SGW-58719
Revision 0

RCRA Groundwater Quarterly Report for July through September 2014

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

CH2MHILL
Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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By Ashley R Jenkins at 2:47 pm, May 13, 2015

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Terms

AEA	*Atomic Energy Act of 1954*
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CHPRC	CH2M HILL Plateau Remediation Company
Cr(VI)	hexavalent chromium
DOE	U.S. Department of Energy
DWS	drinking water standard
GEL	GEL Laboratories
HEIS	Hanford Environmental Information System
LERF	Liquid Effluent Retention Facility
LLWMA	low-level waste management area
LOQ	limit of quantitation
NRDWL	Nonradioactive Dangerous Waste Landfill
NTU	nephelometric turbidity unit
QC	quality control
RCRA	*Resource Conservation and Recovery Act of 1976*
SST	single-shell tank
TASL	TestAmerica St. Louis
TOC	total organic carbon
TOX	total organic halides
WMA	waste management area

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1 Introduction

The CH2M HILL Plateau Remediation Company (CHPRC) Soil and Groundwater Remediation Project presents data in this project document describing sampling performed in accordance with the *Resource Conservation and Recovery Act of 1976* (RCRA) during the July through September 2014 reporting period.

Groundwater monitoring objectives of RCRA, the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), and the *Atomic Energy Act of 1954* (AEA) often differ slightly, and the contaminants monitored are not always the same. For RCRA-regulated units, monitoring focuses on nonradioactive dangerous waste constituents. While radionuclides (source, special nuclear, and byproduct materials) may be monitored in some RCRA unit wells to support objectives of monitoring under AEA and/or CERCLA, they are not subject to RCRA regulation. Pursuant to RCRA, the source, special nuclear, and byproduct material components of radioactive mixed waste are regulated by the U.S. Department of Energy (DOE), acting in accordance with its AEA authority. Therefore, while this report is used to satisfy RCRA reporting requirements, the inclusion of information on radionuclides in such a context is for information only and may not be used to create conditions or other restrictions set forth in any RCRA Permit.

Quarterly information is provided to status sampling, summarize recent and pending monitoring changes, and report statistical exceptions. Groundwater monitoring result highlights and site maps are provided only if changes are determined to be significant. Data are officially reported and accessed through the DOE 2012 Environmental Dashboard Application.

Chapters 2 and 3 identify any quality control (QC) or laboratory issues and the sampling and analysis status for the reporting period. Chapters 4, 5, and 6 present a general status update including sampling activity, significant results, and applicable site maps and trend charts.

2 Quality Control and Laboratory Issues

No laboratory or QC issues were identified for the reporting period.

3 Sampling and Analysis Status

This section lists missed or delayed samples.

3.1 Missed Sampling

Table 1 presents samples scheduled but not collected during the quarter. The table includes the site, scheduled period that was not collected, frequency of sampling, and any comments. Further information is included in the site-specific discussion.

Table 1. Sampling Not Completed

Well	Site	Scheduled	Frequency	Comments
N/A	N/A	N/A	N/A	N/A

3.2 Sampling Completed after Quarterly Reporting Period

Table 2 shows wells scheduled but collected after completion of the quarter. The table includes the site, scheduled period that was not collected, frequency of sampling, and any comments. Further information is included in the site-specific discussion.

Table 2. Sampling Completed after Quarter

Well	Site	Scheduled	Frequency	Comments
N/A	N/A	N/A	N/A	N/A

3.3 Stop Work

No stop work orders affecting groundwater sampling were in effect during the reporting period.

4 Inactive Waste Management Areas

The following closed and inactive treatment, storage, and disposal units received nonradioactive dangerous waste for active management after RCRA regulation became jurisdictionally applicable to that activity. Groundwater monitoring around the units must continue in order to detect releases to groundwater of residual dangerous wastes in each unit. Summary status and monitoring highlights of results by exception are provided for each area.

4.1 1301-N Liquid Waste Disposal Facility (Final Status, Detection Monitoring)

All five wells were sampled as scheduled in September. Results were loaded into the Hanford Environmental Information System (HEIS) and did not exceed critical mean values. The next scheduled sampling event is March 2015.

4.2 1324-N/NA Facilities (Final Status, Detection Monitoring)

All five wells were sampled as scheduled in September and results were loaded into HEIS. The next scheduled sampling event is March 2015.

Specific conductance results continued to be above the critical mean at Wells 199-N-72 nd 199-N-165. A previous groundwater quality assessment, *Results of Groundwater Quality Assessment Monitoring at the 1301-N and 1324-N/NA Facilities*, (WHC-SD-EN-EV-003), indicated that high specific conductance is caused by the nonregulated constituents sulfate and sodium, and remains valid as reflected in Figures 1 and 2, showing comparison of specific conductance to sulfate trends for Wells 199-N-72 and 199-N-165. Results did not exceed critical mean values for the remaining indicator parameters.

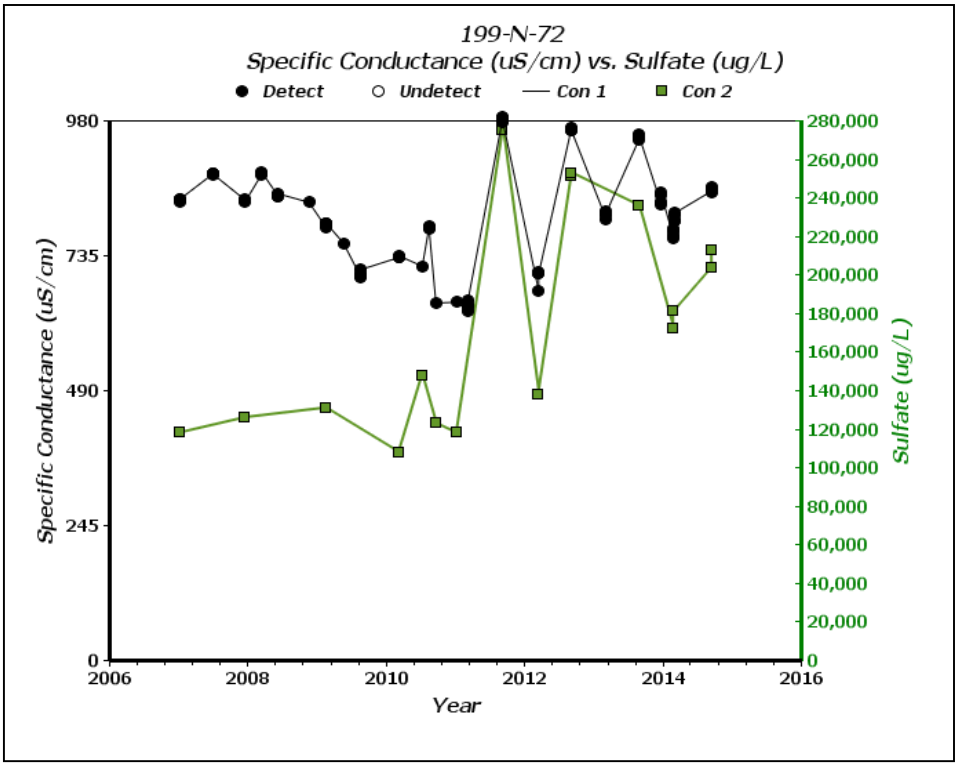

Figure 1. Specific Conductance and Sulfate in Well 199-N-72

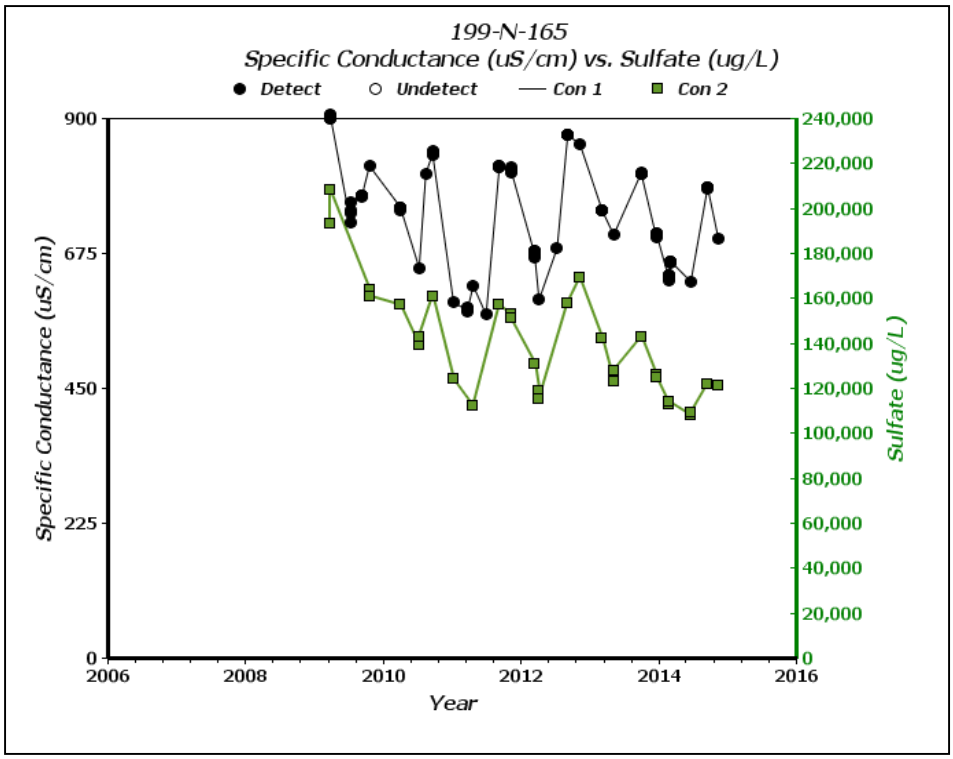

Figure 2. Specific Conductance and Sulfate in Well 199-N-165

4.3 1325-N Liquid Waste Disposal Facility (Final Status, Detection Monitoring)

All five wells were sampled as scheduled in September and results were loaded into HEIS. The next sampling event is scheduled for March 2015.

