	—	7.26
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Arsenic	ug/L	4	0	—	—	—	100	—	—	—	—	—	0.513
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Barium	ug/L	4	4	16	16.8	17.6	1000	0	—	0	—	0	3280
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Beryllium	ug/L	4	0	—	—	—	—	—	—	—	—	—	12.4
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Boron	ug/L	4	4	61.7	69.55	75.9	—	0	—	0	750	0	3950
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Cadmium	ug/L	4	0	—	—	—	10	—	—	—	—	—	6.24
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Chromium	ug/L	4	0	—	—	—	50	—	—	—	—	—	13600
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Copper	ug/L	4	4	8.88	15.82	24.8	—	0	1000	0	—	0	790
4559; 9203; 10484	CdV-16-1(i)	UF	INORGANIC	Cyanide (Total)	mg/L	3	0	—	—	—	—	—	—	—	—	—	0.00146
4559; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Fluoride	mg/L	3	3	0.0428	0.0548	0.068	—	0	—	0	—	0	1.18
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Iron	ug/L	4	0	—	—	—	—	—	1000	—	—	—	13800
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Lead	ug/L	4	0	—	—	—	50	—	—	—	—	—	—
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Manganese	ug/L	4	4	2.41	4.86	7.96	—	0	200	0	—	0	2020
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Mercury	ug/L	4	0	—	—	—	2	—	—	—	—	—	0.626
4559; 5771; 9203; 10484	CdV-16-1(i)	UF	INORGANIC	Mercury	ug/L	4	0	—	—	—	2	—	—	—	—	—	0.626
4559; 9203; 10484; 5771	CdV-16-1(i)	F	INORGANIC	Molybdenum	ug/L	4	3	0.59	0.686	0.861	—	0	—	0	1000	0	98.7
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Nickel	ug/L	4	4	2.36	3.93	6.06	—	0	—	0	200	0	372
4559; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Perchlorate	ug/L	3	3	0.505	0.523333333	0.536	—	0	—	0	—	0	13.8
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Selenium	ug/L	4	0	—	—	—	50	—	—	—	—	—	98.7
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Silver	ug/L	4	0	—	—	—	50	—	—	—	—	—	81.2
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Strontium	ug/L	4	4	92.4	95.2	97.9	—	0	—	0	—	0	11800
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Thallium	ug/L	4	0	—	—	—	—	—	—	—	—	—	0.197
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Uranium	ug/L	4	4	0.325	0.3875	0.473	30	0	—	0	—	0	59.2
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Vanadium	ug/L	4	4	1.96	2.48	3.03	—	0	—	0	—	0	63.1
4559; 5771; 9203; 10484	CdV-16-1(i)	F	INORGANIC	Zinc	ug/L	4	4	22.5	41.475	70.7	—	0	10000	0	—	0	5960
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Acenaphthene	ug/L	3	0	—	—	—	—	—	—	—	—	—	535
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Acetone	ug/L	4	0	—	—	—	—	—	—	—	—	—	14100
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Acrolein	ug/L	4	0	—	—	—	—	—	—	—	—	—	0.0415
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Acrylonitrile	ug/L	4	0	—	—	—	—	—	—	—	—	—	0.523
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Anthracene	ug/L	3	0	—	—	—	—	—	—	—	—	—	1720
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Benzene	ug/L	4	0	—	—	—	10	—	—	—	—	—	4.54
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Benzidine	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.00107
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Benzo(a)anthracene	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.343
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Benzo(a)pyrene	ug/L	3	0	—	—	—	0.7	—	—	—	—	—	0.0343
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Benzo(b)fluoranthene	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.343
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Benzo(k)fluoranthene	ug/L	3	0	—	—	—	—	—	—	—	—	—	3.43
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Bis(2-chloroethyl)ether	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.136
5695; 4559; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Acetone	ug/L	7	1	2.54	2.54	2.54	—	0	—	0	—	0	14100
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Bromodichloromethane	ug/L	4	0	—	—	—	—	—	—	—	—	—	1.34
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Bromoform	ug/L	4	0	—	—	—	—	—	—	—	—	—	91.9
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Bromomethane	ug/L	4	0	—	—	—	—	—	—	—	—	—	8
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Butanone[2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	5560
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Carbon Disulfide	ug/L	4	0	—	—	—	—	—	—	—	—	—	810
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Carbon Tetrachloride	ug/L	4	0	—	—	—	10	—	—	—	—	—	4.53
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Chloro-1,3-butadiene[2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	0.187
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Chlorobenzene	ug/L	4	0	—	—	—	—	—	—	—	—	—	77.6
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Chlorodibromomethane	ug/L	4	0	—	—	—	—	—	—	—	—	—	1.68

