2018 ANNUAL ENVIRONMENTAL MONITORING REPORT

INMAN LANDFILL

14506 Allen West Road
Bow, Washington

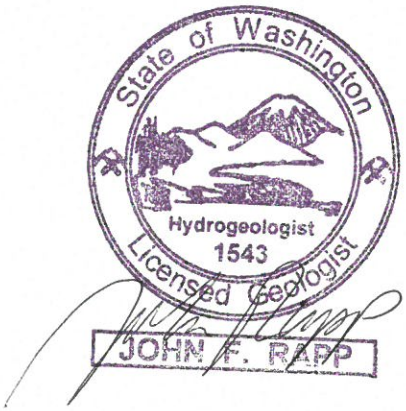
Prepared by:

Skagit County Public Works Department
1800 Continental Place
Mount Vernon, Washington 98273-5625

March 2019

2018 Annual Environmental Monitoring Report
Inman Landfill
Skagit County, Washington

Prepared by:



John F. Rapp, LG, LHg

Skagit County Public Works Department
1800 Continental Place
Mount Vernon, Washington 98273-5625

March 2019

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICIES

1.0 INTRODUCTION

This report presents a summary of environmental monitoring data collected during 2018 at the Inman Landfill. Annual reporting of environmental monitoring data is required by *Minimum Functional Standards for Solid Waste Handling* (Chapter 173-304 Washington Administrative Code [WAC]) and *Special Incinerator Ash Management Standards* (Chapter 173-306 WAC). This annual monitoring report includes a summary of leachate generation, groundwater quality and flow characteristics, landfill gas extraction system operations, methane concentrations measured in perimeter gas probes, and surface water quality.

1.1. Site Background

Inman Landfill is located in the northwestern portion of Skagit County, approximately 7.5 miles northwest of Mount Vernon, Washington (Figure 1). The site occupies a former gravel pit and was operated as a solid waste disposal facility by Skagit County beginning in 1973. The site stopped accepting waste in April 1994 and closure construction was completed in 1995.

Solid waste was first disposed in an unlined area covering approximately 16 acres in the eastern portion of the site (Phase I). Beginning in 1986, solid waste was disposed in a lined portion of the site (Phase II), which covers approximately 10 acres, part of which overlaps the Phase I area. Incinerator ash was also disposed in the lined (Phase II) area. The lined portion of the site includes a combination of composite, geomembrane, and soil liner systems. The leachate collection system consists of a series of perforated pipes placed above the bottom liner. The perforated pipes collect and route leachate through a pump station to a lined aeration pond where it is subsequently hauled to a local wastewater treatment plant for disposal.

1.2. Landfill Closure

The landfill stopped receiving waste on April 8, 1994. Closure activities followed in accordance with the approved closure plans. An assessment of potential contaminant sources was conducted in response to the detection of groundwater impacts in the landfill monitoring wells. Based on the results of this assessment, several corrective actions were incorporated into the final closure design to reduce or eliminate identified potential contaminant sources and to protect public health. Corrective actions implemented during and after closure included:

- Relining the leachate aeration pond and upgrading the pump station.
- Improving the surface water collection, conveyance, and storage facilities.
- Recapping the Phase I portion of the landfill with a cover that exceeded the standards required at the time.
- Connecting surrounding homes to a public water system and abandoning drinking water wells.

In addition to these corrective actions, closure activities also included the construction of a landfill gas (LFG) extraction system and expansion of the perimeter gas monitoring probe network. The LFG extraction system has operated since closure to alleviate the accumulation of methane beneath the landfill cap and to control off-site methane migration.

These measures were intended to reduce leachate generation by reducing surface water infiltration, minimizing the potential transport of contaminants in the gas stream into groundwater, and eliminating suspected groundwater contaminant sources and potential exposure pathways. Since closure was completed, these actions have resulted in a gradual long-term decrease in leachate generation and a long-term improvement of groundwater quality as discussed in subsequent sections of this report.

2.0 LEACHATE

2.1. Leachate Collection System Operation

Post-closure activities at Inman Landfill include operation of a leachate collection system. The leachate collection system consists of a network of drain pipes situated under the newer (Phase II) portion of the landfill. These drain pipes lead to a single concrete sump and pump station (PS#1). Leachate enters the sump and is pumped up to a double-lined leachate collection pond. Leachate in the pond is pre-treated with aerators. The pre-treated leachate is periodically pumped from the pond and hauled to the City of Mount Vernon wastewater treatment plant for disposal as authorized by a State Wastewater Discharge Permit.

2.2. Leachate Generation

The amount of leachate collected from the lined, Phase II portion of the landfill generally increased each year until closure in 1994 (Figure 2). Since 1994 leachate generation has generally decreased. In 2006, leachate generation was 3 percent of the amount collected during 1991 and 1992, which was prior to installation of the landfill cover system. Leachate generation rates leveled off approximately twelve years ago, and then decreased again from 2002 through 2005 before increasing in 2007. There was an approximate four-fold increase between 2006 and 2007; this increase was due to the complete draining of the leachate pond during the third quarter of 2007 for cleaning and repair. In 2018, leachate was produced in quantities similar to those from 1997 to 2001, and 2007 to 2017.

The stabilization of leachate generation rates during the late 1990s may indicate the removal of easily-drained leachate that entered the landfill prior to construction of the existing cover system. One point that is clear from the graph is that the landfill cover has been effective in reducing the amount of precipitation entering the landfill and, consequently the amount of leachate that is generated.

The Phase I area of the landfill does not have a bottom liner and therefore, no leachate collection system. A significant amount of leachate generated from this portion of the site does potentially reach the underlying groundwater system. However, since the landfill cover system placed over the Phase I area is similar to that placed over the Phase II area, it is reasonable to assume that potential leachate generated from the Phase I area has also decreased in amounts proportional to those observed for the Phase II area.