Specific conductance results continued to be above the critical mean in downgradient monitoring wells (Figures 3-5). This is a continuation of previous exceedances noted from 1999 through 2011. The assessment report, *Results of Assessment at the 1325-N Facility*, (00-GWVZ-054), for the original 1999 exceedance at Well 199-N-41 concluded that the exceedance was caused by past discharges of nonregulated contaminants to the 120-N-1 site. Results did not exceed critical mean values for the remaining indicator parameters.

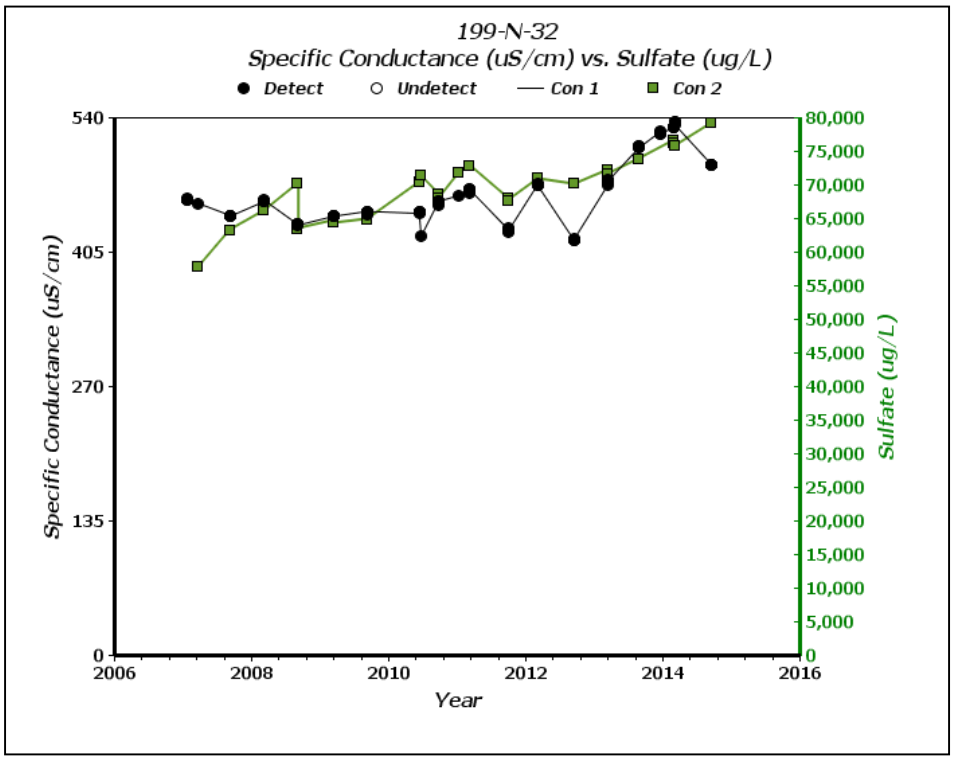

Figure 3. Specific Conductance and Sulfate in Well 199-N-32

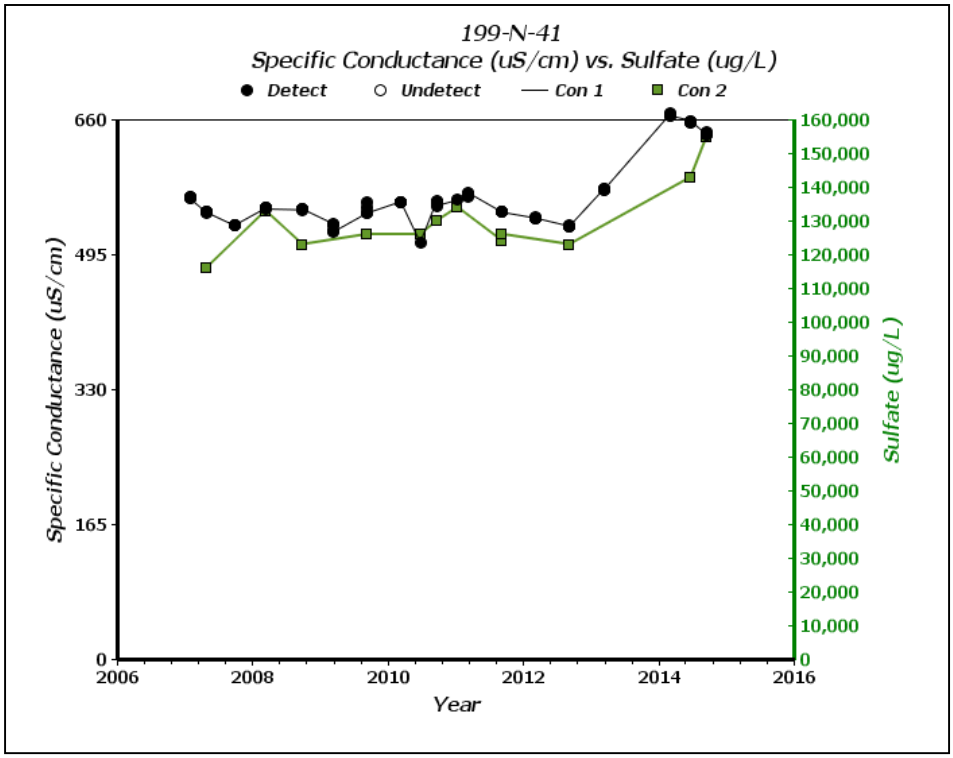

Figure 4. Specific Conductance and Sulfate in Well 199-N-41

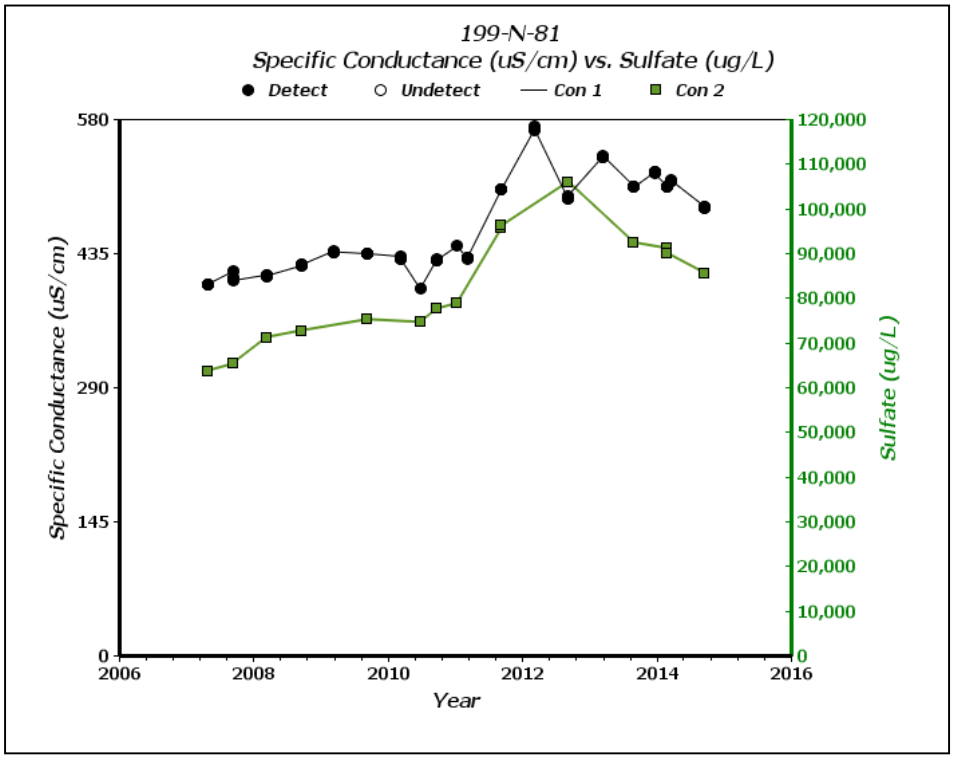

Figure 5. Specific Conductance and Sulfate in Well 199-N-81

4.4 183-H Solar Evaporation Basins (Final Status, Corrective Action Monitoring)

No RCRA sampling was scheduled during the quarter. Sampling was conducted for the CERCLA program at three of the wells.

Hexavalent chromium (Cr(VI)) concentrations in Well 199-H4-84 were 80.0 µg/L in July, 26.0 µg/L in August, and 16.0 µg/L in September. Cr(VI) concentrations are directly correlated to water table fluctuations in this well. Since water levels peaked in July, and started to drop in August, the decline in concentrations was expected. The Cr(VI) result in Well 199-H4-12C, which is completed in the Ringold Formation upper mud unit, was at 108 and 112 µg/L in July, 102 and 111 µg/L in August, and 115 µg/L during September. These results are consistent with previous monitoring events. Concentrations no longer exceed the permit limit of 122 µg/L. Concentrations of Cr(VI) in Well 199-H4-12A were below detection during the reporting period.

Nitrate and fluoride were monitored in Well 199-H4-84 with concentrations of 34.7 mg/L nitrate and 146 µg/L fluoride. Technetium-99 was monitored in Well 199-H4-12A, and was below the minimum detectable activity.

Uranium concentrations in Well 199-H4-84 were at 52.1 µg/L in July, which exceeds the 30 µg/L drinking water standard (DWS). Uranium concentrations in this well declined to 23 and 26.1 µg/L (unfiltered and filtered) in August, and 15.7 µg/L in September. As expected for a well located within a source area, uranium concentrations in Well 199-H4-84 correlate directly with changes in water levels. Concentrations in Well 199-H4-12A and 199-H4-12C were below 2 µg/L during the reporting period.

4.5 300 Area Process Trenches (Final Status, Corrective Action Monitoring)

All eight wells scheduled were sampled successfully during the quarter. The next scheduled sampling event is December 2014.