ENCLOSURE 5

Detections in composite sample of development water from CdV-9-1(i), 03/26/15

Location	COC	Sample	Collection Date	Fld Prep	Fld Matrix	Fld QC Type	Method	CAS	Analyte	Detect Flag	Result	Units	Lab Qual	Val Qual	Val Reason	Lab	1-s TPU	MDA	MDL	PQL	DF	Sample Usage
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	EPA:150.1	pH	Acidity or Alkalinity of a solution	Y	8.16	SU	H	NQ	NQ	GELC			0.01	0.1	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:150.1	pH	Acidity or Alkalinity of a solution	Y	8.31	SU	H	NQ	NQ	GELC			0.01	0.1	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	EPA:310.1	LK-CO3+HCO	Alkalinity-CO3+HCO3	Y	74.2	mg/L		NQ	NQ	GELC			0.725	2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:310.1	LK-CO3+HCO	Alkalinity-CO3+HCO3	Y	73.7	mg/L		NQ	NQ	GELC			0.725	2	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	Al	Aluminum	Y	1710	ug/L	N	NQ	NQ	GELC			68	200	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	Al	Aluminum	Y	8280	ug/L	N	NQ	NQ	GELC			68	200	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:8321A_MOD	19406-51-0	Amino-2,6-dinitrotoluene[4-]	Y	3.74	ug/L		NQ	NQ	GELC			0.32	1	2	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:8321A_MOD	35572-78-2	Amino-4,6-dinitrotoluene[2-]	Y	0.668	ug/L	J	J	J_LAB	GELC			0.32	1	2	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6020	Sb	Antimony	Y	1.59	ug/L	J	J	J_LAB	GELC			1	3	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6020	Sb	Antimony	Y	1.1	ug/L	J	J	J_LAB	GELC			1	3	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6020	As	Arsenic	Y	2.12	ug/L	J	J	J_LAB	GELC			1.7	5	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6020	As	Arsenic	Y	2.49	ug/L	J	J	J_LAB	GELC			1.7	5	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	Ba	Barium	Y	19.4	ug/L		NQ	NQ	GELC			1	5	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	Ba	Barium	Y	48	ug/L		NQ	NQ	GELC			1	5	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	B	Boron	Y	112	ug/L		NQ	NQ	GELC			15	50	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	B	Boron	Y	134	ug/L		NQ	NQ	GELC			15	50	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	EPA:300.0	Br(-1)	Bromide	Y	0.0738	mg/L	J	J	J_LAB	GELC			0.067	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:300.0	Br(-1)	Bromide	Y	0.0867	mg/L	J	J	J_LAB	GELC			0.067	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:8260B	78-93-3	Butanone[2-]	Y	3.42	ug/L	J	J-	V9	GELC			2	5	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	Ca	Calcium	Y	1.33	mg/L		NQ	NQ	GELC			0.05	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	Ca	Calcium	Y	5.49	mg/L		NQ	NQ	GELC			0.05	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	EPA:300.0	Cl(-1)	Chloride	Y	6.07	mg/L		NQ	NQ	GELC			0.067	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:300.0	Cl(-1)	Chloride	Y	6.09	mg/L		NQ	NQ	GELC			0.067	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:8260B	541-73-1	Dichlorobenzene[1,3-]	Y	0.63	ug/L	J	J-	V9	GELC			0.3	1	1	WST_PURG
WST-600902	2015-955	WST09-15-95411	03/26/15	UF	W	FD	SW-846:8260B	541-73-1	Dichlorobenzene[1,3-]	Y	0.43	ug/L	J	J-	V9	GELC			0.3	1	1	QC
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	EPA:300.0	F(-1)	Fluoride	Y	0.163	mg/L		NQ	NQ	GELC			0.033	0.1	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:300.0	F(-1)	Fluoride	Y	0.161	mg/L		NQ	NQ	GELC			0.033	0.1	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:900	GROSSA	Gross alpha	Y	26.9	pCi/L		NQ	NQ	GELC	1.8	3.59			1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:900	GROSSB	Gross beta	Y	8.46	pCi/L		NQ	NQ	GELC	0.667	1.69			1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SM:A2340B	HARDNESS	Hardness	Y	5.45	mg/L		NQ	NQ	GELC			0.453	1.24	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SM:A2340B	HARDNESS	Hardness	Y	23.8	mg/L		NQ	NQ	GELC			0.453	1.24	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:8321A_MOD	2691-41-0	HMX	Y	19.2	ug/L		NQ	NQ	GELC			0.32	1	2	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	Fe	Iron	Y	757	ug/L		NQ	NQ	GELC			30	100	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	Fe	Iron	Y	3400	ug/L		NQ	NQ	GELC			30	100	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6020	Pb	Lead	Y	3.12	ug/L		NQ	NQ	GELC			0.5	2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6020	Pb	Lead	Y	9.68	ug/L		NQ	NQ	GELC			0.5	2	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	Mg	Magnesium	Y	0.519	mg/L		NQ	NQ	GELC			0.11	0.3	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	Mg	Magnesium	Y	2.41	mg/L		NQ	NQ	GELC			0.11	0.3	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	Mn	Manganese	Y	8.45	ug/L	J	J	J_LAB	GELC			2	10	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	Mn	Manganese	Y	30.1	ug/L		NQ	NQ	GELC			2	10	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:8260B	1634-04-4	Methyl tert-Butyl Ether	Y	0.99	ug/L	J	J-	V9	GELC			0.3	1	1	WST_PURG
WST-600902	2015-955	WST09-15-95411	03/26/15	UF	W	FD	SW-846:8260B	1634-04-4	Methyl tert-Butyl Ether	Y	1.08	ug/L		J-	V9	GELC			0.3	1	1	QC
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6020	Mo	Molybdenum	Y	9.24	ug/L		NQ	NQ	GELC			0.165	0.5	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6020	Mo	Molybdenum	Y	8.04	ug/L		NQ	NQ	GELC			0.165	0.5	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6020	Ni	Nickel	Y	0.554	ug/L	J	J	J_LAB	GELC			0.5	2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6020	Ni	Nickel	Y	1.38	ug/L	J	J	J_LAB	GELC			0.5	2	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	EPA:353.2	NO3+NO2-N	Nitrate-Nitrite as Nitrogen	Y	1.11	mg/L		NQ	NQ	GELC			0.085	0.25	5	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:353.2	NO3+NO2-N	Nitrate-Nitrite as Nitrogen	Y	1.17	mg/L		NQ	NQ	GELC			0.085	0.25	5	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:8321A_MOD	88-72-2	Nitrotoluene[2-]	Y	0.504	ug/L	J	J	J_LAB	GELC			0.328	1	2	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:1664A	OIL_GREASE	Oil and Grease	Y	2270	ug/L	JR	J	J_LAB	GELC			1510	5410	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6850	ClO4	Perchlorate	Y	0.391	ug/L		NQ	NQ	GELC			0.05	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6850	ClO4	Perchlorate	Y	0.435	ug/L		NQ	NQ	GELC			0.05	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	K	Potassium	Y	0.0917	mg/L	J	J	J_LAB	GELC			0.05	0.15	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	K	Potassium	Y	0.437	mg/L		NQ	NQ	GELC			0.05	0.15	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:903.1	Ra-226	Radium-226	Y	1.01	pCi/L		J	R10,R33	GELC	0.267	0.68			1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:904	Ra-228	Radium-228	Y	6.17	pCi/L		NQ	NQ,R33	GELC	1.1	3.19			1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:8321A_MOD	121-82-4	RDX	Y	242	ug/L		NQ	NQ	GELC			3.2	10	20	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	SiO2	Silicon Dioxide	Y	53.5	mg/L		NQ	NQ	GELC			0.53	2.13	10	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	SiO2	Silicon Dioxide	Y	88.3	mg/L		NQ	NQ	GELC			0.53	2.13	10	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	Na	Sodium	Y	43	mg/L		NQ	NQ	GELC			0.1	0.3	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	Na	Sodium	Y	48.6	mg/L		NQ	NQ	GELC			0.1	0.3	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	EPA:120.1	SPEC_COND	Specific Conductance	Y	177	uS/cm		NQ	NQ	GELC			3.63	14.5	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:120.1	SPEC_COND	Specific Conductance	Y	180	uS/cm		NQ	NQ	GELC			3.63	14.5	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	Sr	Strontium	Y	18.7	ug/L		NQ	NQ	GELC			1	5	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	Sr	Strontium	Y	74.9	ug/L		NQ	NQ	GELC			1	5	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	EPA:300.0	SO4(-2)	Sulfate	Y	7.22	mg/L		NQ	NQ	GELC			0.133	0.4	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:300.0	SO4(-2)	Sulfate	Y	7.23	mg/L		NQ	NQ	GELC			0.133	0.4	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	HASL-300:ISOTH	Th-228	Thorium-228	Y	1.27	pCi/L		NQ	NQ	GELC	0.048	0.05			1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	HASL-300:ISOTH	Th-230	Thorium-230	Y	2.45	pCi/L		NQ	NQ,R33	GELC	0.0666	0.07			1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	HASL-300:ISOTH	Th-232	Thorium-232	Y	2.61	pCi/L		NQ	NQ	GELC	0.0683	0.03			1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	EPA:160.1	TDS	Total Dissolved Solids	Y	116	mg/L		NQ	NQ	GELC			3.4	14.3	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:160.1	TDS	Total Dissolved Solids	Y	460	mg/L		NQ	NQ	GELC			11.9	50	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	EPA:160.2	TSS	Total Suspended Solids	Y	986	mg/L		NQ	NQ	GELC			11.4	50	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6020	U	Uranium	Y	3.29	ug/L		NQ	NQ	GELC			0.067	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6020	U	Uranium	Y	7.71	ug/L		NQ	NQ	GELC			0.067	0.2	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	V	Vanadium	Y	3.32	ug/L	J	J	J_LAB	GELC			1	5	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	V	Vanadium	Y	4.56	ug/L	J	J	J_LAB	GELC			1	5	1	WST_PURG
WST-600902	2015-955	WST09-15-95409	03/26/15	F	W	WST	SW-846:6010C	Zn	Zinc	Y	11.8	ug/L		J	I10a	GELC			3.3	10	1	WST_PURG
WST-600902	2015-955	WST09-15-95410	03/26/15	UF	W	WST	SW-846:6010C	Zn	Zinc	Y	24.4	ug/L		NQ	NQ	GELC			3.3	10	1	WST_PURG

Frequency of Detections for analytes in untreated water from CdV-16-4ip, CdV-9-1(i) and CdV-16-1(i), based on samples collected in 2014 and 2015

event	location of max result	Field preparation code	RFI Class	Analyte	Units	Number of Analyses	Number of Detects	Min	Avg	Max	Human Health	Number Greater than HH	Other DWS	Number Greater than Other DWS	Irrigation	Number greater than Irrigation	NMED Table A-1 Tap Water
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Chloroethane	ug/L	4	0	—	—	—	—	—	—	—	—	—	20900
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Chloroform	ug/L	4	0	—	—	—	100	—	—	—	—	—	2.29
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Chloromethane	ug/L	4	0	—	—	—	—	—	—	—	—	—	20.3
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Chloronaphthalene[2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	733
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Chlorophenol[2-]	ug/L	2	0	—	—	—	—	—	—	—	—	—	91
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Chlorotoluene[2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	233
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Chrysene	ug/L	3	0	—	—	—	—	—	—	—	—	—	34.3
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Dibenz(a,h)anthracene	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.106
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dibromo-3-Chloropropane[1,2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	0.00336
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dibromoethane[1,2-]	ug/L	4	0	—	—	—	0.1	—	—	—	—	—	0.0746
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dichlorobenzene[1,2-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	302
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dichlorobenzene[1,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	4.81
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Dichlorobenzidine[3,3'-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	1.24
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dichlorodifluoromethane	ug/L	4	0	—	—	—	—	—	—	—	—	—	197
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dichloroethane[1,1-]	ug/L	4	0	—	—	—	25	—	—	—	—	—	27.5
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dichloroethane[1,2-]	ug/L	4	0	—	—	—	10	—	—	—	—	—	1.71
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dichloroethene[1,1-]	ug/L	4	0	—	—	—	5	—	—	—	—	—	284
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dichloroethene[cis-1,2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	36.5
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dichloroethene[trans-1,2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	93.2
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Dichlorophenol[2,4-]	ug/L	2	0	—	—	—	—	—	—	—	—	—	45.3
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Dichloropropane[1,2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	4.37
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Diethyl Ether	ug/L	4	0	—	—	—	—	—	—	—	—	—	3930
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Diethylphthalate	ug/L	2	0	—	—	—	—	—	—	—	—	—	14800
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Dimethylphenol[2,4-]	ug/L	2	0	—	—	—	—	—	—	—	—	—	354
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Di-n-butylphthalate	ug/L	2	0	—	—	—	—	—	—	—	—	—	885
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Dinitro-2-methylphenol[4,6-]	ug/L	2	0	—	—	—	—	—	—	—	—	—	1.51
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Dinitrophenol[2,4-]	ug/L	2	0	—	—	—	—	—	—	—	—	—	38.8
4559; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	Dinitrotoluene[2,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	2.37
4559; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	Dinitrotoluene[2,6-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	0.484
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Dioxane[1,4-]	ug/L	2	0	—	—	—	—	—	—	—	—	—	7.76
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Ethyl Methacrylate	ug/L	4	0	—	—	—	—	—	—	—	—	—	455
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Ethylbenzene	ug/L	4	0	—	—	—	750	—	—	—	—	—	14.9
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Fluoranthene	ug/L	3	0	—	—	—	—	—	—	—	—	—	802
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Fluorene	ug/L	3	0	—	—	—	—	—	—	—	—	—	288
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Hexachlorobenzene	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.487
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Hexachlorobutadiene	ug/L	6	0	—	—	—	—	—	—	—	—	—	2.95
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Hexachlorocyclopentadiene	ug/L	2	0	—	—	—	—	—	—	—	—	—	27.8
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Hexachloroethane	ug/L	2	0	—	—	—	—	—	—	—	—	—	6.8
10278; 9203	CDV-9-1(i)	UF	ORGANIC	Acetone	ug/L	3	1	18.5	18.5	18.5	—	0	—	0	—	0	14100
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Indeno(1,2,3-cd)pyrene	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.343
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Isobutyl alcohol	ug/L	4	0	—	—	—	—	—	—	—	—	—	5910
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Isophorone	ug/L	2	0	—	—	—	—	—	—	—	—	—	779
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Isopropylbenzene	ug/L	4	0	—	—	—	—	—	—	—	—	—	447
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Methacrylonitrile	ug/L	4	0	—	—	—	—	—	—	—	—	—	1.91
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Methyl Methacrylate	ug/L	4	0	—	—	—	—	—	—	—	—	—	1390
9203; 4559	CdV-16-1(i)	UF	ORGANIC	Bis(2-ethylhexyl)phthalate	ug/L	2	1	4.39	4.39	4.39	—	0	—	0	—	0	55.6
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Methyl-2-pentanone[4-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	1240
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Methylene Chloride	ug/L	4	0	—	—	—	100	—	—	—	—	—	106
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Naphthalene	ug/L	7	0	—	—	—	—	—	—	—	—	—	1.65