3.0 HYDROGEOLOGY

Inman Landfill is located on the north side of Bay View Ridge. Bay View Ridge is composed of a series of glacial and glaciomarine deposits and rises up to 200 feet above the surrounding delta valleys. A previous investigation concludes that the Inman Landfill site is underlain by two aquifers (Sweet Edwards & Associates 1987). These aquifers consist of a shallow, unconfined perched aquifer that is typically located above sea level, and a deeper regional aquifer (referred to as the upper regional aquifer or the regional aquifer) that is situated near or below sea level. The shallow perched aquifer occurs in a sand unit that is situated above a dense silt/clay layer at elevations of approximately 1 to 13 feet above sea level. The silt/clay layer appears to dip to the west and southwest into Bay View Ridge. Monitoring Wells B-6, B-7, B-8, B-9, B-11, and B-13 and Gas Probe GP-6 are screened in the perched aquifer (Figure 3). Previous groundwater measurements in these wells indicate that groundwater in this aquifer follows the dip of the silt/clay layer and flows generally to the southwest into Bay View Ridge.

The upper regional aquifer is located in fine to coarse sand deposits that are present beneath the silt/clay layer (Sweet Edwards & Associates 1987). The upper regional aquifer is confined by the overlying silt/clay layer. The top of this aquifer is reportedly situated at elevations ranging from 6 to 14 feet below sea level. Monitoring Wells B-1, B-2, B-3, B-4, B-5, B-10, and B-12 are screened in the upper regional aquifer (Figure 4). Previous groundwater measurements in these wells indicate that groundwater in this aquifer flows in a radial pattern away from Bay View Ridge to the north, northeast, and east.

Water level measurements were collected during four quarterly monitoring events during 2018 (March, June, September, and December) from monitoring wells completed within each aquifer. Based on the measured water levels, computer-generated potentiometric surface maps were created for each aquifer for each of these quarters (Figures 3a-3d, 4a-4d). These maps were prepared with the kriging method in the Surfer™ 8.0 contouring software package using elevations from the monitoring wells in each aquifer (Table 1 & 2). Wells B-7 and B-11 were dry during each of the measuring events in 2018; therefore, these wells were not used to construct the water table contour map. Hydrographs of groundwater elevations collected since landfill closure for both aquifers were also prepared (Figures 5 & 6).

3.1. Perched Aquifer

Static water level elevations measured in 2018 for the perched aquifer ranged from 8.18 feet above mean sea level (amsl) to 14.48 feet amsl (Table 1).

Table 1. 2018 Static Water Level Elevations: Perched Aquifer

Well	March	June	September	December
B-6	12.34	11.87	11.24	10.80
B-7	Dry	Dry	Dry	Dry
B-8	13.78	12.98	10.48	14.48
B-9	10.85	10.75	10.34	10.12
B-11	8.18	8.68	8.66	9.18
B-13	12.76	12.69	12.69	11.76
GP-6	11.97	13.43	13.73	11.84

Elevations are in feet above mean sea level (NGVD 29)

The water table contour maps indicate that perched groundwater flow was fairly consistent during 2018, flowing from the north and northeast, and moving through the site in a southwesterly direction (Figures 3a-3d). Local groundwater velocities can be variable because of the complex local groundwater flow patterns. For simplicity, the average groundwater velocity across the site within this aquifer was calculated using gradients observed across the central and southern portions of the site.

Based on these criteria, the average gradient in 2018 ranged from about 0.0017 to 0.0030 feet per foot (ft/ft), with an average gradient of approximately 0.0024 ft/ft. The average porosity of the perched aquifer material was estimated to be approximately 27.5 percent and the hydraulic conductivity was estimated to be approximately 28 feet per day (ft/day) (Sweet Edwards & Associates 1987). These parameters were used in conjunction with the average hydraulic gradient of 0.0024 ft/ft to estimate the average linear velocity of groundwater in the perched aquifer using Darcy's Law, where: **V = Ki/n,** and

V = average linear velocity,
K = hydraulic conductivity,
i = hydraulic gradient, and
n = porosity.

This calculation indicates that the average linear velocity of groundwater in the perched aquifer during 2018 was approximately 0.25 ft/day.

A review of the hydrograph for the perched aquifer (Figure 5) shows that the water levels fluctuate in a typical seasonal manner. Prior to 2004 the hydrograph shows an overall slightly decreasing trend in all of the wells since 1995; however, the 2004 through 2018 measurements indicate that this decreasing trend has stabilized. The decreasing trend may be a result of reduced infiltration of rainwater over the landfill since construction of the cap was completed in 1995.

3.2. Upper Regional Aquifer

Static water level elevations measured in 2018 for the upper regional aquifer ranged from 1.55 feet amsl to 9.21 feet amsl (Table 2).

Table 2. 2018 Static Water Level Elevations: Upper Regional Aquifer

Well	March	June	September	December
B-1	9.04	9.01	8.58	8.33
B-2	9.69	9.04	8.89	8.54
B-3	8.90	8.60	8.13	8.05
B-4	9.31	8.91	8.78	8.42
B-5	4.04	2.14	2.14	3.72
B-10	9.36	8.97	8.86	8.46
B-12	8.87	8.70	8.20	8.04

Elevations are in feet above mean sea level (NGVD 29)

The water table contour maps for 2018 indicate that the upper regional aquifer groundwater generally flowed from the west and southwest to the east and northeast (Figures 4a-4d). Using the information in these maps, hydraulic gradients were calculated between Well B-10, the most upgradient well, and Well B-12, the most downgradient well for the majority of the monitoring events. The calculated hydraulic

gradients from Well B-10 to Well B-12 for 2018 ranged from 0.0002 to 0.0004 ft/ft, with an average of approximately 0.0003 ft/ft.

In addition to the construction of the potentiometric surface maps, groundwater elevations were also used to calculate estimated groundwater flow velocities for the upper regional aquifer. Because of the similarity in material in the perched and upper regional aquifers, the same values for porosity and hydraulic conductivity used for the perched aquifer were also used for the upper regional aquifer. These parameters were used in conjunction with the average hydraulic gradient for 2018 of 0.0003 ft/ft (calculated previously) to estimate the average linear velocity of groundwater in the upper regional aquifer using Darcy's Law. The result of this calculation indicates that the average linear velocity of groundwater in the upper regional aquifer during 2018 was approximately 0.026 ft/day across the central landfill site.