The concentration of *cis*-1,2-dichloroethene continues to exceed the 70 µg/L DWS at Well 399-1-16B (170 µg/L in July, 162 µg/L in August, and 176 µg/L in September), which is screened in the lower unconfined aquifer. The origin for *cis*-1,2-dichloroethene is attributed to degradation of trichloroethene disposed to the 300 Area Process Trenches and/or North Process Pond.

Concentrations of uranium continue to exceed the 30 µg/L DWS at Well 399-1-16A (49.0 µg/L in August, and 56.8 µg/L in September) and in Well 399-1-17A (66.6 µg/L in July, 75.4 and 77.7 µg/L in August, and 66.3 µg/L in September) at the southern end of the process trenches.

4.6 216-A-29 Ditch (Interim Status, Indicator Evaluation Monitoring)

No sampling scheduled during the quarter. The next scheduled sampling event is October 2014.

4.7 216-B-3 Pond (Interim Status, Indicator Evaluation Monitoring)

All four network wells were successfully sampled as scheduled during the quarter and results were loaded into HEIS. Results were less than or within the 2014 critical mean ranges. Total organic halides (TOX) values from GEL Laboratories (GEL) were nondetect. Reported TOX results from TestAmerica St. Louis (TASL) did not exceed the limit of quantitation (LOQ). The next scheduled sampling is January 2015.

4.8 216-B-63 Trench (Interim Status, Indicator Evaluation Monitoring)

No sampling scheduled during the quarter. The next scheduled sampling event is October 2014.

4.9 216-S-10 Pond and Ditch (Interim Status, Indicator Evaluation Monitoring)

No sampling scheduled during the quarter. The next scheduled sampling event is November 2014.

4.10 Nonradioactive Dangerous Waste Landfill (Interim Status, Indicator Evaluation Monitoring)

The nine network wells were sampled as scheduled during July and results were loaded into HEIS. The next scheduled semiannual sampling event is January 2015.

pH measurements were within the range of 2014 critical mean values. The mean of the quadruplicate specific conductance measurements in downgradient Wells 699-25-34A, 699-25-34B, and 699-25-34D from the July sampling event exceeded the 2014 critical mean. A groundwater assessment, (*Results of Assessment at the Non-Radioactive Dangerous Waste Landfill*, 01-GWVZ-025), performed in 2001 related to critical mean exceedances of specific conductance concluded elevated specific conductance was due to non-dangerous waste constituents bicarbonate, sulfate, calcium, and magnesium.

Quadruplicate samples for total organic carbon (TOC) analysis were less than the critical mean. Insufficient laboratory data is currently available to calculate the LOQ value needed for comparison to the GEL reported TOX results. TOX results reported from TASL were less than the TASL LOQ.

4.11 216-A-36B Crib (Interim Status, Indicator Evaluation Monitoring)

The four network wells were successfully sampled as scheduled in July. Results were loaded into HEIS during the quarter, and did not exceed 2014 critical mean values or ranges. The next scheduled semiannual sampling event is January 2015.

4.12 216-A-37-1 Crib (Interim Status, Indicator Evaluation Monitoring)

Three of the four network wells were successfully sampled as scheduled during July. Results were loaded into HEIS and did not exceed 2014 critical mean values or ranges. Sampling of Well 299-E25-17 was delayed until August because of a pump failure. The next scheduled semiannual sampling event is January 2015.

A new pump and stainless steel riser pipe was installed in Well 299-E25-17 on August 13 and was successfully sampled on August 22. Specific conductance, pH, and TOC results for this well were loaded into HEIS, with no values exceeding critical mean values or ranges. Anomalously high quadruplicate results for TOC that exceeded the 2014 critical mean initiated a request for a data review . Elevated TOC concentrations in Well 299-E25-17 correlated with removal of the older pump and connections and installation of new equipment in Well 299-E25-17. It is suspected the pump removal and installation process back in August resulted in dislodging organic residue from the casing walls. Cleaning (swabbing/brushing) of the inner well casing, redevelopment of the well, and resampling was conducted in December 9 and 10 to evaluate the impact to TOC concentrations. Sampling was performed on December 12 following the well cleaning and redevelopment. A 15 day turnaround was requested for TOC sample results for the sample splits provided to two laboroatries. Results were loaded into HEIS in December. Both laboratories reported TOC concentrations below the critical mean.

5 Groundwater Monitoring Single-Shell Tank Farm Waste Management Areas

RCRA units that have not yet achieved fully permitted status are monitored under interim status groundwater monitoring programs. Single-shell tank (SST) farms are all monitored under RCRA groundwater assessment and are designated as waste management areas (WMAs). Summary status and monitoring highlights of results are provided for each area.

5.1 SST WMA A-AX (Interim Status, Assessment Monitoring)

All eight network wells were sampled as scheduled in September and results were loaded into HEIS. Values for these parameters were generally with recent trends and ranges. The nitrate concentration in Well 299-E24-20 (49,100 µg/L) exceeded the DWS of 45,000 µg/L (Figure 6). The concentration of Tc-99 in Wells 299-E24-22 (1,670 pCi/L) and 299-E25-93 (1,000 pCi/L) were above the DWS of 900 pCi/L (Figure 7). The next scheduled quarterly sampling event is December.

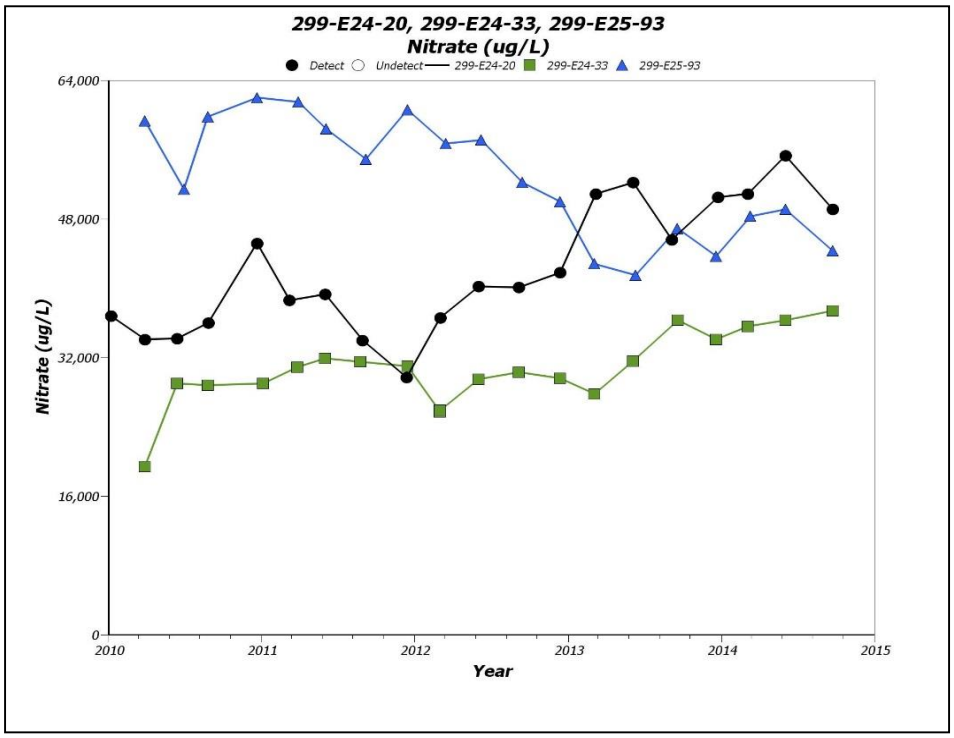

Figure 6. Nitrate in Wells 299-E24-20, 299-E24-33, 299-E25-93

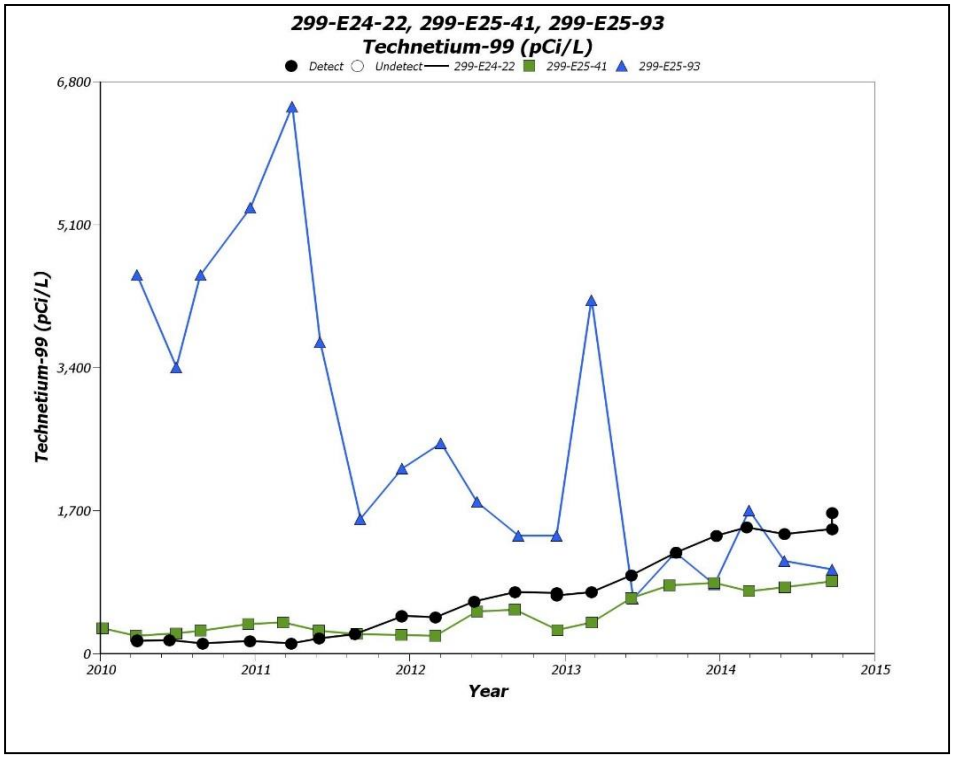

Figure 7. Technetium-99 in Wells 299-E24-22, 299-E25-41, and 299-E25-93

5.2 SST WMA B-BX-BY (Interim Status, Assessment Monitoring)

All fifteen WMA B/BX/BY monitoring wells were sampled as scheduled in August and results were loaded into HEIS. The next scheduled sampling event is November 2014.