Frequency of Detections for analytes in untreated water from CdV-16-4ip, CdV-9-1(i) and CdV-16-1(i), based on samples collected in 2014 and 2015

event	location of max result	Field preparation code	RFI Class	Analyte	Units	Number of Analyses	Number of Detects	Min	Avg	Max	Human Health	Number Greater than HH	Other DWS	Number Greater than Other DWS	Irrigation	Number greater than Irrigation	NMED Table A-1 Tap Water
4559; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	Nitrobenzene	ug/L	6	0	—	—	—	—	—	—	—	—	—	1.4
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Nitrosodimethylamine[N-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.00165
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Nitroso-di-n-butylamine[N-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.0272
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Nitrosopyrrolidine[N-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.37
4559; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	Nitrotoluene[2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	3.13
4559; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	Nitrotoluene[3-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	1.74
4559; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	Nitrotoluene[4-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	42.4
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Pentachlorobenzene	ug/L	2	0	—	—	—	—	—	—	—	—	—	3.07
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Pentachlorophenol	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.4
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Phenanthrene	ug/L	3	0	—	—	—	—	—	—	—	—	—	170
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Phenol	ug/L	2	0	—	—	—	—	—	—	—	—	—	5760
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Pyrene	ug/L	3	0	—	—	—	—	—	—	—	—	—	117
4559; 5771; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	HMX	ug/L	5	5	1.43	1.586	1.7	—	0	—	0	—	0	1000
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Styrene	ug/L	4	0	—	—	—	—	—	—	—	—	—	1210
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Tetrachlorobenzene[1,2,4,5]	ug/L	2	0	—	—	—	—	—	—	—	—	—	1.66
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Tetrachloroethane[1,1,1,2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	5.72
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Tetrachloroethane[1,1,2,2-]	ug/L	4	0	—	—	—	10	—	—	—	—	—	0.757
4559; 5695; 5771; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	HMX	ug/L	9	9	6.33	8.047777778	9.94	—	0	—	0	—	0	1000
4559; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	Tetryl	ug/L	4	0	—	—	—	—	—	—	—	—	—	39.4
9203; 10278	CDV-9-1(i)	UF	ORGANIC	HMX	ug/L	3	3	2.42	3.146666667	3.56	—	0	—	0	—	0	1000
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Trichloro-1,2,2-trifluoroethane[1,1,2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	55000
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Trichlorobenzene[1,2,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	3.98
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Trichloroethane[1,1,1-]	ug/L	4	0	—	—	—	60	—	—	—	—	—	8000
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Trichloroethane[1,1,2-]	ug/L	4	0	—	—	—	10	—	—	—	—	—	0.415
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Trichloroethene	ug/L	4	0	—	—	—	100	—	—	—	—	—	2.82
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Trichlorofluoromethane	ug/L	4	0	—	—	—	—	—	—	—	—	—	1140
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Trichlorophenol[2,4,5-]	ug/L	2	0	—	—	—	—	—	—	—	—	—	1170
4559; 9203	CdV-16-1(i)	UF	ORGANIC	Trichlorophenol[2,4,6-]	ug/L	2	0	—	—	—	—	—	—	—	—	—	11.9
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Trichloropropane[1,2,3-]	ug/L	5	0	—	—	—	—	—	—	—	—	—	0.00747
4559; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	Trinitrotoluene[2,4,6-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	9.8
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Vinyl acetate	ug/L	4	0	—	—	—	—	—	—	—	—	—	409
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Vinyl Chloride	ug/L	4	0	—	—	—	1	—	—	—	—	—	0.201
4559; 5771; 9203; 10278	CdV-16-1(i)	UF	ORGANIC	Xylene[1,2-]	ug/L	4	0	—	—	—	—	—	—	—	—	—	193
4559; 5695; 5771; 7044; 10484	CdV-16-1(i)	F	INORGANIC	Aluminum	ug/L	8	0	—	—	—	—	—	—	—	5000	—	19900
4559; 5695; 5771; 7044; 10484	CdV-16-1(i)	F	INORGANIC	Antimony	ug/L	8	0	—	—	—	—	—	—	—	—	—	7.26
4559; 5695; 5771; 7044; 10484	CdV-16-1(i)	F	INORGANIC	Arsenic	ug/L	8	0	—	—	—	100	—	—	—	—	—	0.513
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Barium	ug/L	8	8	2.73	3.01	3.3	1000	0	—	0	—	0	3280
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Beryllium	ug/L	8	0	—	—	—	—	—	—	—	—	—	12.4
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Boron	ug/L	8	8	62.4	63.7125	67.1	—	0	—	0	750	0	3950
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Cadmium	ug/L	8	0	—	—	—	10	—	—	—	—	—	6.24
5771; 4559; 5695; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Chromium	ug/L	8	1	2.73	2.73	2.73	50	0	—	0	—	0	13600
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Copper	ug/L	8	0	—	—	—	—	—	1000	—	—	—	790
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	UF	INORGANIC	Cyanide (Total)	mg/L	8	0	—	—	—	—	—	—	—	—	—	0.00146
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Fluoride	mg/L	8	8	0.0675	0.0818	0.093	—	0	—	0	—	0	1.18
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Iron	ug/L	8	1	33.9	33.9	33.9	—	0	1000	0	—	0	13800
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Lead	ug/L	8	0	—	—	—	50	—	—	—	—	—	—
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Manganese	ug/L	8	0	—	—	—	—	—	200	—	—	—	2020
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Mercury	ug/L	8	0	—	—	—	2	—	—	—	—	—	0.626
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	UF	INORGANIC	Mercury	ug/L	8	0	—	—	—	2	—	—	—	—	—	0.626

Frequency of Detections for analytes in untreated water from CdV-16-4ip, CdV-9-1(i) and CdV-16-1(i), based on samples collected in 2014 and 2015