In addition to the potentiometric surface map showing the central landfill area, potentiometric surface maps were also prepared showing groundwater contours beyond the northern and eastern boundaries of the landfill and into the topographically lower Samish River Valley (Figures 7a-7d). These maps were also prepared with the wells used for the central landfill area in addition to elevations from a single well located in the valley (Well B-5; refer to Table 2) and estimated groundwater elevations for points located along nearby Joe Leary Slough. Groundwater elevations along Joe Leary Slough were estimated using the elevation of surface water measured in the slough. It should be noted that water level elevations in both the slough and in Well B-5 show significant tidal influence.

The flow pattern in the upper regional aquifer continues to be a radial flow into the Samish River valley, although the hydraulic gradient appears to increase significantly as groundwater enters the Samish River Valley from the central landfill area. Also, flow in the upper regional aquifer appears more radial than in the perched aquifer, flowing from the western side of the site toward the north, northeast, and east.

Hydraulic gradients were calculated from the west side of the landfill and extending into the valley. The gradients were calculated using the groundwater elevations measured at Well B-10, located in the southwestern portion of the site, and Well B-5, which is located in the valley and downgradient of Well B-10. The gradients calculated between these two points ranged from approximately 0.0013 to 0.0018 ft/ft during 2018, with an average of approximately 0.0015 ft/ft. This gradient is steeper than that calculated for the central landfill area because it combines the flatter gradient beneath the landfill with the steeper gradient measured between the landfill proper and the Samish Valley. As noted above, this gradient is significantly influenced by the tide. Using this average hydraulic gradient and the aquifer parameters presented above, the resulting average linear velocity of groundwater in the upper regional aquifer across the landfill area and into the Samish Valley in 2018 was approximately 0.29 ft/day.

A review of the hydrograph for the upper regional aquifer (Figure 6) shows that the water levels fluctuate in a typical seasonal manner. Well B-5 shows the greatest variation of all wells in the upper regional aquifer, but this variation is likely a reflection of different tidal stages in which measurements are made and is to a lesser extent due to seasonal variation. Prior to 2004 the hydrograph shows an overall slightly decreasing trend in all of the wells except Well B-5; however, since 2004 generally water levels have stabilized. The decreasing trend may be a result of reduced infiltration of rainwater over the landfill since construction of the cap was completed in 1995.

4.0 GROUNDWATER SAMPLING METHODS

4.1. Sample Locations and Frequency

Groundwater sampling at Inman Landfill is conducted on a quarterly basis. The Inman Landfill groundwater monitoring network consists of 13 monitoring wells: seven wells screened in the upper regional aquifer (B-1, B-2, B-3, B-4, B-5, B-10, and B-12), and six wells screened in the perched aquifer (B-6, B-7, B-8, B-9, B-11, and B-13). Quarterly sampling in 2018 was conducted in March, June, September, and December. Well B-7 has been dry for over 20 years and has not been sampled since landfill closure in 1994. Similarly, the water level in Well B-11 had been below the pump from 2001 through 2005, except for in June 2005. However, in 2006, the pump was adjusted in a manner that allowed the collection of samples from Well B-11 during each monitoring event since the adjustment. Declining water levels in the perched aquifer prevented sample collection at Wells B-8, B-11, and B-13 during the 2018 sampling events. Monitoring well B-8 was last sampled during the second quarter of 2017 (June 2017). Monitoring well B-11 was last sampled during the first quarter of 2017 (March 2017). Monitoring well B-13 was last sampled during the fourth quarter of 2010 (December 2010).

4.2. Sample Collection

All monitoring wells were purged and sampled in accordance with the *Quality Assurance Project Plan* (QAPP) for Inman Landfill (Skagit County Public Works (SCPW) Dept., 2010).

4.3. Analytical Parameters

Groundwater samples were submitted to Edge Analytical of Burlington, Washington for analysis. Parameters tested consisted of analytes specified in the QAPP (SCPW Dept., 2010). Beginning with the second quarter of 2008 sampling event, additional parameters were tested during each subsequent quarterly sampling event. These additional parameters were measured for a two year period based on a request from the Washington Department of Ecology to further characterize groundwater at the landfill site. These additional parameters were measured for the last time during the first quarter 2010 monitoring event. These additional parameters included total dissolved solids (TDS), alkalinity, bicarbonate, total calcium, total magnesium, total potassium, total sodium, and the following dissolved metals: antimony, barium, beryllium, cobalt, copper, nickel, selenium, silver, thallium, and vanadium.

Based on a subsequent request from the Washington Department of Ecology, most of these additional parameters were sampled again beginning in the third quarter of 2011. The parameters that were never detected above practical quantitation limits during the 2008 to 2010 sampling rounds were dropped from the sampling request. The additional parameters from the most recent request included TDS, alkalinity, bicarbonate, total magnesium, total potassium, and the following dissolved metals: antimony, barium, chromium, cobalt, copper, nickel, selenium, and vanadium. For quality assurance purposes, duplicate samples were collected from Well B-3 during each sampling round.

5.0 GROUNDWATER QUALITY RESULTS

A discussion of groundwater quality based on analytical results from the monitoring well network is presented in this section. Separate discussions are included for the perched and upper regional aquifers, respectively. A background well has not been established for either the perched aquifer or the upper regional aquifer monitoring networks because of apparent or potential landfill impacts at each monitoring well location as indicated by historical monitoring results.

Tabulated groundwater monitoring results for 2018 are presented in Appendices A-1 and B-1 for the perched and upper regional aquifers, respectively. Time-series plots were generated from data collected from 1994 through 2018 (95 sampling events). Thirty-long-term time-series plots (Appendix A-2) were generated from the perched aquifer analytical results. Twenty-seven long-term time-series plots (Appendix B-2) were generated from the upper regional aquifer analytical results. Time-series plots were not generated for parameters when the results were all or nearly all detected at levels below the laboratory practical quantitation limits (PQLs).

For quality assurance purposes, a data validation report was generated that reviews laboratory groundwater quality data from the sampling event. The fourth quarter data validation report is presented in Appendix C.

5.1. Perched Aquifer

The perched aquifer monitoring system for the site is comprised of Monitoring Wells B-6, B-7, B-8, B-9, B-11, and B-13. As mentioned in Section 4.1, only monitoring wells B-6 and B-9 had sufficient water to collect representative groundwater samples during the four quarterly sampling events in 2018. One analyte was found to exceed state groundwater standards (Chapter 173-200 WAC) in the perched aquifer during 2018 (Table 3).