The field results included dissolved oxygen, oxidation reduction potential, pH, specific conductance, temperature, and turbidity. All parameters are on trend. The pH results ranged from 7.53 to 8.03 and specific conductance results ranged from 627 to 3,002. The highest specific conductance is associated with Well 299-E33-47, located on the east side of the B Tank Farm. The high specific conductance results are associated with releases from the 241-B Tank Farm, which includes the dangerous waste constituent cyanide. Other elevated specific conductance is mainly associated with migration of contaminants sourced by the BY Cribs and the 241-BX-102 unplanned release.

The dangerous waste constituent cyanide concentration at Well 299-E33-47 continues to exceed the DWS (1,150 µg/L). Cyanide is also present at levels exceeding the DWS at other wells at WMA B-BX-BY, but is generally associated with southeast migration associated with the BY Cribs. The exception is Well 299-E33-338, which is also associated with the dangerous waste constituent associated with WMA B-BX-BY.

Nitrate values continue to exceed the DWS across WMA B-BX-BY with the highest concentration at Well 299-E33-47. The nitrate concentration at Well 299-E33-47 was similar between May and August decreasing slightly from 1,480 mg/L to 1,430 mg/L.

Two new dual purpose WMA B-BX-BY wells were drilled this quarter (Figure 8). During drilling one water sample was collected within the perched water horizon at Well 299-E33-360. The results of key contaminants are provided in Table 3. In addition, two groundwater samples were collected during drilling within the unconfined aquifer at Well 299-E33-361. One sample was collected in the upper part of the aquifer and the other sample near the bottom of the aquifer (Table 3). The wells will be screened across the unconfined aquifer. It is estimated that the wells will be cleared in early calendar year 2015 and

these wells will be added to the revised *Groundwater Sampling and Analysis Plan for the 200-BP-5 Groundwater Operable Unit* (DOE/RL-2014-33) and a future revision of the *Groundwater Quality Assessment Plan for the Single-Shell Tank Waste Management Area B-BX-BY*, (DOE/RL-2012-53).

Table 3. Perched Water Results at Well 299-E33-360

Well	Sample Location	Cyanide (µg/L)	Nitrate (mg/L)	Technetium-99 (pCi/L)	Tritium (pCi/L)	Uranium (µg/L)
299-E33-360	Perched Water Horizon	NA	1,780	19,700	99,900	257,000
299-E33-361	9.5 ft below Water Table	91.4	201	2,740	NA	26.4
299-E33-361	15 ft below Water Table	280	487	8,390	NA	241

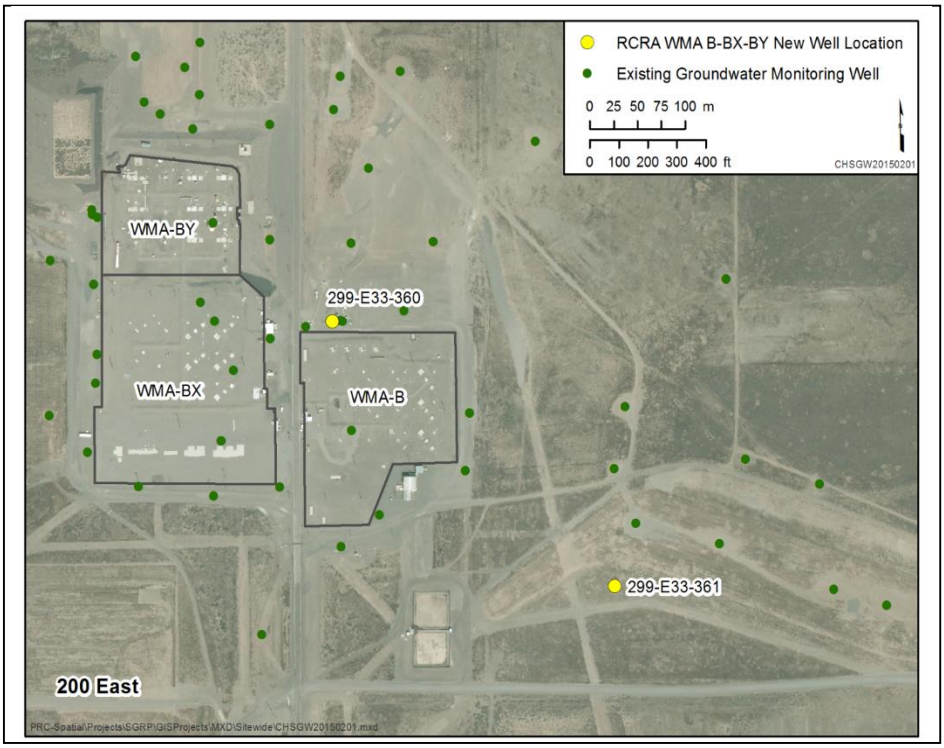

Figure 8. Two New Dual Purpose 200-BP-5 & B-BX-BY Monitoring Well Installations & Locations

5.3 SST WMA C (Interim Status, Assessment Monitoring)

All sampling results for the September sampling event were loaded into HEIS by the end of October. The RCRA assessment sample results included alkalinity, anions, cyanide, and metals. The field parameters included pH, specific conductance, temperature, and turbidity. The only dangerous waste or dangerous waste constituent associated with WMA C is cyanide. Other potential dangerous waste constituents associated with WMA C have not been found. Some metals are still evaluated for geochemical parameters, but all other dangerous waste or dangerous waste constituents have been excluded through the assessment process as discussed in Section 4 of DOE/RL-2009-77, *Groundwater Quality Assessment Plan for the Single-Shell tank Waste Management Area-C*. The next scheduled quarterly sampling event is December 2014.

The dangerous waste constituent cyanide was detected at five wells (299-E27-4, 299-E27-14, 299-E27-23, 299-E27-24, and 299-E27-155) in September 2014. The concentrations ranged from 3.4 to 9.2 µg/L, which is significantly lower than the 200 µg/L DWS. Well 299-E27-24, screened across the lower part of

the aquifer, had the highest concentration and concentrations have ranged between 7.9 and 15.3 µg/L since being installed in 2010. Based on the history of results cyanide is present at low levels to the south and southwest of WMA C, and extends to the bottom of the aquifer.

Nitrate exceeded 45 mg/L at only three wells in September (299-E27-14, 299-E27-24, and 299-E27-25). Two of these wells are downgradient of WMA C (299-E27-14 and 299-E27-24). Nitrate concentrations in these downgradient wells have shown to be relatively stable during the past three years (Figure 9). The upgradient well, 299-E27-25, is influenced by plume migration from the north.

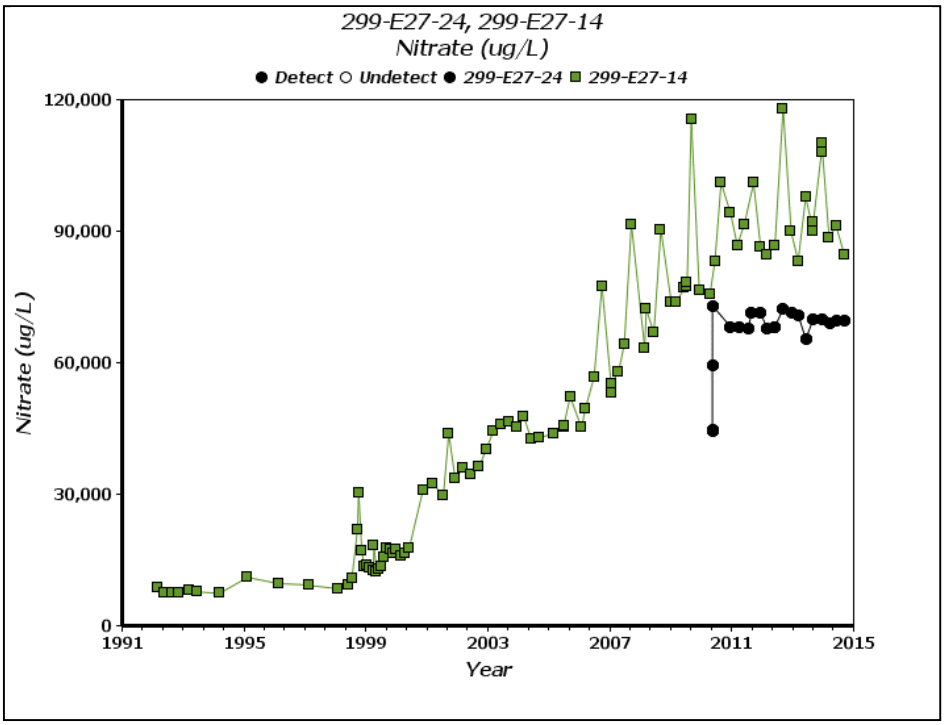

Figure 9. Nitrate in Downgradient Wells in WMA C

5.4 SST WMA S-SX (Interim Status, Assessment Monitoring)

Two wells were scheduled for sampling during the quarter (299-W22-47 and 299-W23-19), and both were sampled successfully. Well 299-W22-50 is normally sampled quarterly, but this well was found to be dry during the previous quarter. A replacement well is planned to be drilled in 2015. The July sample results for 299-W22-45 (delayed from the previous quarter due to issues with vapors from the high-level waste tanks) and the August results for 299-W23-15 (delayed from the previous quarter due to low water levels) were loaded into HEIS during the quarter. Well 299-W23-15 is becoming dry; a replacement well is planned to be drilled during 2015. The next scheduled sampling is December 2014.