event	location of max result	Field preparation code	RFI Class	Analyte	Units	Number of Analyses	Number of Detects	Min	Avg	Max	Human Health	Number Greater than HH	Other DWS	Number Greater than Other DWS	Irrigation	Number greater than Irrigation	NMED Table A-1 Tap Water
5695; 5771; 7044; 10484; 4559	CDV-16-4ip S1	F	INORGANIC	Molybdenum	ug/L	8	6	0.45	0.570333333	0.637	—	0	—	0	1000	0	98.7
5695; 5771; 7044; 10484; 4559	CDV-16-4ip S1	F	INORGANIC	Nickel	ug/L	8	6	0.526	0.619833333	0.727	—	0	—	0	200	0	372
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Perchlorate	ug/L	8	8	0.337	0.360375	0.397	—	0	—	0	—	0	13.8
4559; 5695; 5771; 7044; 10484	*CDV-16-4ip S1*	*F*	*INORGANIC*	*Selenium*	*ug/L*	*8*	*0*	—	—	—	*50*	—	—	—	—	—	*98.7*
4559; 5695; 5771; 7044; 10484	*CDV-16-4ip S1*	*F*	*INORGANIC*	*Silver*	*ug/L*	*8*	*0*	—	—	—	*50*	—	—	—	—	—	*81.2*
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Strontium	ug/L	8	8	55.9	60.4875	65.8	—	0	—	0	—	0	11800
4559; 5695; 5771; 7044; 10484	*CDV-16-4ip S1*	*F*	*INORGANIC*	*Thallium*	*ug/L*	*8*	*0*	—	—	—	—	—	—	—	—	—	*0.197*
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Uranium	ug/L	8	8	0.423	0.467625	0.516	30	0	—	0	—	0	59.2
4559; 5695; 5771; 7044; 10484	CDV-16-4ip S1	F	INORGANIC	Vanadium	ug/L	8	8	1.52	2.40125	2.87	—	0	—	0	—	0	63.1
4559; 5695; 5771; 7044; 10484	*CDV-16-4ip S1*	*F*	*INORGANIC*	*Zinc*	*ug/L*	*8*	*0*	—	—	—	—	—	*10000*	—	—	—	*5960*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Acenaphthene*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*535*
9203; 10278; 4559; 5771	CdV-16-1(i)	UF	ORGANIC	Methyl tert-Butyl Ether	ug/L	4	2	1.19	1.23	1.27	—	0	—	0	—	0	143
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Acrolein*	*ug/L*	*8*	*0*	—	—	—	—	—	—	—	—	—	*0.0415*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Acrylonitrile*	*ug/L*	*8*	*0*	—	—	—	—	—	—	—	—	—	*0.523*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Anthracene*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*1720*
4559; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Aroclor-1016*	*ug/L*	*3*	*0*	—	—	—	—	—	—	—	—	—	*1.4*
4559; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Aroclor-1221*	*ug/L*	*3*	*0*	—	—	—	—	—	—	—	—	—	*0.0554*
4559; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Aroclor-1232*	*ug/L*	*3*	*0*	—	—	—	—	—	—	—	—	—	*0.0554*
4559; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Aroclor-1242*	*ug/L*	*3*	*0*	—	—	—	—	—	—	—	—	—	*0.389*
4559; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Aroclor-1248*	*ug/L*	*3*	*0*	—	—	—	—	—	—	—	—	—	*0.389*
4559; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Aroclor-1254*	*ug/L*	*3*	*0*	—	—	—	—	—	—	—	—	—	*0.389*
4559; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Aroclor-1260*	*ug/L*	*3*	*0*	—	—	—	—	—	—	—	—	—	*0.389*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Benzene*	*ug/L*	*7*	*0*	—	—	—	*10*	—	—	—	—	—	*4.54*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Benzidine*	*ug/L*	*8*	*0*	—	—	—	—	—	—	—	—	—	*0.00107*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Benzo(a)anthracene*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*0.343*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Benzo(a)pyrene*	*ug/L*	*6*	*0*	—	—	—	*0.7*	—	—	—	—	—	*0.0343*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Benzo(b)fluoranthene*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*0.343*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Benzo(k)fluoranthene*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*3.43*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Bis(2-chloroethyl)ether*	*ug/L*	*8*	*0*	—	—	—	—	—	—	—	—	—	*0.136*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Bis(2-ethylhexyl)phthalate*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*55.6*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Bromodichloromethane*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*1.34*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Bromoform*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*91.9*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Bromomethane*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*8*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Butanone[2-]*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*5560*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Carbon Disulfide*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*810*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Carbon Tetrachloride*	*ug/L*	*7*	*0*	—	—	—	*10*	—	—	—	—	—	*4.53*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chloro-1,3-butadiene[2-]*	*ug/L*	*8*	*0*	—	—	—	—	—	—	—	—	—	*0.187*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chlorobenzene*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*77.6*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chlorodibromomethane*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*1.68*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chloroethane*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*20900*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chloroform*	*ug/L*	*7*	*0*	—	—	—	*100*	—	—	—	—	—	*2.29*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chloromethane*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*20.3*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chloronaphthalene[2-]*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*733*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chlorophenol[2-]*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*91*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chlorotoluene[2-]*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*233*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Chrysene*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*34.3*
4559; 5695; 5771; 7044	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Dibenz(a,h)anthracene*	*ug/L*	*6*	*0*	—	—	—	—	—	—	—	—	—	*0.106*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Dibromo-3-Chloropropane[1,2-]*	*ug/L*	*7*	*0*	—	—	—	—	—	—	—	—	—	*0.00336*
4559; 5695; 5771; 7044; 10278	*CDV-16-4ip S1*	*UF*	*ORGANIC*	*Dibromoethane[1,2-]*	*ug/L*	*7*	*0*	—	—	—	*0.1*	—	—	—	—	—	*0.0746*

Frequency of Detections for analytes in untreated water from CdV-16-4ip, CdV-9-1(i) and CdV-16-1(i), based on samples collected in 2014 and 2015

event	location of max result	Field preparation code	RFI Class	Analyte	Units	Number of Analyses	Number of Detects	Min	Avg	Max	Human Health	Number Greater than HH	Other DWS	Number Greater than Other DWS	Irrigation	Number greater than Irrigation	NMED Table A-1 Tap Water
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Dichlorobenzene[1,2-]	ug/L	13	0	—	—	—	—	—	—	—	—	—	302
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Dichlorobenzene[1,4-]	ug/L	13	0	—	—	—	—	—	—	—	—	—	4.81
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Dichlorobenzidine[3,3'-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	1.24
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Dichlorodifluoromethane	ug/L	7	0	—	—	—	—	—	—	—	—	—	197
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Dichloroethane[1,1-]	ug/L	7	0	—	—	—	25	—	—	—	—	—	27.5
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Dichloroethane[1,2-]	ug/L	7	0	—	—	—	10	—	—	—	—	—	1.71
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Dichloroethene[1,1-]	ug/L	7	0	—	—	—	5	—	—	—	—	—	284
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Dichloroethene[cis-1,2-]	ug/L	7	0	—	—	—	—	—	—	—	—	—	36.5
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Dichloroethene[trans-1,2-]	ug/L	7	0	—	—	—	—	—	—	—	—	—	93.2
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Dichlorophenol[2,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	45.3
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Dichloropropane[1,2-]	ug/L	7	0	—	—	—	—	—	—	—	—	—	4.37
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Diethyl Ether	ug/L	7	0	—	—	—	—	—	—	—	—	—	3930
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Diethylphthalate	ug/L	6	0	—	—	—	—	—	—	—	—	—	14800
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Dimethylphenol[2,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	354
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Di-n-butylphthalate	ug/L	6	0	—	—	—	—	—	—	—	—	—	885
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Dinitro-2-methylphenol[4,6-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	1.51
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Dinitrophenol[2,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	38.8
4559; 5695; 5771; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	Dinitrotoluene[2,4-]	ug/L	14	0	—	—	—	—	—	—	—	—	—	2.37
4559; 5695; 5771; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	Dinitrotoluene[2,6-]	ug/L	14	0	—	—	—	—	—	—	—	—	—	0.484
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Dioxane[1,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	7.76
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Ethyl Methacrylate	ug/L	7	0	—	—	—	—	—	—	—	—	—	455
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Ethylbenzene	ug/L	7	0	—	—	—	750	—	—	—	—	—	14.9
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Fluoranthene	ug/L	6	0	—	—	—	—	—	—	—	—	—	802
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Fluorene	ug/L	6	0	—	—	—	—	—	—	—	—	—	288
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Hexachlorobenzene	ug/L	7	0	—	—	—	—	—	—	—	—	—	0.487
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Hexachlorobutadiene	ug/L	13	0	—	—	—	—	—	—	—	—	—	2.95
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Hexachlorocyclopentadiene	ug/L	6	0	—	—	—	—	—	—	—	—	—	27.8
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Hexachloroethane	ug/L	6	0	—	—	—	—	—	—	—	—	—	6.6
4559; 5695; 7044; 10278; 5771	CDV-16-4ip S1	UF	ORGANIC	Methyl tert-Butyl Ether	ug/L	7	6	0.32	0.561666667	0.79	—	0	—	0	—	0	143
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Indeno(1,2,3-cd)pyrene	ug/L	6	0	—	—	—	—	—	—	—	—	—	0.343
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Isobutyl alcohol	ug/L	7	0	—	—	—	—	—	—	—	—	—	5910
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Isophorone	ug/L	6	0	—	—	—	—	—	—	—	—	—	779
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Isopropylbenzene	ug/L	7	0	—	—	—	—	—	—	—	—	—	447
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Methacrylonitrile	ug/L	8	0	—	—	—	—	—	—	—	—	—	1.91
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Methyl Methacrylate	ug/L	7	0	—	—	—	—	—	—	—	—	—	1390
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Methyl tert-Butyl Ether	ug/L	3	3	1.16	1.21	1.24	—	0	—	0	—	0	143
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Methyl-2-pentanone[4-]	ug/L	7	0	—	—	—	—	—	—	—	—	—	1240
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Methylene Chloride	ug/L	7	0	—	—	—	100	—	—	—	—	—	106
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Naphthalene	ug/L	13	0	—	—	—	—	—	—	—	—	—	1.65
4559; 5695; 5771; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	Nitrobenzene	ug/L	14	0	—	—	—	—	—	—	—	—	—	1.4
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Nitrosodimethylamine[N-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	0.00165
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Nitroso-di-n-butylamine[N-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	0.0272
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Nitrosopyrrolidine[N-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	0.37
4559; 5695; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	Nitrotoluene[2-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	3.13
4559; 5695; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	Nitrotoluene[3-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	1.74
4559; 5695; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	Nitrotoluene[4-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	42.4
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Pentachlorobenzene	ug/L	6	0	—	—	—	—	—	—	—	—	—	3.07
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Pentachlorophenol	ug/L	6	0	—	—	—	—	—	—	—	—	—	0.4
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Phenanthrene	ug/L	6	0	—	—	—	—	—	—	—	—	—	170