Table 3. Summary of Maximum Concentrations of Analytes Exceeding Groundwater Quality Standards in Perched Aquifer Wells: 2018

Contaminant	GW Quality Standards (173-200 WAC)	B-6	B-9
Carcinogen			
Arsenic (mg/L)	0.00005	0.0007	0.0009
Vinyl Chloride (µg/L)	0.02	NE	NE

NE: Not exceeded

The 2018 analytical data indicate that elevated concentrations of dissolved arsenic tended to be widespread, with exceedances of the water quality standards occurring in each of the perched aquifer wells sampled.

5.2. Upper Regional Aquifer

The upper regional aquifer monitoring well network comprises Wells B-1, B-2, B-3, B-4, B-5, B-10, and B-12. Except for monitoring well B-10 which was not sampled during the first quarter (March 2018), all wells were sampled during each of the four quarterly sampling events in 2018. Seven wells were found to exceed state groundwater standards (Chapter 173-200 WAC) for at least one sampling event during 2018 in the upper regional aquifer (Table 4).

Table 4. Summary of Maximum Concentrations of Analytes Exceeding Groundwater Quality Standards in Upper Regional Aquifer Wells: 2018

Contaminant	GW Quality Standards (173-200 WAC)	Maximum Concentration Detected						
		B-1	B-2	B-3	B-4	B-5	B-10	B-12
Carcinogen								
Arsenic, dissolved (mg/L)	0.00005	0.064	0.001	0.004	0.046	0.004	0.002	0.005
Vinyl chloride (µg/L)	0.02	NE	NE	0.137	0.021	0.137	NE	NE
Secondary								
Iron, dissolved (mg/L)	0.3	1.88	NE	12.50	6.49	19.6	1.70	0.64
Manganese, dissolved (mg/L)	0.05	2.05	NE	0.876	1.68	2.54	0.436	0.10
pH (standard units)	6.5-8.5	NE	5.66	8.93	NE	NE	NE	NE
Total dissolved solids (mg/L)	500	NE	NE	NE	697	NE	NE	NE

NE: Not exceeded

The 2018 analytical data for the upper regional aquifer show areal distribution trends that are somewhat similar to those observed in the perched aquifer. For instance, elevated concentrations of metals, tended to be widespread, with exceedances of water quality standards for dissolved arsenic, iron, and manganese occurring in almost all of the upper regional aquifer wells. Vinyl chloride concentrations tended to be more localized in the upper regional aquifer in 2018, with water quality standards exceeded in only two wells (B-3, B-4, and B-5), which are located in the northwestern and western margins of the landfill.

In general, concentrations of all analytes tended to be lower in upgradient wells (B-1, B-10, and B-12) and higher in downgradient wells (B-2, B-3, B-4, and B-5), as would be expected. VOCs were not detected above PQLs in either well B-1, B-2, B-10, or B-12, during any of the 2018 monitoring events.

5.3. Domestic Wells

No domestic wells were sampled in 2018. Domestic wells located to the southwest and southeast of the landfill site have been sampled previously. The results of these analyses were presented in earlier annual reports. Refer to those reports for a discussion of domestic well results.

6.0 STATISTICAL EVALUATION OF GROUNDWATER RESULTS

Statistical analysis of groundwater monitoring data from Sauk Landfill is conducted using Microsoft Excel and WQStat Plus v.9 or equivalent software in accordance with the EPA guidance document (EPA 2009). Statistical analysis is conducted using data from the entire monitoring period (1994-2018) unless otherwise noted.

6.1. Piper Diagrams

Piper diagrams are a graphical display of the proportions of the major cations and anions in a sample. Piper diagrams are constructed by plotting the proportions of the major cations (calcium, magnesium, sodium and potassium) on one triangular diagram, the proportions of the major anions (alkalinity, chloride, sulfate) on another, and then combining the information from the two triangular plots onto a quadrilateral plot (Drever 2002). A piper diagram was created using the data from each quarterly monitoring event in 2018 for both the perched aquifer (Appendix D-1) and the upper regional aquifer (Appendix E-1).

6.1.1. Perched Aquifer

The piper diagrams indicate that all the monitoring wells in the perched aquifer have similar chemical signatures. The results also show that general chemistry of the perched aquifer does not significantly change throughout the year.

6.1.2. Regional Aquifer

The piper diagrams indicate that the monitoring wells in the regional aquifer have mostly similar chemical signatures. Wells B-2, B-4, and B-5 do appear to each have their own slightly different chemical signature that varies from the rest of the monitoring wells. The results also indicate that the general chemistry of the upper regional aquifer does not significantly change throughout the year.

6.2. Stiff Diagrams

A stiff diagram is another graphical representation of the major ion composition of a water analysis. A polygonal shape is created from three horizontal axes extending on either side of a vertical axis. The three major anions are plotted to the right of the center axis and the three major cations are plotted to the left of the center axis. The points are connected to create the polygonal shape. The larger the area of the polygonal shape, the greater the concentrations of the analytes (Drever 2002). Stiff diagrams were produced for every well with the data from each quarterly monitoring event in 2018 for both the perched (Appendix D-2) and upper regional (Appendix E-2) aquifers.

6.2.1. Perched Aquifer

The polygons produced at each well are similar to each other in shape, but do vary in overall size. The polygon shapes and sizes remain similar for each quarterly monitoring event.

6.2.2. Upper Regional Aquifer

Generally, the polygons produced at each well are similar to each other, and are similar for each quarterly monitoring event. Well B-4 has the largest polygonal shape, which indicates that it has the greatest concentration of analytes.

6.3. Cation-Anion Balance

Cation-anion balance is the ratio of cations to anions within the water sample. Since water samples are electrically neutral, the sum of the cations should equal the sum of the anions. The cations are magnesium, calcium, sodium and potassium. The anions are sulfate, chloride, carbonate and bicarbonate. The ratio would be determined as:

Ratio = (sum of cations)/(sum of anions)*100%

Since water is electrically neutral, we would expect the ratio to be 1 or 100%. The cation-anion balance was calculated for the monitoring wells in each aquifer during every quarterly monitoring event of 2018. The results are displayed on the quarterly piper diagrams in Appendix D-1 and Appendix E-1.