Chromium and nitrate were on trend at 299-W23-19 (Figures 10 and 11). Chromium was 404 µg/L (filtered) and 415 µg/L (unfiltered), and nitrate was 142 mg/L. Concentrations had declined rapidly in this well in response to the startup of the WMA S-SX groundwater extraction system in 2012, but concentrations have been relatively stable since late 2013.

Corrosion of the well screen is occurring at 299-W23-15, as evidenced by a substantial increase in nickel concentrations. Chromium (unfiltered), iron (unfiltered) and manganese (filtered and unfiltered) were also elevated (Figures 12-15). All 4 of these constituents are components of 304 stainless steel of which the well is constructed. This well is becoming dry, and it is not uncommon for such wells to experience corrosion. A replacement well is planned to be drilled during FY 2015.

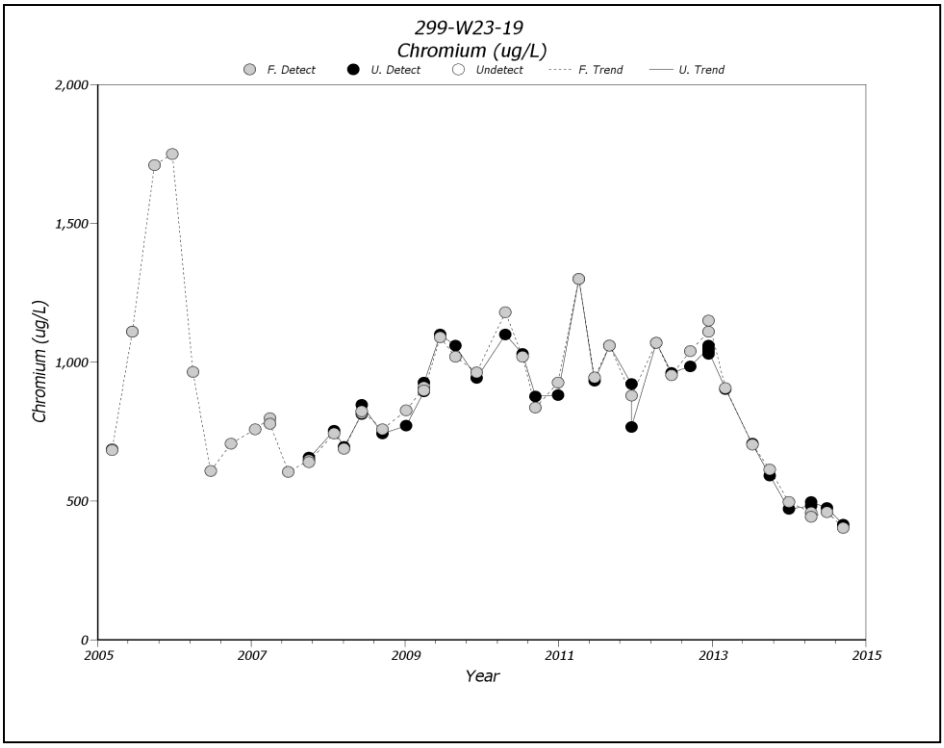

Figure 10. Chromium in Well 299-W23-19

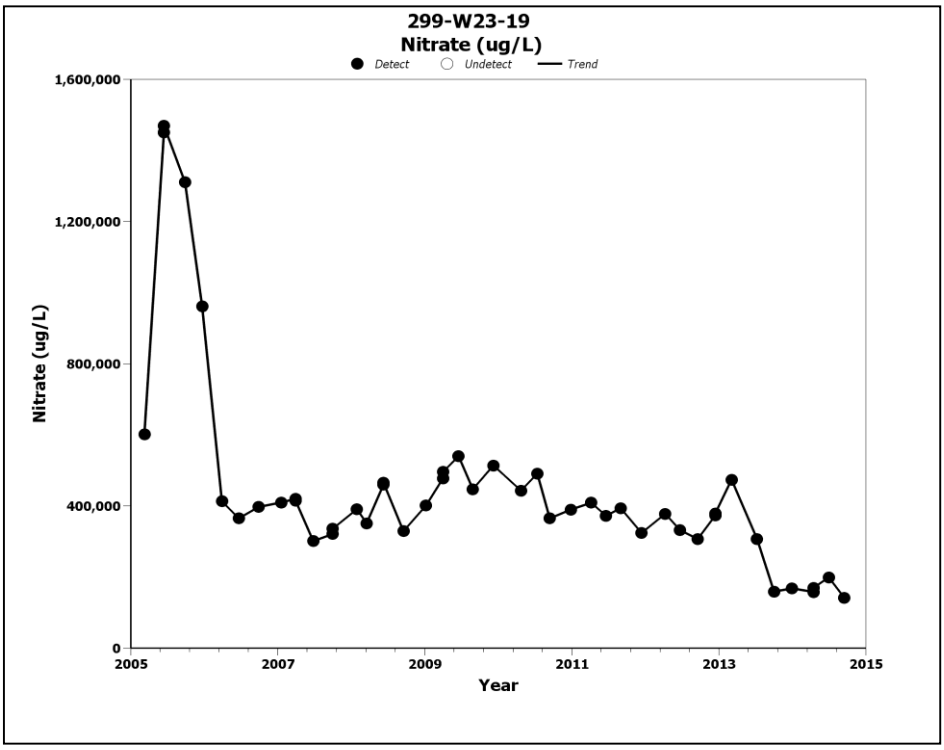