Frequency of Detections for analytes in untreated water from CdV-16-4ip, CdV-9-1(i) and CdV-16-1(i), based on samples collected in 2014 and 2015

event	location of max result	Field preparation code	RFI Class	Analyte	Units	Number of Analyses	Number of Detects	Min	Avg	Max	Human Health	Number Greater than HH	Other DWS	Number Greater than Other DWS	Irrigation	Number greater than Irrigation	NMED Table A-1 Tap Water
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Phenol	ug/L	6	0	—	—	—	—	—	—	—	—	—	5760
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Pyrene	ug/L	6	0	—	—	—	—	—	—	—	—	—	117
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Nitrotoluene[2-]	ug/L	3	2	0.0941	0.10855	0.119	—	0	—	0	—	0	3.13
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Styrene	ug/L	7	0	—	—	—	—	—	—	—	—	—	1210
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Tetrachlorobenzene[1,2,4,5]	ug/L	6	0	—	—	—	—	—	—	—	—	—	1.66
4559; 7044	CDV-16-4ip S1	UF	ORGANIC	Tetrachlorodibenzofuran[2,3,7,8-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	2.01E-06
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Tetrachloroethane[1,1,1,2-]	ug/L	7	0	—	—	—	—	—	—	—	—	—	5.72
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Tetrachloroethane[1,1,2,2-]	ug/L	7	0	—	—	—	10	—	—	—	—	—	0.757
4559; 5771; 9203; 10278; 10484	CdV-16-1(i)	UF	ORGANIC	RDX	ug/L	5	5	23.2	27.54	32.4	—	0	—	0	—	0	7.02
4559; 5695; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	Tetryl	ug/L	6	0	—	—	—	—	—	—	—	—	—	39.4
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Toluene	ug/L	7	0	—	—	—	750	—	—	—	—	—	1090
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Trichloro-1,2,2-trifluoroethane[1,1,2-]	ug/L	7	0	—	—	—	—	—	—	—	—	—	55000
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Trichlorobenzene[1,2,4-]	ug/L	13	0	—	—	—	—	—	—	—	—	—	3.98
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Trichloroethane[1,1,1-]	ug/L	7	0	—	—	—	60	—	—	—	—	—	8000
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Trichloroethane[1,1,2-]	ug/L	7	0	—	—	—	10	—	—	—	—	—	0.415
4559; 5695; 5771; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	RDX	ug/L	9	9	120	135.8888889	152	—	0	—	0	—	0	7.02
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Trichlorofluoromethane	ug/L	7	0	—	—	—	—	—	—	—	—	—	1140
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Trichlorophenol[2,4,5-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	1170
4559; 5695; 5771; 7044	CDV-16-4ip S1	UF	ORGANIC	Trichlorophenol[2,4,6-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	11.9
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Trichloropropane[1,2,3-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	0.00747
4559; 5695; 7044; 10278; 10484	CDV-16-4ip S1	UF	ORGANIC	Trinitrotoluene[2,4,6-]	ug/L	8	0	—	—	—	—	—	—	—	—	—	9.8
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Vinyl acetate	ug/L	7	0	—	—	—	—	—	—	—	—	—	409
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Vinyl Chloride	ug/L	7	0	—	—	—	1	—	—	—	—	—	0.201
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Xylene[1,2-]	ug/L	7	0	—	—	—	—	—	—	—	—	—	193
10278; 9203	CDV-9-1(i)	F	INORGANIC	Aluminum	ug/L	3	1	189	189	189	—	0	—	0	5000	0	19900
9203; 10278	CDV-9-1(i)	F	INORGANIC	Antimony	ug/L	3	0	—	—	—	—	—	—	—	—	—	7.26
9203; 10278	CDV-9-1(i)	F	INORGANIC	Arsenic	ug/L	3	0	—	—	—	100	—	—	—	—	—	0.513
9203; 10278	CDV-9-1(i)	F	INORGANIC	Barium	ug/L	3	3	2.94	3.28	3.96	1000	0	—	0	—	0	3280
9203; 10278	CDV-9-1(i)	F	INORGANIC	Beryllium	ug/L	3	0	—	—	—	—	—	—	—	—	—	12.4
9203; 10278	CDV-9-1(i)	F	INORGANIC	Boron	ug/L	3	3	50.5	51.33333333	52.4	—	0	—	0	750	0	3950
9203; 10278	CDV-9-1(i)	F	INORGANIC	Cadmium	ug/L	3	0	—	—	—	10	—	—	—	—	—	6.24
10278; 9203	CDV-9-1(i)	F	INORGANIC	Chromium	ug/L	3	1	2.18	2.18	2.18	50	0	—	0	—	0	13800
9203; 10278	CDV-9-1(i)	F	INORGANIC	Copper	ug/L	3	0	—	—	—	—	—	1000	—	—	—	790
9203; 10278	CDV-9-1(i)	UF	INORGANIC	Cyanide (Total)	mg/L	3	0	—	—	—	—	—	—	—	—	—	0.00146
9203; 10278	CDV-9-1(i)	F	INORGANIC	Fluoride	mg/L	3	3	0.101	0.104666667	0.11	—	0	—	0	—	0	1.18
10278; 9203	CDV-9-1(i)	F	INORGANIC	Iron	ug/L	3	1	126	126	126	—	0	1000	0	—	0	13800
9203; 10278	CDV-9-1(i)	F	INORGANIC	Lead	ug/L	3	0	—	—	—	50	—	—	—	—	—	—
9203; 10278	CDV-9-1(i)	F	INORGANIC	Manganese	ug/L	3	3	5.05	6.24	8.5	—	0	200	0	—	0	2020
9203; 10278	CDV-9-1(i)	F	INORGANIC	Mercury	ug/L	3	0	—	—	—	2	—	—	—	—	—	0.626
9203; 10278	CDV-9-1(i)	UF	INORGANIC	Mercury	ug/L	3	0	—	—	—	2	—	—	—	—	—	0.626
9203; 10278	CDV-9-1(i)	F	INORGANIC	Molybdenum	ug/L	3	3	1.82	2.073333333	2.23	—	0	—	0	1000	0	98.7
9203; 10278	CDV-9-1(i)	F	INORGANIC	Nickel	ug/L	3	3	0.615	0.819333333	1.17	—	0	—	0	200	0	372
9203; 10278	CDV-9-1(i)	F	INORGANIC	Perchlorate	ug/L	3	3	0.389	0.407333333	0.429	—	0	—	0	—	0	13.8
9203; 10278	CDV-9-1(i)	F	INORGANIC	Selenium	ug/L	3	0	—	—	—	50	—	—	—	—	—	98.7
9203; 10278	CDV-9-1(i)	F	INORGANIC	Silver	ug/L	3	0	—	—	—	50	—	—	—	—	—	81.2
9203; 10278	CDV-9-1(i)	F	INORGANIC	Strontium	ug/L	3	3	47.2	52.7	63.2	—	0	—	0	—	0	11800
9203; 10278	CDV-9-1(i)	F	INORGANIC	Thallium	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.197
9203; 10278	CDV-9-1(i)	F	INORGANIC	Uranium	ug/L	3	3	0.719	0.805	0.957	30	0	—	0	—	0	59.2
9203; 10278	CDV-9-1(i)	F	INORGANIC	Vanadium	ug/L	3	3	1.46	1.66	1.89	—	0	—	0	—	0	63.1

Frequency of Detections for analytes in untreated water from CdV-16-4ip, CdV-9-1(i) and CdV-16-1(i), based on samples collected in 2014 and 2015