The cation-anion balances calculated for each quarterly monitoring event in the perched aquifer are 18.59%, 12.36%, 2.98%, and 11.49%, respectively (Appendix D-1). The cation-anion balances calculated for each quarterly monitoring event in the upper regional aquifer are 11.37%, 8.84%, 6.34%, and 12.31%, respectively (Appendix E-1). These results indicate that there are more anions than cations in the results. There could be a couple of reasons for this ratio imbalance. One is the fact that some analyte values are for dissolved metals and some analyte values are for total metals. Another reason could be that not all species were analyzed in the water sample, and were therefore not included in the cation-anion balance. The most common species were analyzed, but there could be less common species present in the water that were not included in the calculation.

6.4. Box Plots

Box plots are useful in providing a visual display of the distribution of a data set (EPA 2009). The central box of the plot shows the interquartile range from the 25^{th} to the 75^{th} percentiles. A line (whisker) is drawn to the minimum and maximum values from the 25^{th} and 75^{th} percentiles, respectively. The 50^{th} percentile is drawn within the box. The mean value of the data set is plotted within the box as a separate mark. Significantly staggered boxes could be an indication of spatial variability.

Box-plots were created with data collected from 1994 through 2018 of all analytes with detections. 24 plots were created from the perched aquifer analytical results (Appendix D-3) and 31 plots were created from the upper regional aquifer analytical results (Appendix E-3). Box plots were not generated for parameters when the results were all or nearly all detected at levels below the laboratory practical quantitation limits.

The box plots were visually analyzed to see if there were significant differences between the wells (Table 5 & Table 6). A significant difference would be if one of the boxes in the plot did not overlap with any of the others. This significant difference could indicate that there are statistically different average concentrations between the wells.

6.4.1. Perched Aquifer

Seventeen out of the 31 analytes plotted had wells with statistically different average concentrations (Table 5). In 9 of the 17 analytes (alkalinity, dissolved barium, COD, chloride, magnesium, potassium, sodium, TDS, and TOC) the values measured in B-8 were significantly higher. B-9 is significantly higher in CFC-12. Dissolved iron and dissolved nickel were significantly higher in both B-8 and B-13. Calcium is significantly higher in B-6 and B-8, and nitrate is significantly higher in B-6 and B-11.

These results indicate that B-8 shows the most impacts from the landfill. B-13 shows some significant impacts. The results show some impacts in B-6, B-9, and B-13. However, it should be noted that only monitoring wells B-6 and B-9 have had sufficient water to collect samples since approximately early 2017.

Table 5. Summary of Box Plot Visual Analysis in Perched Aquifer Wells: 2018

Significantly Staggered Analyte	Distribution of Boxes
Alkalinity	B-8 is higher
Barium, dissolved	B-8 is higher
Calcium, total	B-6 and B-8 are higher
Chemical oxygen demand (COD)	B-8 is higher
Chloride	B-8 is higher
Bicarbonate	B-6 and B-8 are higher
Dichlorodifluoromethane (CFC-12)	B-9 is higher
Iron, dissolved	B-8 and B-13 are higher
Magnesium, total	B-8 is higher
Nickel, dissolved	B-8 and B-13 are higher
Nitrate-N	B-6 and B-11 are higher
Potassium, total	B-8 is higher
Sodium, total	B-8 is higher
Total dissolved solids (TDS)	B-8 is higher
Total organic carbon (TOC)	B-8 is higher

6.4.2. Upper Regional Aquifer

Fifteen out of the 31 analytes plotted had wells with statistically different average concentrations (Table 6). In 6 out of 15 analytes (alkalinity, dissolved barium, bicarbonate, Freon-22, magnesium, TDS), the values measured in B-4 were significantly higher than the values measured in the rest of the wells. In 3 out of the 15 analytes (CFC-12, nitrate-N, and potassium), the values measured in B-2 were significantly higher than the values measured in the rest of the wells. B-1 was significantly higher in one analyte (dissolved arsenic), and B-5 was significantly higher in three analytes (dissolved iron, dissolved nickel, and vinyl chloride). Wells B-3 and B-5 were both significantly higher in diethyl ether than the other wells. Wells B-4 and B-5 were both significantly higher in dissolved manganese than the other wells.

These results indicate that the B-2, B-4, and B-5 show the most impacts from the landfill. B-1 and B-3 were both significantly higher in one analyte each. B-12 was not significantly higher in any analyte in the upper regional aquifer.

Table 6. Summary of Box Plot Visual Analysis in Upper Regional Aquifer Wells: 2018

Significantly Staggered Analyte	Distribution of Boxes
Alkalinity	B-4 is higher
Arsenic, dissolved	B-1 is higher
Barium, dissolved	B-4 is higher
Bicarbonate	B-4 is higher
Chlorodifluoromethane (Freon 22)	B-4 is higher
Dichlorodifluoromethane (CFC-12)	B-2 is higher
Diethyl ether	B-3 and B-5 are higher
Iron, dissolved	B-5 is higher
Magnesium, total	B-4 is higher
Manganese, dissolved	B-4 and B-5 are higher
Nickel	B-5 is higher
Nitrate-N	B-2 is higher
Potassium, total	B-2 is higher
Total dissolved solids	B-4 is higher
Vinyl Chloride	B-5 is higher

6.5. Mann-Kendall Trend Test

The presence of significant increasing or decreasing trends was determined using the Mann-Kendall test. The Mann-Kendall test evaluates possible trends by comparing random pairs of data within the data set. The test statistic will increase if the later value is greater than the earlier value, and decrease if the later value is less than the earlier value. After the test statistic is determined, the Z-score is calculated from the test statistic. The farther the Z-score is from zero, the more significant the trend (EPA 2009).

A Mann-Kendall test was run on each well in every long-term and short-term time-series plot. The Mann-Kendall results show the slope of the trend, the Z-score, the critical threshold of significance for the Z-score, and if the Z-score is significant at the 98% confidence interval. Each analyte concentration is tested. Mann-Kendall long-term trend test results for the perched and upper regional aquifers are included in Appendix D-4 and E-4. Mann-Kendall short-term trend test results for the perched and upper regional aquifers are included in Appendix D-5 and E-5. A positive slope indicates an increasing trend, and a negative slope indicates a decreasing trend. Some results state the presence of a statistically significant increasing or decreasing trend in the data, but there were either no or very few actual detections within the data set. These trends are not considered statistically significant since they are the result of a change in laboratory detection limit of the analyte, and not an actual change in detected concentrations.