Figure 11. Nitrate in Well 299-W23-19

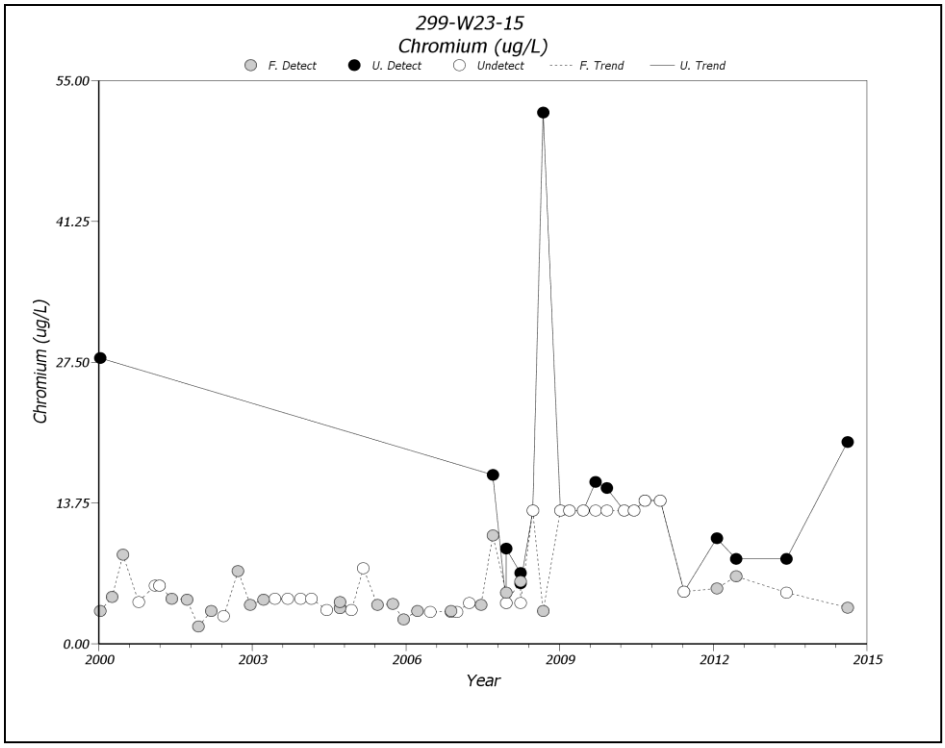

Figure 12. Chromium in Well 299-W23-15

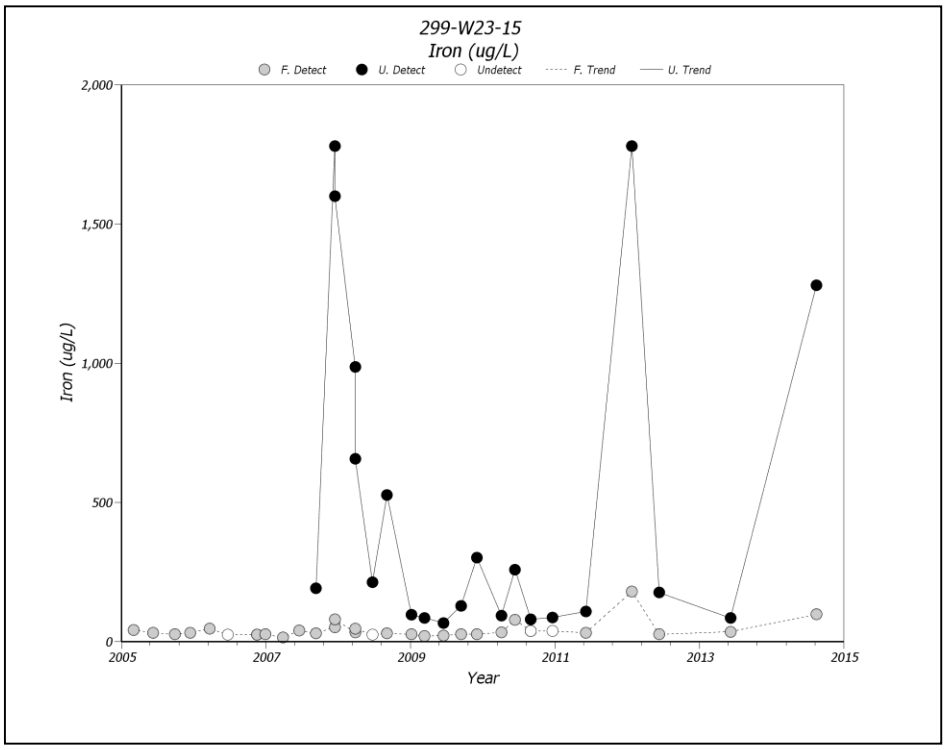

Figure 13. Iron in Well 299-W23-15

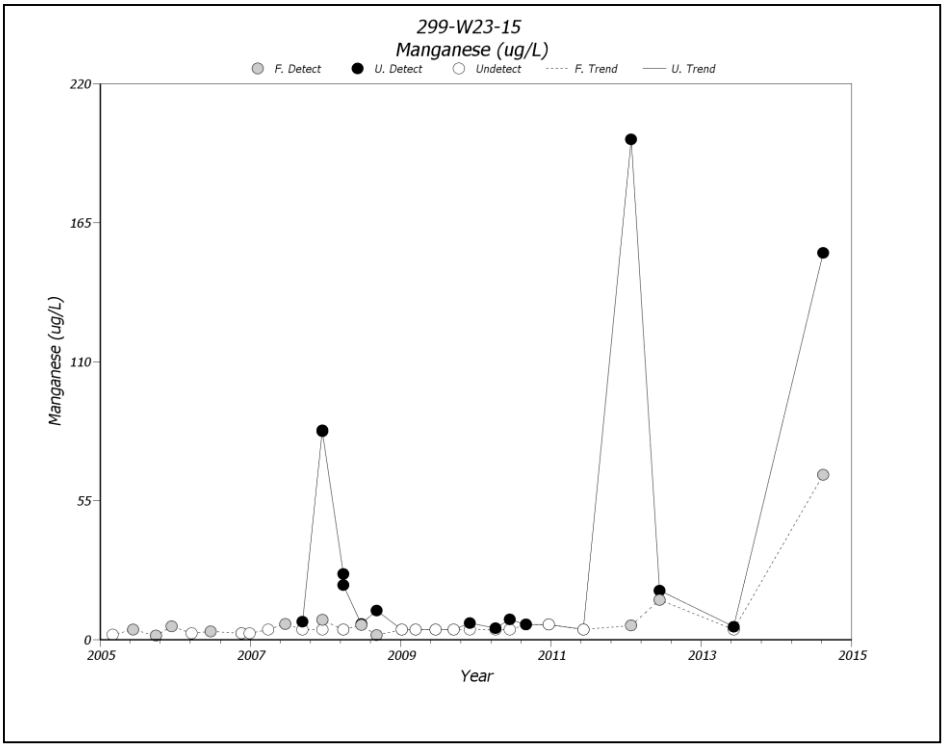

Figure 14. Manganese in Well 299-W23-15

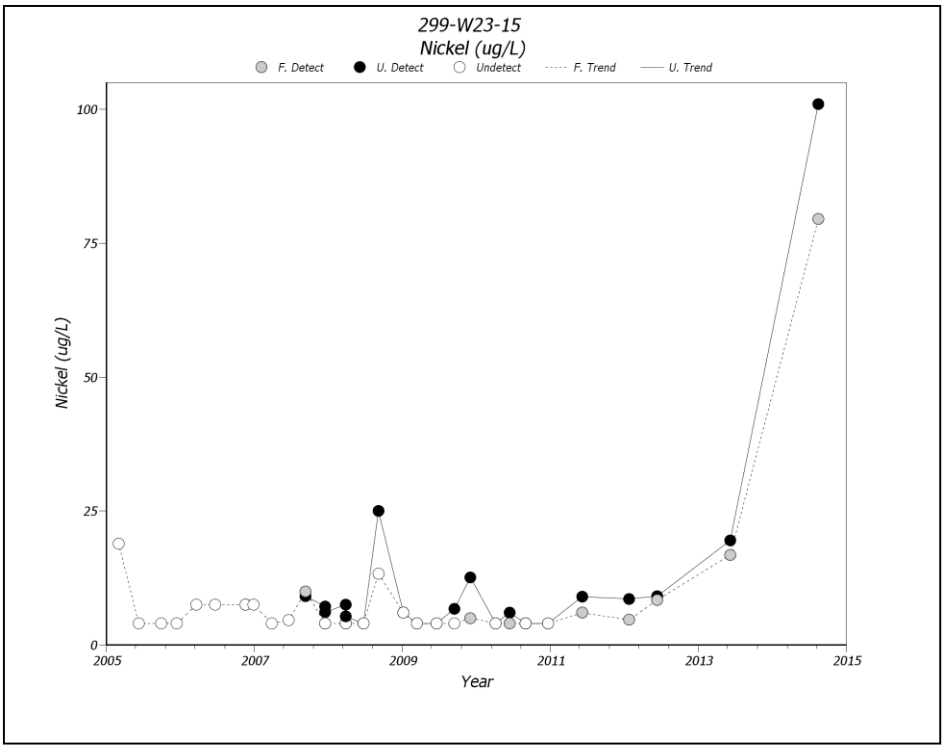

Figure 15. Nickel in Well 299-W23-15

5.5 SST WMA T (Interim Status, Assessment Monitoring)

Four wells were successfully sampled as scheduled in August and results were loaded into HEIS. The next scheduled sampling event is in November 2014.

Changes in concentrations of all analytes are expected as a result of the nearby 200 West extraction wells extracting contaminated groundwater upgradient and downgradient of WMA T. Figures 16 through 21 illustrate the decreasing trends in Cr(VI) and nitrate concentrations observed in the monitoring wells. Wells 299-W10-1 and 299-W10-28 are upgradient monitoring wells.