event	location of max result	Field preparation code	RFI Class	Analyte	Units	Number of Analyses	Number of Detects	Min	Avg	Max	Human Health	Number Greater than HH	Other DWS	Number Greater than Other DWS	Irrigation	Number greater than Irrigation	NMED Table A-1 Tap Water
10278; 9203	CDV-9-1(i)	F	INORGANIC	Zinc	ug/L	3	1	5.68	5.68	5.68	—	0	10000	0	—	0	5960
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Acenaphthene	ug/L	3	0	—	—	—	—	—	—	—	—	—	535
9203; 10278	CDV-9-1(i)	UF	ORGANIC	RDX	ug/L	3	3	25	31.56666667	37.3	—	0	—	0	—	0	7.02
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Acrolein	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.0415
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Acrylonitrile	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.523
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Anthracene	ug/L	3	0	—	—	—	—	—	—	—	—	—	1720
9203	CDV-9-1(i)	UF	ORGANIC	Aroclor-1016	ug/L	2	0	—	—	—	—	—	—	—	—	—	1.4
9203	CDV-9-1(i)	UF	ORGANIC	Aroclor-1221	ug/L	2	0	—	—	—	—	—	—	—	—	—	0.0554
9203	CDV-9-1(i)	UF	ORGANIC	Aroclor-1232	ug/L	2	0	—	—	—	—	—	—	—	—	—	0.0554
9203	CDV-9-1(i)	UF	ORGANIC	Aroclor-1242	ug/L	2	0	—	—	—	—	—	—	—	—	—	0.389
9203	CDV-9-1(i)	UF	ORGANIC	Aroclor-1248	ug/L	2	0	—	—	—	—	—	—	—	—	—	0.389
9203	CDV-9-1(i)	UF	ORGANIC	Aroclor-1254	ug/L	2	0	—	—	—	—	—	—	—	—	—	0.389
9203	CDV-9-1(i)	UF	ORGANIC	Aroclor-1260	ug/L	2	0	—	—	—	—	—	—	—	—	—	0.389
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Benzene	ug/L	3	0	—	—	—	10	—	—	—	—	—	4.54
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Benzidine	ug/L	5	0	—	—	—	—	—	—	—	—	—	0.00107
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Benzo(a)anthracene	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.343
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Benzo(a)pyrene	ug/L	3	0	—	—	—	0.7	—	—	—	—	—	0.0343
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Benzo(b)fluoranthene	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.343
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Benzo(k)fluoranthene	ug/L	3	0	—	—	—	—	—	—	—	—	—	3.43
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Bis(2-chloroethyl)ether	ug/L	5	0	—	—	—	—	—	—	—	—	—	0.136
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Bis(2-ethylhexyl)phthalate	ug/L	3	0	—	—	—	—	—	—	—	—	—	55.6
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Bromodichloromethane	ug/L	3	0	—	—	—	—	—	—	—	—	—	1.34
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Bromoform	ug/L	3	0	—	—	—	—	—	—	—	—	—	91.9
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Bromomethane	ug/L	3	0	—	—	—	—	—	—	—	—	—	8
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Butanone[2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	5560
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Carbon Disulfide	ug/L	3	0	—	—	—	—	—	—	—	—	—	810
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Carbon Tetrachloride	ug/L	3	0	—	—	—	10	—	—	—	—	—	4.53
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chloro-1,3-butadiene[2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.187
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chlorobenzene	ug/L	3	0	—	—	—	—	—	—	—	—	—	77.6
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chlorodibromomethane	ug/L	3	0	—	—	—	—	—	—	—	—	—	1.68
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chloroethane	ug/L	3	0	—	—	—	—	—	—	—	—	—	20900
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chloroform	ug/L	3	0	—	—	—	100	—	—	—	—	—	2.29
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chloromethane	ug/L	3	0	—	—	—	—	—	—	—	—	—	20.3
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chloronaphthalene[2-]	ug/L	5	0	—	—	—	—	—	—	—	—	—	733
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chlorophenol[2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	91
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chlorotoluene[2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	233
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Chrysene	ug/L	3	0	—	—	—	—	—	—	—	—	—	34.3
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dibenz(a,h)anthracene	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.106
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dibromo-3-Chloropropane[1,2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.00336
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dibromoethane[1,2-]	ug/L	3	0	—	—	—	0.1	—	—	—	—	—	0.0746
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichlorobenzene[1,2-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	302
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichlorobenzene[1,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	4.81
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichlorobenzidine[3,3'-]	ug/L	5	0	—	—	—	—	—	—	—	—	—	1.24
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichlorodifluoromethane	ug/L	3	0	—	—	—	—	—	—	—	—	—	197
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichloroethane[1,1-]	ug/L	3	0	—	—	—	25	—	—	—	—	—	27.5
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichloroethane[1,2-]	ug/L	3	0	—	—	—	10	—	—	—	—	—	1.71
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichloroethene[1,1-]	ug/L	3	0	—	—	—	5	—	—	—	—	—	264
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichloroethene[cis-1,2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	36.5
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichloroethene[trans-1,2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	93.2

Frequency of Detections for analytes in untreated water from CdV-16-4ip, CdV-9-1(i) and CdV-16-1(i), based on samples collected in 2014 and 2015

event	location of max result	Field preparation code	RFI Class	Analyte	Units	Number of Analyses	Number of Detects	Min	Avg	Max	Human Health	Number Greater than HH	Other DWS	Number Greater than Other DWS	Irrigation	Number greater than Irrigation	NMED Table A-1 Tap Water
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichlorophenol[2,4-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	45.3
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dichloropropane[1,2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	4.37
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Diethyl Ether	ug/L	3	0	—	—	—	—	—	—	—	—	—	3930
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Diethylphthalate	ug/L	3	0	—	—	—	—	—	—	—	—	—	14800
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dimethylphenol[2,4-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	354
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Di-n-butylphthalate	ug/L	3	0	—	—	—	—	—	—	—	—	—	885
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dinitro-2-methylphenol[4,6-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	1.51
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dinitrophenol[2,4-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	38.8
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dinitrotoluene[2,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	2.37
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dinitrotoluene[2,6-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	0.484
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Dioxane[1,4-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	7.76
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Ethyl Methacrylate	ug/L	3	0	—	—	—	—	—	—	—	—	—	455
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Ethylbenzene	ug/L	3	0	—	—	—	750	—	—	—	—	—	14.9
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Fluoranthene	ug/L	3	0	—	—	—	—	—	—	—	—	—	802
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Fluorene	ug/L	3	0	—	—	—	—	—	—	—	—	—	288
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Hexachlorobenzene	ug/L	5	0	—	—	—	—	—	—	—	—	—	0.487
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Hexachlorobutadiene	ug/L	6	0	—	—	—	—	—	—	—	—	—	2.95
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Hexachlorocyclopentadiene	ug/L	3	0	—	—	—	—	—	—	—	—	—	27.8
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Hexachloroethane	ug/L	3	0	—	—	—	—	—	—	—	—	—	6.8
5771; 9203; 10278; 4559	CdV-16-1(i)	UF	ORGANIC	Tetrachloroethene	ug/L	4	3	0.79	0.856666667	0.91	20	0	—	0	—	0	40.3
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Indeno(1,2,3-cd)pyrene	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.343
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Isobutyl alcohol	ug/L	3	0	—	—	—	—	—	—	—	—	—	5910
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Isophorone	ug/L	3	0	—	—	—	—	—	—	—	—	—	779
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Isopropylbenzene	ug/L	3	0	—	—	—	—	—	—	—	—	—	447
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Methacrylonitrile	ug/L	3	0	—	—	—	—	—	—	—	—	—	1.91
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Methyl Methacrylate	ug/L	3	0	—	—	—	—	—	—	—	—	—	1390
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Tetrachloroethene	ug/L	7	7	0.73	0.937142857	1.06	20	0	—	0	—	0	40.3
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Methyl-2-pentanone[4-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	1240
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Methylene Chloride	ug/L	3	0	—	—	—	100	—	—	—	—	—	106
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Naphthalene	ug/L	6	0	—	—	—	—	—	—	—	—	—	1.65
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Nitrobenzene	ug/L	6	0	—	—	—	—	—	—	—	—	—	1.4
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Nitrosodimethylamine[N-]	ug/L	5	0	—	—	—	—	—	—	—	—	—	0.00165
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Nitroso-di-n-butylamine[N-]	ug/L	5	0	—	—	—	—	—	—	—	—	—	0.0272
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Nitrosopyrrolidine[N-]	ug/L	5	0	—	—	—	—	—	—	—	—	—	0.37
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Tetrachloroethene	ug/L	3	3	0.93	0.98	1.01	20	0	—	0	—	0	40.3
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Nitrotoluene[3-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	1.74
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Nitrotoluene[4-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	42.4
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Pentachlorobenzene	ug/L	3	0	—	—	—	—	—	—	—	—	—	3.07
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Pentachlorophenol	ug/L	3	0	—	—	—	—	—	—	—	—	—	0.4
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Phenanthrene	ug/L	3	0	—	—	—	—	—	—	—	—	—	170
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Phenol	ug/L	3	0	—	—	—	—	—	—	—	—	—	5760
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Pyrene	ug/L	3	0	—	—	—	—	—	—	—	—	—	117
5771; 9203; 10278; 4559	CdV-16-1(i)	UF	ORGANIC	Toluene	ug/L	4	3	3.04	6.623333333	13.5	750	0	—	0	—	0	1090
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Styrene	ug/L	3	0	—	—	—	—	—	—	—	—	—	1210
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Tetrachlorobenzene[1,2,4,5]	ug/L	3	0	—	—	—	—	—	—	—	—	—	1.66
9203	CDV-9-1(i)	UF	ORGANIC	Tetrachlorodibenzofuran[2,3,7,8-]	ug/L	2	0	—	—	—	—	—	—	—	—	—	2.01E-06
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Tetrachloroethane[1,1,1,2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	5.72
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Tetrachloroethane[1,1,2,2-]	ug/L	3	0	—	—	—	10	—	—	—	—	—	0.757
4559; 5695; 5771; 7044; 10278	CDV-16-4ip S1	UF	ORGANIC	Trichloroethene	ug/L	7	7	0.45	0.591428571	0.74	100	0	—	0	—	0	2.82