6.5.1. Perched Aquifer

Overall, the Mann-Kendall results indicate that every well shows improvement in water quality (Table 7). Most of the statistically significant decreasing trends have been found in the long-term data set. Only pH has shown a significant increasing trend in the long-term data set in Wells B-6, B-9, and B-11.

Table 7. Mann-Kendall Significant Trends: Perched Aquifer

Well	Analytes with Decreasing trends		Analytes with Increasing trends
B-6	**Ammonia-N** Antimony, dissolved Arsenic, dissolved Cadmium, dissolved Calcium, total Chemical oxygen demand Chromium, dissolved Copper, dissolved Iron, dissolved **Manganese, dissolved** **Selenium, dissolved** Sodium, total Specific conductance Sulfate Total organic carbon (TOC) Vanadium, dissolved Zinc, dissolved		pH
B-8	1,1-dichloroethane Arsenic, dissolved Calcium, total Chloride Chlorodifluoromethane (Freon 22) **Chromium, dissolved** Copper, dissolved Diethyl ether **Selenium, dissolved** Sodium, total Specific conductance Sulfate Vanadium, dissolved Zinc, dissolved		
B-9	1,1-dichloroethane Arsenic, dissolved Calcium, total **Chloride** Chromium, dissolved Copper, dissolved Dichlorofluoromethane (CFC-12) Magnesium, total Manganese, dissolved Potassium	**Selenium, dissolved** **Sodium, total** Specific conductance Sulfate Total dissolved solids TOC Vanadium, dissolved Vinyl chloride Zinc, dissolved	pH

Regular text denotes a long-term trend only
Bold text denotes both a long-term and short-term trend
Italicized text denotes a short-term trend only

Table 7. Mann-Kendall Significant Trends: Perched Aquifer (cont.)

Well	Analytes with Decreasing trends	Analytes with Increasing trends
B-11	*Ammonia-N* Arsenic, dissolved **Calcium, total** COD **Chloride** Chromium, dissolved Copper, dissolved Iron, dissolved Manganese, dissolved Selenium, dissolved **Sodium, total** Specific conductance **Sulfate** TOC Vanadium, dissolved Zinc, dissolved	pH
B-13	1,1-dichloroethane 1,2- dichloroethane Arsenic, dissolved Calcium, total Chlorodifluoromethane (Freon 22) cis-1,2-dichloroethene Diethyl ether Iron, dissolved Manganese, dissolved Sodium, total Specific conductance TOC Trichloroethene Vinyl chloride Zinc, dissolved	

Regular text denotes a long-term trend only
Bold text denotes both a long-term and short-term trend
Italicized text denotes a short-term trend only

6.5.2. Upper Regional Aquifer

Statistically significant long-term and short-term trends discerned from the upper regional aquifer data indicate that Wells B-2 and B-3 show the most long-term decreasing concentration trends for landfill analytes during the long-term monitoring period (Table 8). Wells B-1, B-4, B-5, B-10, and B-12 show the most increasing concentration trends, in both the long-term and short-term data sets. These increasing trends are all inorganic analytes, except for Freon-22 in Wells B-1 and B-4.

Table 8. Mann-Kendall Significant Trends: Upper Regional Aquifer

Well	Analytes with Decreasing trends		Analytes with Increasing trends	
B-1	Chromium, dissolved **Copper, dissolved** Selenium, dissolved *Sulfate* **Zinc, dissolved**		**Alkalinity** **Ammonia-N** **Barium, dissolved** **Bicarbonate** Calcium, total Chloride Freon 22 Iron, dissolved Magnesium, total	**Manganese, dissolved** Nickel, dissolved Potassium, total Specific conductance Sodium, total **Sulfate** TDS TOC
B-2	1,1-dichloroethane *Ammonia-N* Arsenic, dissolved Calcium, total **Chloride** Chromium, dissolved **Copper, dissolved** CFC-12 Iron, dissolved Magnesium, total **Manganese, dissolved** Nickel, dissolved	*Nitrate-N* Selenium, dissolved **Sodium, total** Specific conductance Sulfate TDS TOC Vanadium, dissolved Vinyl chloride **Zinc, dissolved**	Potassium	
B-3	Calcium, total Chloride Chromium, dissolved Copper, dissolved Diethyl ether Iron, dissolved Manganese, dissolved	*Selenium, dissolved* Sodium, total Specific conductance TOC Vanadium, dissolved Vinyl chloride Zinc, dissolved	pH	
B-4	**Alkalinity** *Ammonia-N* Arsenic, dissolved *Barium, dissolved* **Bicarbonate** *Calcium, total* *Chloride* **Chromium, dissolved** *Freon 22*	*Manganese, dissolved* *Sodium, total* Specific conductance Vanadium, dissolved **Vinyl chloride** Zinc, dissolved	Ammonia-N Calcium, total Chloride COD Freon 22 Iron, dissolved	Sodium, total Sulfate TOC
B-5	*Arsenic, dissolved* Freon 22 Chromium, dissolved *Copper, dissolved* CFC-12 Freon 21	Manganese, dissolved Selenium, dissolved Specific conductance Vanadium, dissolved Vinyl chloride Zinc, dissolved	Calcium, total Chloride COD	**Potassium, total** **Sodium, total** Tetrahydrofuran TDS

Regular text denotes a long-term trend only
Bold text denotes both a long-term and short-term trend
Italicized text denotes a short-term trend only

Table 8. Mann-Kendall Significant Trends: Upper Regional Aquifer (cont).