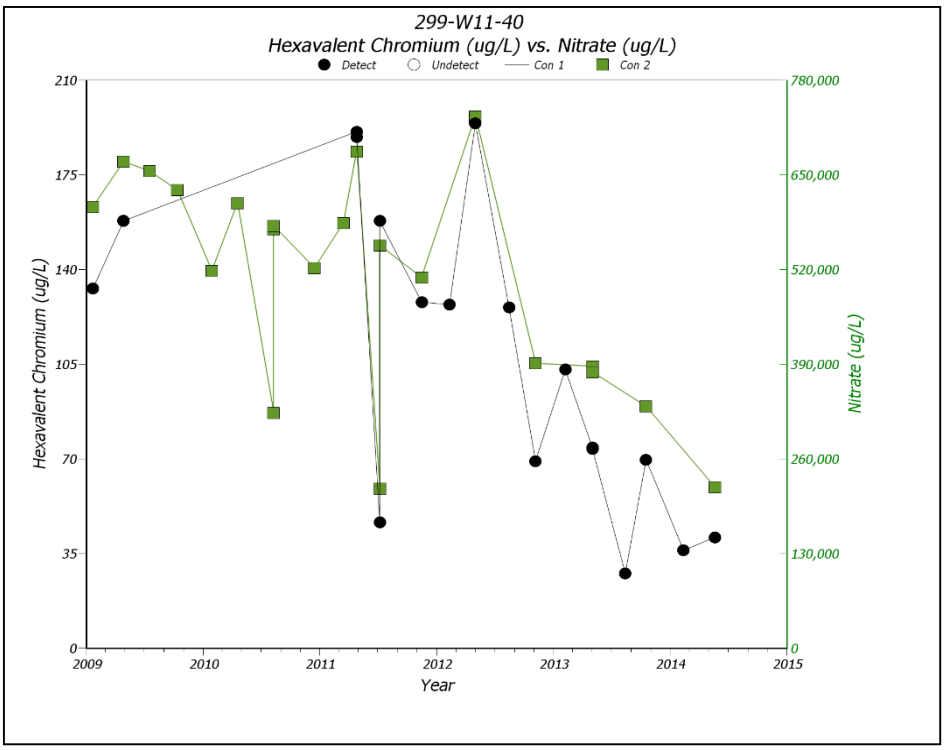

Figure 16. Hexavalent Chromium and Nitrate in Well 299-W11-40

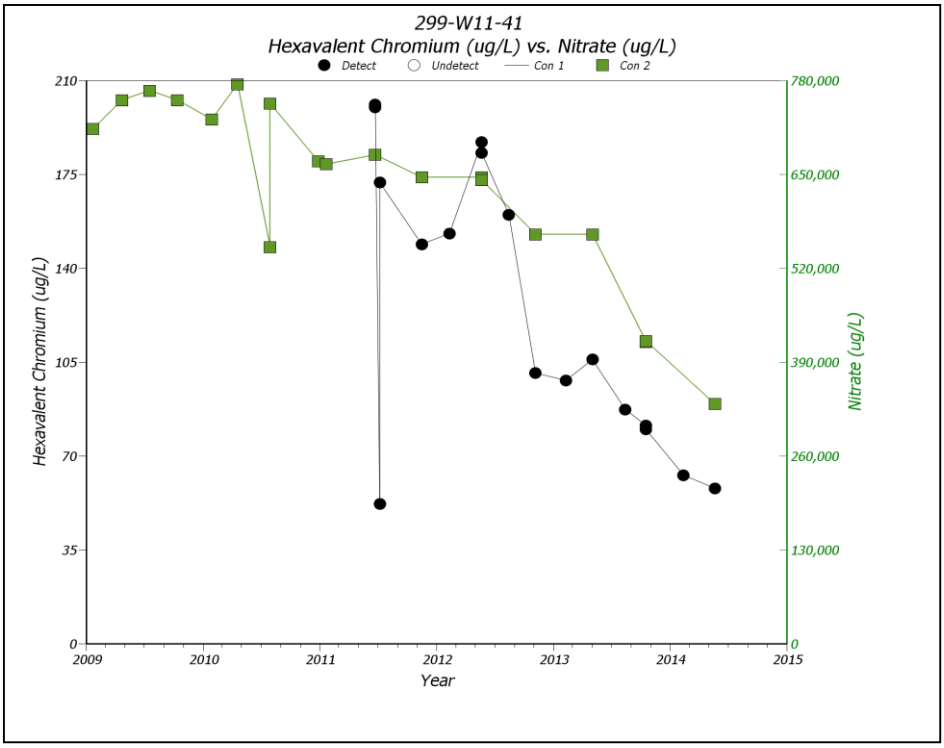

Figure 17. Hexavalent Chromium and Nitrate in Well 299-W11-41

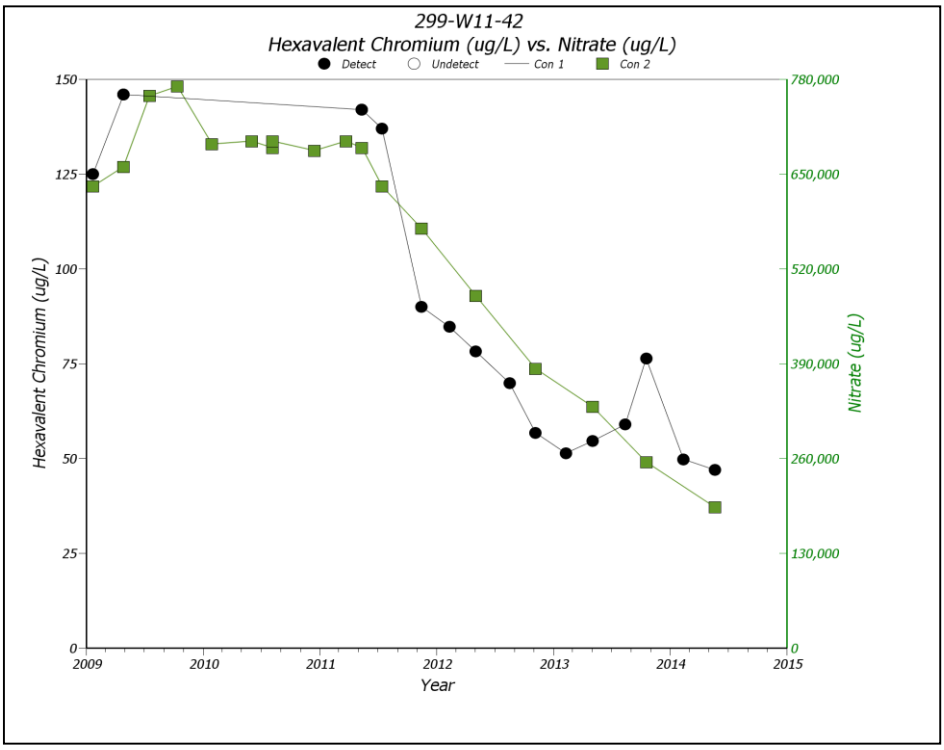

Figure 18. Hexavalent Chromium and Nitrate in Well 299-W11-42

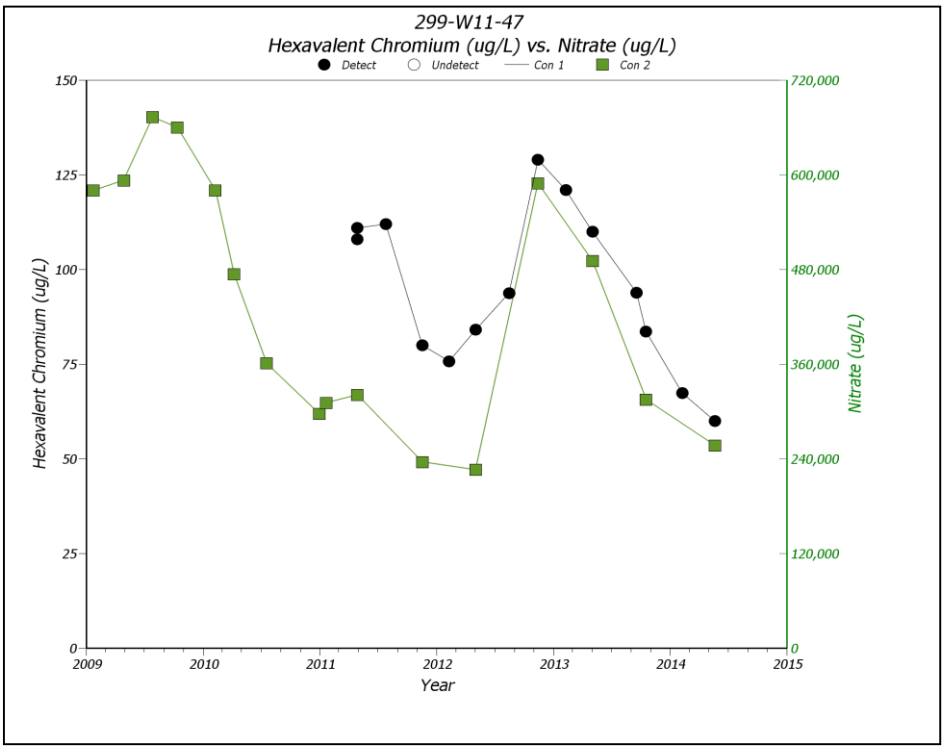

Figure 19. Hexavalent Chromium and Nitrate in Well 299-W11-47

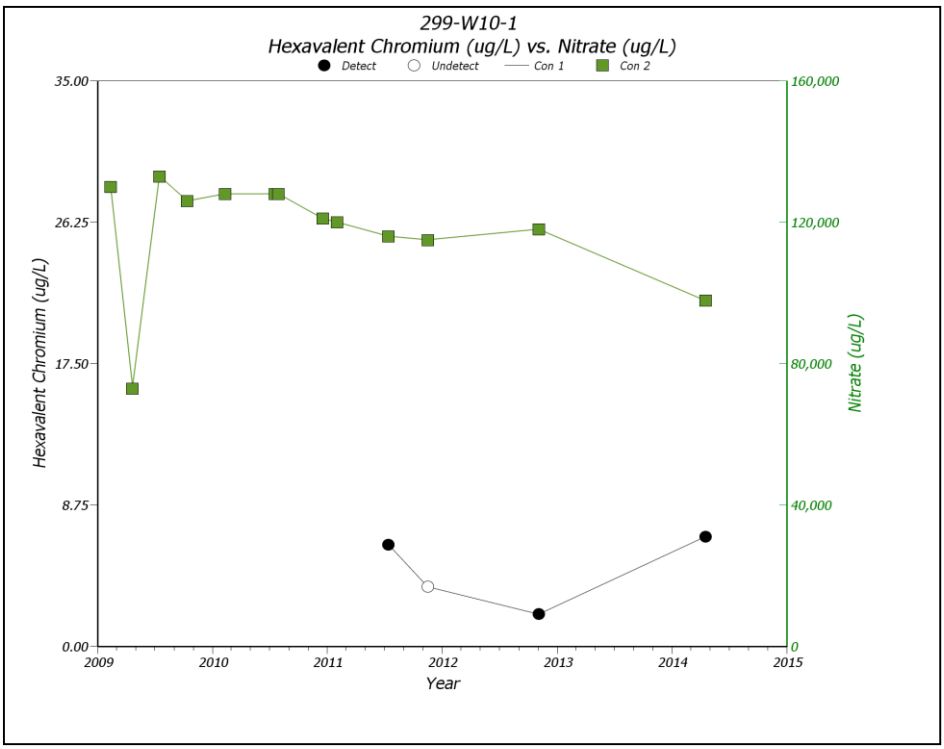

Figure 20. Hexavalent Chromium and Nitrate in Well 299-W10-1

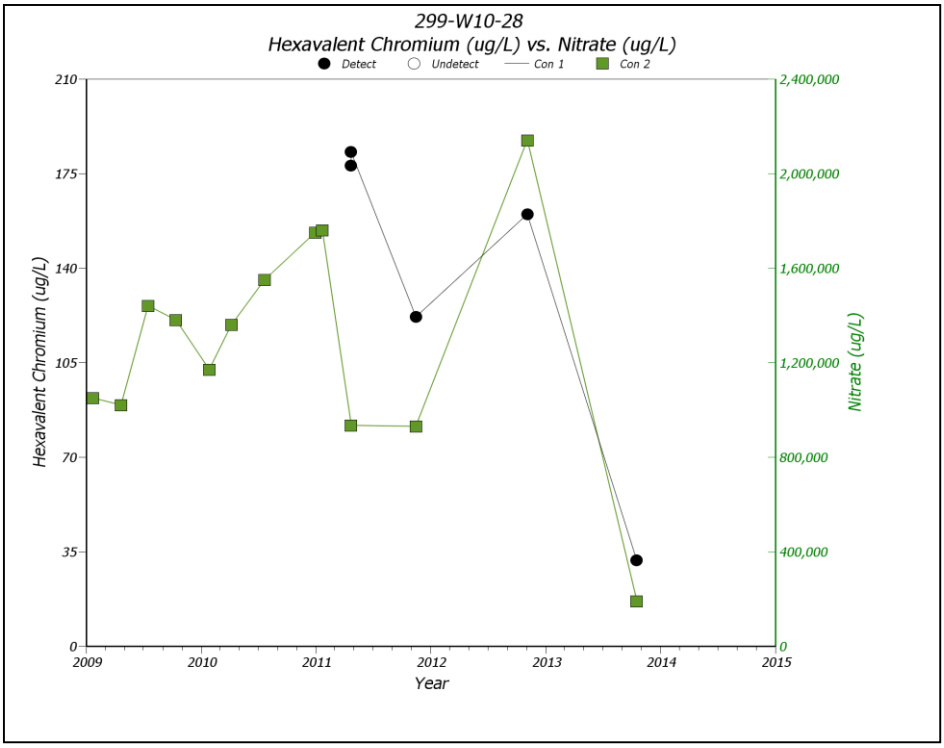

Figure 21. Hexavalent Chromium and Nitrate in Well 299-W10-28

5.6 SST WMA TX-TY (Interim Status, Assessment Monitoring)

Five wells were successfully sampled as scheduled in August and results were loaded into HEIS. Results are on trend, (Table 4), with slight Cr(VI) increases in three wells (299-W10-26, 299-W14-14, and 299-W14-18) and slight decreases in two wells (299-W10-27 and 299-W14-15). Table 4 illustrates the annual averages in all of the monitoring wells between 2013 through August 2014. The next scheduled sampling is November 2014.