Frequency of Detections for analytes in untreated water from CdV-16-4ip, CdV-9-1(i) and CdV-16-1(i), based on samples collected in 2014 and 2015

event	location of max result	Field preparation code	RFI Class	Analyte	Units	Number of Analyses	Number of Detects	Min	Avg	Max	Human Health	Number Greater than HH	Other DWS	Number Greater than Other DWS	Irrigation	Number greater than Irrigation	NMED Table A-1 Tap Water
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Tetryl	ug/L	3	0	—	—	—	—	—	—	—	—	—	39.4
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Toluene	ug/L	3	0	—	—	—	750	—	—	—	—	—	1090
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trichloro-1,2,2-trifluoroethane[1,1,2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	55000
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trichlorobenzene[1,2,4-]	ug/L	6	0	—	—	—	—	—	—	—	—	—	3.98
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trichloroethane[1,1,1-]	ug/L	3	0	—	—	—	60	—	—	—	—	—	8000
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trichloroethane[1,1,2-]	ug/L	3	0	—	—	—	10	—	—	—	—	—	0.415
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trichloroethene	ug/L	3	3	0.31	0.356666667	0.41	100	0	—	0	—	0	2.82
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trichlorofluoromethane	ug/L	3	0	—	—	—	—	—	—	—	—	—	1140
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trichlorophenol[2,4,5-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	1170
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trichlorophenol[2,4,6-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	11.9
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trichloropropane[1,2,3-]	ug/L	5	0	—	—	—	—	—	—	—	—	—	0.00747
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Trinitrotoluene[2,4,6-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	9.8
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Vinyl acetate	ug/L	3	0	—	—	—	—	—	—	—	—	—	409
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Vinyl Chloride	ug/L	3	0	—	—	—	1	—	—	—	—	—	0.201
9203; 10278	CDV-9-1(i)	UF	ORGANIC	Xylene[1,2-]	ug/L	3	0	—	—	—	—	—	—	—	—	—	193

ENCLOSURE 6

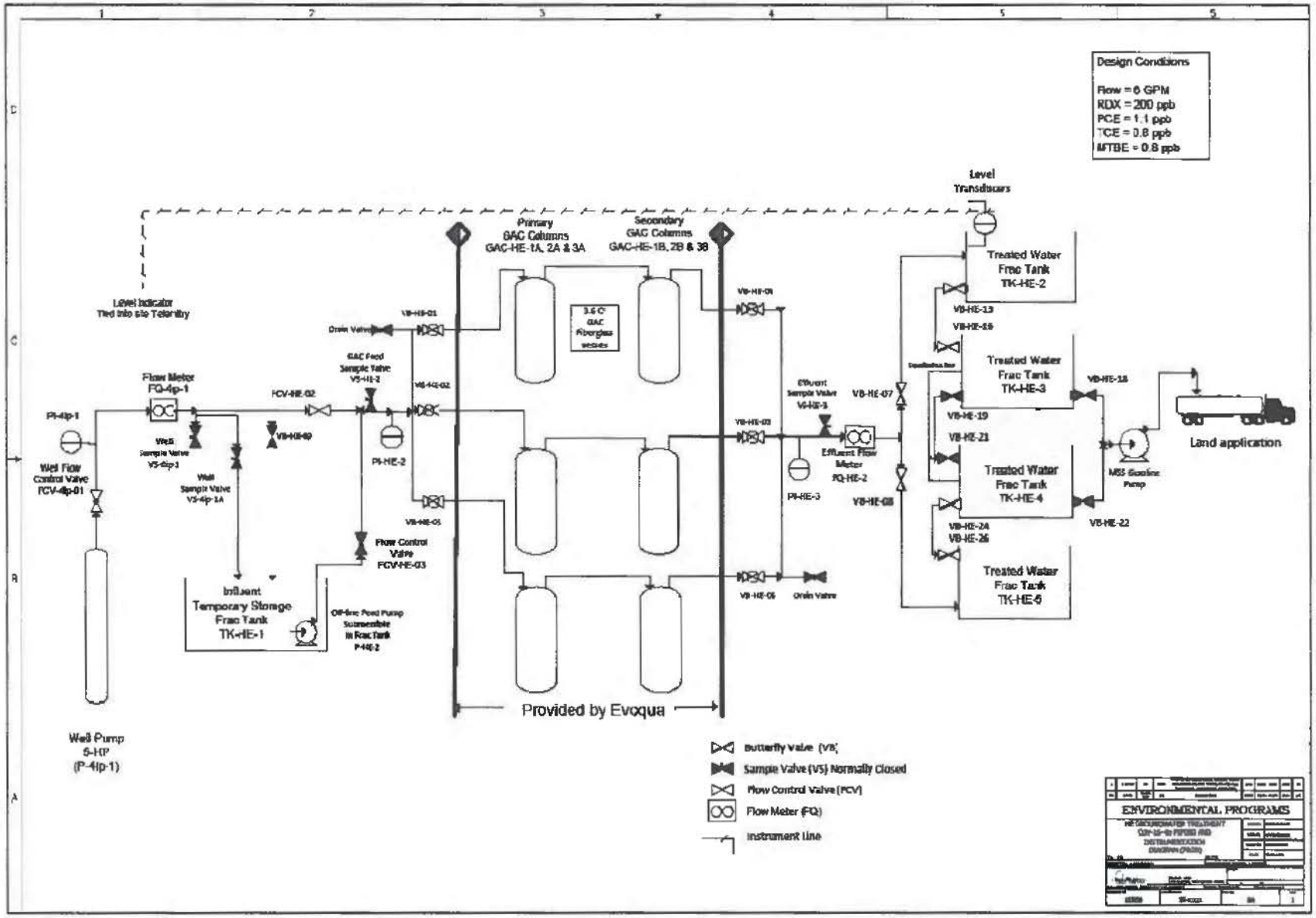
GAC Well Treatment System Details

ENV-DO-16-064

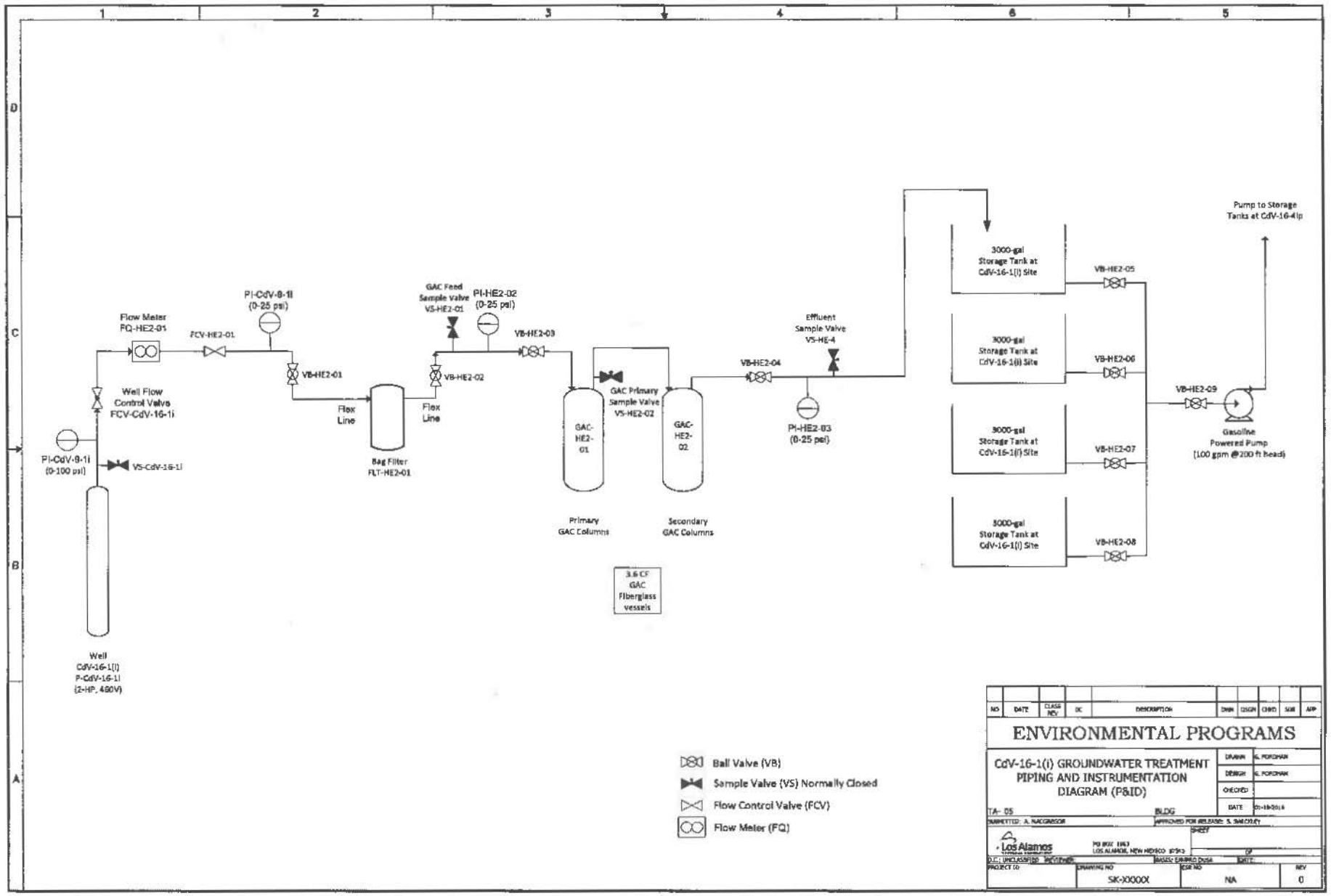
LA-UR-16-21518

U1501760

Date: MAR 2 2 2016



Details of large granular activated carbon treatment system for use at CdV-9-1(i) and CdV-16-4ip