Well	Analytes with Decreasing trends	Analytes with Increasing trends	
B-10	Arsenic, dissolved Chromium, dissolved **Copper, dissolved** Vanadium, dissolved Zinc, dissolved	**Ammonia-N** Calcium, total Chloride Iron, dissolved	Manganese, dissolved Potassium Sodium, total Specific conductance Sulfate TOC
B-12	Arsenic, dissolved *Chloride* **Copper, dissolved** Manganese, dissolved Specific conductance TOC Zinc, dissolved	**Alkalinity** **Barium, dissolved** **Bicarbonate** Calcium, total *Chloride* Iron, dissolved **Magnesium, total**	Potassium, total *Specific conductance* Sodium, total Sulfate **TDS**

Regular text denotes a long-term trend only
Bold text denotes both a long-term and short-term trend
Italicized text denotes a short-term trend only

7.0 LANDFILL GAS EXTRACTION AND MONITORING ACTIVITIES

To alleviate the accumulation of methane beneath the landfill cap and to control off-site methane migration, Inman Landfill has a LFG extraction system consisting of 27 wells and trenches (Figure 8). The landfill also contains perimeter LFG monitoring probes to monitor for off-site migration of LFG.

7.1. LFG Extraction System Operation

The LFG system was operated sporadically during 2018 due to low methane levels within the landfill and over-capacity of the current equipment configuration.

7.2. Perimeter Monitoring

Section (2)(b)(i) of Chapter 173-304-460 WAC specifies minimum functional air quality standards for landfills. These standards limit the concentration of explosive gases at the property boundary to the lower explosive limit (LEL) for that gas. For methane, the LEL occurs at a concentration of approximately 5 percent by volume. To monitor for potential exceedance of this standard, concentrations of methane and associated landfill gases (oxygen and carbon dioxide) are measured in 10 nested perimeter LFG monitoring probe sets that include a total of 24 individual probes. Measurements of LFG concentrations in perimeter monitoring probes were conducted during the 1st, 2nd, 3rd, and 4th quarterly monitoring events in 2018. The results of these measurements are presented in Table G-1 located in Appendix G.

The LFG probes are located on all sides of the landfill perimeter as depicted in Figure 9. Some of the probes are co-located with groundwater monitoring wells (Wells B-6, B-7, B-9, B-11, and B-13) and some are stand-alone probes (Probes GDW-1, GDW-2, GDW-3, GDW-5, GP-6, and GP-7). The depths of the screened intervals of the probes vary from 7 to 87 feet below ground surface (Table F-1). For assessment purposes, methane concentrations measured in each probe were compared to the methane air quality standard of 5 percent methane by volume. The maximum concentrations of methane detected at each LFG monitoring probe set during each measuring event in 2018 are depicted in Figures 9a through 9d.

Comparisons of the methane results to the air quality standard shows that there were only detections of methane exceeding the LEL at GDW-1 in 2018. Historically, methane has been detected in GDW-1 and B-13 at concentrations above the LEL. Probe set GDW-1 is located near the southeastern corner of the Inman Landfill site. The properties adjacent to the east and south of the landfill are vacant. Currently, subsurface methane concentrations in this area do not appear to present an immediate risk to the public.

In general, concentrations detected in 2018 show an increase at GDW-1 from the concentrations measured in 2017. In 2014, two methane concentrations were above the LEL, and in 2015, three methane concentrations were above the LEL. The highest methane concentration measured in 2018 was 27% in the shallow probe of GDW-1 during the fourth quarter monitoring event.

8.0 INSPECTIONS

Inspections were conducted in conjunction with quarterly groundwater monitoring in 2018.

9.0 SUMMARY AND CONCLUSIONS

Inman Landfill closed in 1994. Post-closure activities have been on-going since closure was completed in 1995. These activities include: leachate collection and disposal, LFG collection, perimeter groundwater monitoring, subsurface LFG monitoring, surface water monitoring, and site maintenance. Groundwater monitoring activities include collection of groundwater samples from two aquifers: an unconfined perched aquifer and a confined upper regional aquifer. Monitoring data indicate that groundwater in the perched aquifer generally flows to the west and southwest and the upper regional aquifer flows in a radial pattern toward the north, northeast, and east.

Assessment of groundwater monitoring results shows that several groundwater quality standards were exceeded at one or more monitoring wells in both aquifers during 2018. Standards exceeded include the WAC 173-200 carcinogen standards for dissolved arsenic and vinyl chloride, and the WAC 173-200 secondary standards for dissolved iron, dissolved manganese, and total dissolved solids.

Only two of the original six perched aquifer wells had sufficient water to collect groundwater samples in 2018. These include B-6 and B-9. The two perched aquifer monitoring wells sampled during 2018 contained elevated concentrations of landfill-related analytes, specifically dissolved arsenic, relative to state standards, which could indicate impact from the landfill. Every well has shown improved water quality in recent years compared to that observed in 1994, particularly with regards to VOCs. No inorganic analytes are showing increasing trends. No VOCs show any increasing trends. Out of all of the perched aquifer wells, 17 inorganic analytes show decreasing trends, although dissolved arsenic, iron, and manganese are still exceeding regulatory limits at B-8. B-8 has not been sampled since June of 2017.

All wells screened in the upper regional aquifer sampled during 2018 contained elevated concentrations of landfill-related analytes relative to state standards, which could indicate impact from the landfill with the degree of apparent impact varying from well to well. Exceedance of standards for metals also tended to be widespread, while exceedance of standards for VOCs also tended to be more localized, occurring in only three wells (B-3, B-4, and B-5). Approximately 16 inorganic analytes show increasing trends. Four of these inorganic analytes (dissolved iron, dissolved manganese, pH, and TDS) exceed regulatory limits. Significant VOC concentrations were limited to wells B-3 and B-5. One VOC, Chlorodifluoromethane (Freon 22), shows an increasing trend, however this VOCs doesn't have regulatory limits. Twenty-five inorganics and 5 VOCs are exhibiting decreasing trends with only one of these VOCs (vinyl chloride) currently exceeding regulatory limits. VOCs were not detected above laboratory PQLs in Wells B-1, B-10, or B-12 during 2018. This VOC distribution is consistent with the regional groundwater flow characteristics for this aquifer.

Although apparent impacts from the landfill continue within both aquifers, most of the time-series plots and Mann-Kendall trend tests for the last 23 years show decreasing concentration trends in most wells, indicating that groundwater in the vicinity of the landfill is continuing to improve. Decreasing trends were most apparent in wells completed within the perched aquifer, which historically has shown the highest degree of impact. However, there are some increasing trends in the regional aquifer which could indicate continued impact to the groundwater quality below the landfill. Improvements to groundwater quality underlying the site appear to be directly attributable to several specific corrective actions conducted at suspected groundwater contaminant sources during general closure activities conducted in 1994 and 1995. These corrective actions included:

- Recapping the old, unlined (Phase I) portion of the landfill which reduced the amount of precipitation infiltrating the landfill, and consequently the amount of leachate entering groundwater.