Table 4. WMA TX-TY Assessment Sampling Summary 2014 Compared to 2013

Well Name	Cr(VI) (µg/L)		pH		Specific Conductance (µS/cm)		Dissolved Oxygen (µg/L)		Turbidity (NTU)	
	2014	2013	2014	2013	2014	2013	2014	2013	2014	2013
299-W10-26	117	106	7.59	7.64	1,238	1,525	8,313	7,930	0.63	1.32
299-W10-27	30	56	7.97	8.01	1,002	1,622	10,857	10,810	185	4.90
299-W14-11	29	28	7.71	7.60	879	749	8,420	8,920	0.47	1.15
299-W14-13	16	18	7.68	7.76	1,173	762	8,550	8,278	2.60	8.09
299-W14-14	11	6	7.92	7.97	696	664	9,220	9,035	1.21	2.60
299-W14-15	9	16	7.48	7.78	769	733	8,610	8,463	2.21	2.41
299-W14-18	29	9	7.56	7.60	944	824	10,183	6,980	9.62	11.38
299-W14-19	9	7	7.91	7.83	617	664	8,780	9,065	3.28	2.58
299-W15-44	≤8	6	7.96	7.88	489	490	8,450	8,695	0.63	2.48

Table 4. WMA TX-TY Assessment Sampling Summary 2014 Compared to 2013

Well Name	Cr(VI) (µg/L)		pH		Specific Conductance (µS/cm)		Dissolved Oxygen (µg/L)		Turbidity (NTU)	
	2014	2013	2014	2013	2014	2013	2014	2013	2014	2013
299-W15-763	10	5	8.08	7.94	594	926	9,320	11,050	10.6	3.06
299-W15-765	30	31	7.68	7.77	505	587	9,070	8,915	2.93	3.81

NTU = nephelometric turbidity unit

5.7 SST WMA U (Interim Status, Assessment Monitoring)

Three wells were sampled as scheduled during July and results were loaded into HEIS during the quarter. The next scheduled sampling is October 2014.

All chromium and nitrate concentrations were on trend for the July sampling. Chromium concentrations ranged from 5.3 to 12.3 µg/L, and nitrate concentrations ranged from 67.7 to 102 mg/L.

6 Active Waste Management Areas

Permitted WMAs are monitored to determine whether dangerous waste or dangerous waste constituents from the waste sites have entered the groundwater. Summary status and monitoring highlights of results by exception are provided for each area for the quarterly reporting period.

6.1 Integrated Disposal Facility (Final Status, Detection Monitoring)

Semiannual sampling conducted for collection of AEA monitoring constituents was completed for all seven network wells as scheduled in July and results were received during the quarter. The next annual sampling event for RCRA indicator parameters is scheduled for January 2015.

6.2 Liquid Effluent Retention Facility (Final Status, Detection Monitoring)

Wells 299-E26-14, 299-E26-77, and 299-E26-79 were sampled on July 31. The wells sampled are identified in DOE/RL-2013-46, *Groundwater Monitoring Plan for the Liquid Effluent Retention Facility*. Wells 299-E26-14 and 299-E26-79 are the upgradient and downgradient wells, respectively. Well 299-E26-77 is sampled for geochemical parameters, but not used for statistical measurements. None of the July indicator parameter sample results exceeded the derived critical mean values as discussed below and provided in Table 5. The next semiannual sampling event is scheduled for January 2015.

The July 2014 sample results were compared to critical mean values. Carbon tetrachloride is an additional indicator parameter and the July 2014 sample results were below detection limits (<0.3 µg/L). In addition, the other nineteen volatile organic constituents associated with the carbon tetrachloride results were reported below the detection limits, except for methylene chloride which is a lab contaminant. Cr(VI) is also being evaluated as a future indicator parameter. The July 2014 results for Cr(VI) were less than detection (<8 µg/L) at both the upgradient and downgradient wells.

TOC results were reported below the critical mean for both upgradient and downgradient monitoring wells. TOC concentrations are increasing in the upgradient well indicating migration through the aquifer from an upgradient location. The migrating TOC may have originated near Well 299-E34-7, located to the west, as similar increases in TOC concentrations were seen in this well approximately fifteen years earlier (Figure 22).

TOX results are variable and near the detection limit for TOX. Although the concentrations are variable they have always been below the LOQ. The last LOQ for TOX was for the period from April 2013 to April 2014 (18.3 µg/L). Since April 2014, samples have been diverted to new contract laboratories as the WSCF laboratory was preparing for closure. Once sufficient results are completed for TOX, new LOQs will be established.

Table 5. LERF 2014 Derived Indicator Parameter Critical Mean Comparison

Indicator Parameter	Critical Mean	Well 299-E26-14 (upgradient)	Well 299-E26-79 (downgradient)
pH	<7.42 and >8.15	7.88	7.96
Specific Conductance	1,005 µS/cm	771 µS/cm	699 µS/cm
TOC	3,376 µg/L	3,280 µg/L	741 µg/L
TOX	11.07µg/L	4.15 µg/L	3.4 µg/L
LERF = Liquid Effluent Retention Facility			

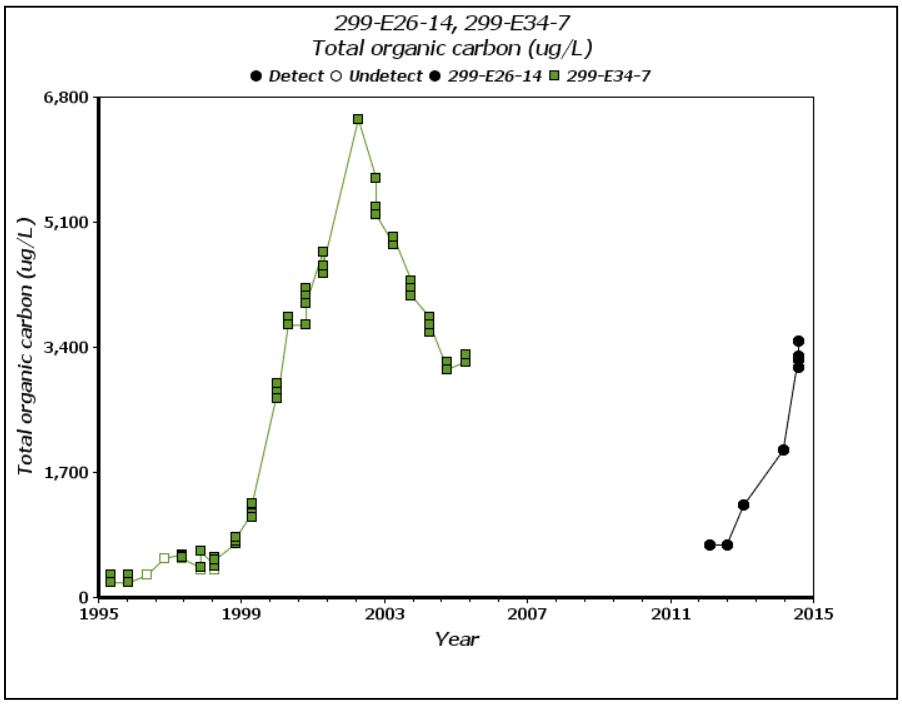

Figure 22. TOC trend in Upgradient Well 299-E26-14 and Past TOC Trend in Well 299-E34-7

6.3 LLWMA-1 (Interim Status, Indicator Evaluation Monitoring)

All eighteen wells were sampled in July as scheduled. Contamination indicator parameter results were below the critical mean values, except TOC in one well. The next semiannual sampling event is scheduled for January 2015.

Elevated TOC at Well 299-E33-265 initiated an assessment in 2012 and TOC has been elevated since 2012. The assessment found no dangerous waste constituents associated with the 218-E-10 Burial Ground (DOE/RL-2013-25, *First Determination RCRA Groundwater Quality Assessment Report for Low-Level Burial Grounds Low-Level Waste Management Area-1*). DOE/RL-2013-25 recommended reinstating the

previous groundwater monitoring plan (DOE/RL-2009-75, *Interim Status Groundwater Monitoring Plan for the LLBG WMA-1*). As a result of the assessment findings, the continued TOC exceedance is not cause for re-entering assessment. Therefore, no verification sample or assessment was initiated.

Nitrate exceeded the DWS in all but three wells in July. The nitrate concentrations are decreasing across the site and concentrations on the west side of the monitoring network have decreased beneath the DWS. The nitrate is associated with past groundwater migration from sources ranging from the south to the east.

6.4 LLWMA-2 (Interim Status, Indicator Evaluation Monitoring)

No sampling was scheduled during the quarter. The next scheduled semiannual sampling is October 2014.

6.5 LLWMA-3 (Interim Status, Indicator Evaluation Monitoring)

All four wells were successfully sampled as scheduled in September, and results are on trend. The next sampling event is scheduled for March 2015.

Concentrations of indicator parameters did not exceed their critical mean values during the reporting period except for specific conductance in 299-W10-31. Specific conductance measurements from 299-W10-31 exceeded the critical mean value of 448 µS/cm, with average values of 473 µS/cm for the September 5 samples. As reported in previous years' Hanford Site groundwater monitoring reports, the specific conductance trend at 299-W10-31 is presumed to be related to the increasing nitrate concentrations at this well, likely caused by movement of the regional nitrate plume.

6.6 LLWMA-4 (Interim Status, Indicator Evaluation Monitoring)

Seven wells were sampled as scheduled in July, results were loaded into HEIS and all are on trend. The next scheduled sampling event is January 2015.

Specific conductance, pH, TOC, and TOX in downgradient wells were below their critical mean values for all wells during the reporting period. In 2014, TOX and TOC results increased compared to 2013 results.

7 References

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