Well
CdV-16-1(i)
P-CdV-16-1i
(2-HP, 480V)
PI-CdV-8-1i
(0-100 psi)
VS-CdV-16-1i
Well Flow
Control Valve
FCV-CdV-16-1i
Flow Meter
FQ-HE2-01
FCV-HE2-01
PI-CdV-8-1i
(0-25 psi)
VB-HE2-01
Flex
Line
Bag Filter
FLT-HE2-01
Flex
Line
GAC Feed
Sample Valve
VS-HE2-01
VB-HE2-02
PI-HE2-02
(0-25 psi)
VB-HE2-03
GAC-
HE2-
01
GAC Primary
Sample Valve
VS-HE2-02
GAC-
HE2-
02
Primary
GAC Columns
Secondary
GAC Columns
3.6 CF
GAC
Fiberglass
vessels
VB-HE2-04
Effluent
Sample Valve
VS-HE-4
PI-HE2-03
(0-25 psi)
3000-gal
Storage Tank at
CdV-16-1(i) Site
3000-gal
Storage Tank at
CdV-16-1(i) Site
3000-gal
Storage Tank at
CdV-16-1(i) Site
3000-gal
Storage Tank at
CdV-16-1(i) Site
VB-HE2-05
VB-HE2-06
VB-HE2-07
VB-HE2-08
VB-HE2-09
Pump to Storage
Tanks at CdV-16-4ip
Gasoline
Powered Pump
(100 gpm @200 ft head)
Ball Valve (VB)
Sample Valve (VS) Normally Closed
Flow Control Valve (FCV)
Flow Meter (FQ)
ENVIRONMENTAL PROGRAMS
CdV-16-1(i) GROUNDWATER TREATMENT
PIPING AND INSTRUMENTATION
DIAGRAM (P&ID)
TA- 05
BLDG
SHEET
Los Alamos
PROJECT ID
DRAWING NO
SK-XXXXX
REQ NO
N/A
REV
0

evoqua
WATER TECHNOLOGIES

AQUACARB® S SERIES GRANULAR REACTIVATED CARBON AQUACARB® NS, AQUACARB® RS & AQUACARB® RSD CARBONS

FOR INDUSTRIAL AND REMEDIAL WATER TREATMENT

Description

AquaCarb® S Series carbons are produced through thermal reactivation of approved grades of spent carbon at one of our state-of-the-art ISO 14001 certified reactivation facilities. Through careful control of the residence time in the reactivation furnace, reactivation temperature, and reactivation gas composition, adsorbed contaminants on the spent carbon are removed and destroyed, and the carbon's internal pore structure is maintained as close to virgin condition as possible. AquaCarb® S Series reactivated carbons are pooled from a variety of sources, ensuring consistent product properties. The resulting carbon serves as an excellent economic alternative to virgin carbon for the removal of a broad range of organic contaminants from wastewater, process water, and groundwater streams.

Applications

Cost effective AquaCarb® S Series reactivated carbons have been demonstrated to provide excellent performance in a variety of liquid phase treatment applications, including the following:

- Removal of organic contaminants
- Pesticide removal
- Groundwater remediation
- Wastewater treatment
- Industrial process water treatment
- Biological activated carbon support

Quality Control

Evoqua's laboratories are fully equipped to provide complete quality control analysis using ASTM standard test methods in order to assure the consistent quality of all Westates® actived carbons.

Our technical staff offers hands-on guidance in selecting the most appropriate system, operating conditions and carbon to meet your needs. For more information contact your nearest Evoqua representative.

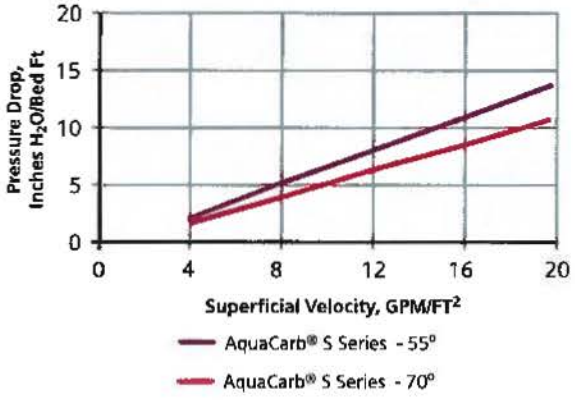
FEATURES AND BENEFITS:

- Reactivated carbons serve as an economical alternative to virgin carbon in many applications
- Use of reactivated carbons reduce the volume of spent carbon sent to landfill and encourages responsible usage of natural resources
- A detailed quality assurance program guarantees consistent quality from lot to lot and shipment to shipment
- Pooled reactivated carbons provide consistent properties and performance
- Reactivated carbons produced at ISO 14001 certified reactivation facilities, ensuring minimization of environmental liability and continued benchmarking against best practice standards for environmental management

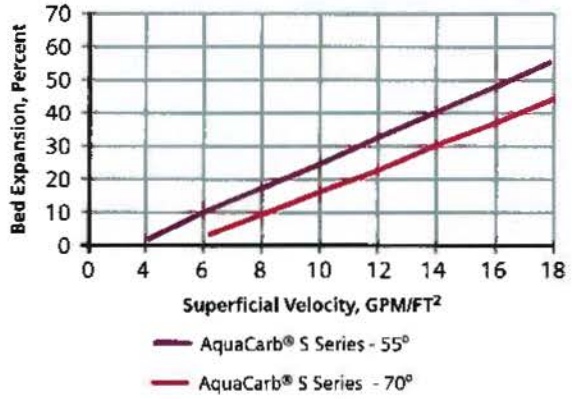
TYPICAL PROPERTIES

Parameter	AquaCarb® S Carbon
Carbon Type	Reactivated Coconut/Coal
Mesh Size, U.S. Sieve	8 x 30
Iodine No., mg I2/g	800 -1000
Apparent Density, g/cc	0.46 - 0.60
Moisture as Packed, Wt. %	2

Downflow Pressure Drop Through
A Backwashed and Stratified Bed (Typical)



Percent Bed Expansion During Backwash (Typical)



Safety Note: Under certain conditions, some compounds may oxidize, decompose or polymerize in the presence of activated carbon causing a carbon bed temperature rise that is sufficient to cause ignition. Particular care must be exercised when compounds that have a peroxide-forming tendency are being adsorbed. In addition the adsorption of VOCs will lead to the generation of heat within a carbon bed. These heats of reaction and adsorption need to be properly dissipated in order to fully assure the safe operation of the bed.

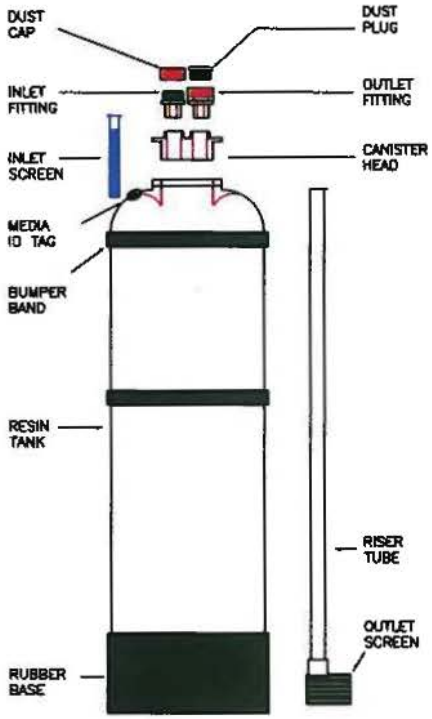
Wet activated carbon readily adsorbs atmospheric oxygen. Dangerously low oxygen levels may exist in closed vessels or poorly ventilated storage areas. Workers should follow all applicable state and federal safety guidelines for entering oxygen depleted areas.

evoqua WATER TECHNOLOGIES

4800 North Point Parkway, Suite 250, Alpharetta, GA 30022

+1 (866) 926-8420 (toll-free) +1 (978) 614-7233 (toll) www.evoqua.com

STD: BORDER-0108-8X11A | INTL REF: | BAR = 1" AT PLOT SCALE



TANK BODY MAT. OF. CONST.:	FIBERGLASS
HEIGHT:	50in
DIAMETER:	14in
SERVICE FLOW RATE:	2-10gpm
MAX. OPERATING PRESSURE:	75psig
MAX. OPERATING TEMPERATURE:	120°F
WEIGHT (EMPTY):	(APPROX.)40lbs
WEIGHT (FULL/DRY):	(APPROX.)195lbs
WEIGHT (FULL/WET):	(APPROX.)305lbs

DESIGNER	GOA	DATE 7/1/08
CHECKER		DATE
ENGINEER		DATE
MANAGER		DATE
FILE:		
SCALE:		

TITLE: 3.6R3 FIBERGLASS WASTEWATER ION EXCHANGE TANK

CLIENT

SIEMENS Water Technologies
Roseville, MN
651-638-1300 Fax 651-633-5074

PROJECT	CODE	DRAWING	SHEET	REV
			1 OF 1	