- Eliminating leachate seeps that allowed leachate to enter into the drainage system.

- Improving the old infiltration basin and constructing a new infiltration basin.

- Relining the pre-treatment leachate pond and pump station.

- Constructing and operating an active LFG extraction system that reduced the potential for VOCs to enter groundwater via partitioning.

- Making other drainage improvements which eliminated surface water run-on to the site and consequently reduced the amount of leachate generated.

In addition to these corrective actions, Skagit County has connected several homes located southwest and southeast of the landfill to a public water system and subsequently abandoned their drinking water wells. Because of their location and well construction characteristics, these wells had the potential to be impacted by contaminants from the landfill. These connections have removed the threat of impacts to nearby drinking water sources.

The results of perimeter gas monitoring activities indicate that the historical operation of the LFG system has been effective at controlling landfill gas migration in the vicinity of Probes GDW-1 and B-13.

10.0 RECOMMENDATIONS

As a result of closure activities and the implementation of corrective actions, groundwater quality at the site has shown signs of significant improvement and is expected to further improve with time. Furthermore, the risk of potential impacts to domestic wells located southeast and southwest of the landfill has been eliminated due to their abandonment and the connection of the homes to a public water source. The increasing trends of inorganic analytes in the upper regional aquifer will continue to be monitored.

Perimeter gas monitoring results indicate that the historical operation of the LFG system is effective at control methane concentrations in the vicinity of GDW-1. Monthly operation of the LFG system will continue during 2019.

11.0 REFERENCES

Environmental Protection Agency. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. EPA 530-R-09-007. March 2009.

Skagit County Public Works Department. 2010. Quality Assurance Project Plan. Appendix B of Post-Closure Operations and Maintenance Manual, Inman Landfill. February 2010.

Sweet, Edwards, and Associates, Inc. 1987. Inman Landfill Hydrogeology Investigation Phase II Report. January 16, 1987.

FIGURES

Figure 1. **Inman Landfill Location Map**

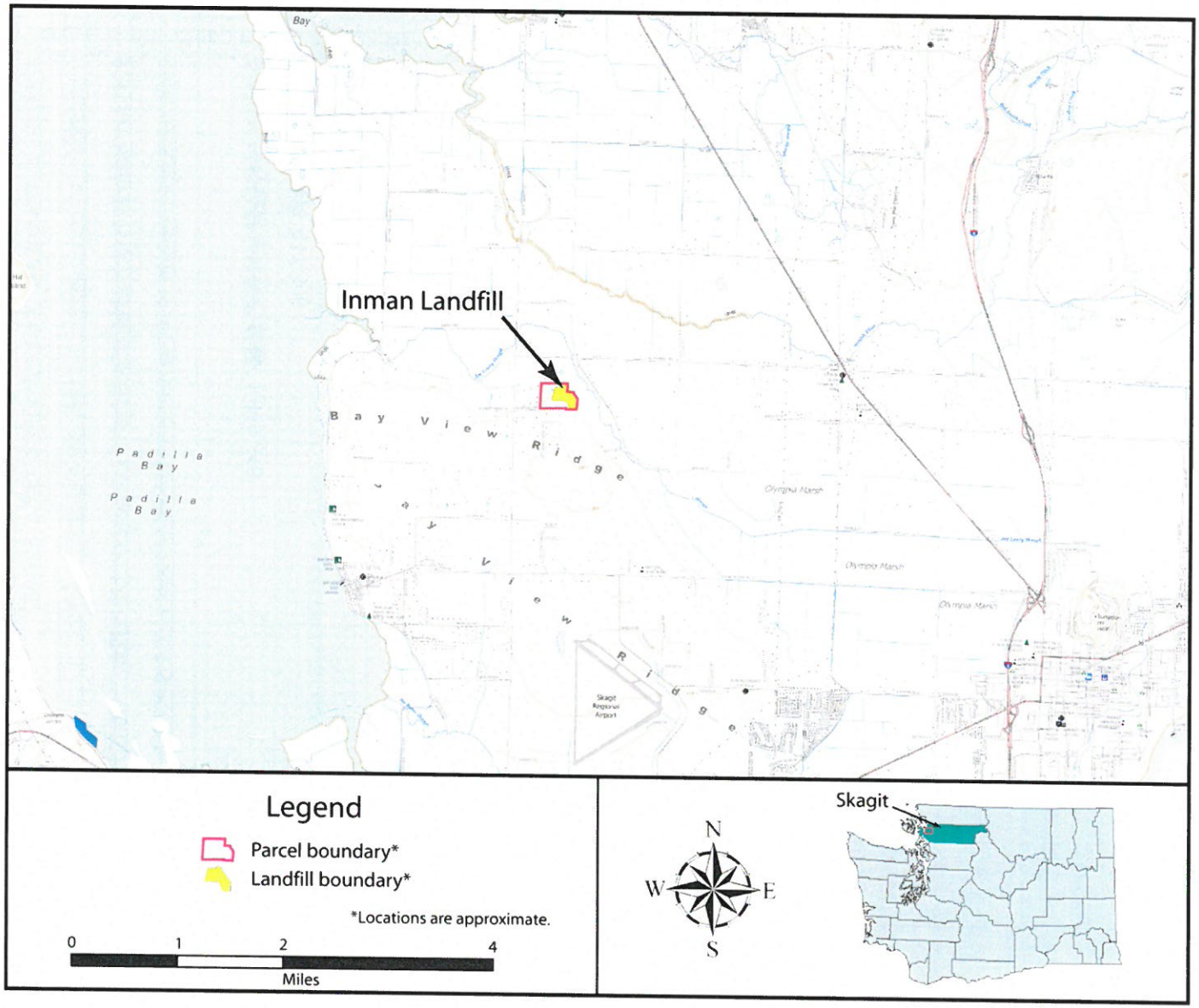


Figure 2. **Annual Volume of Leachate Disposed.**

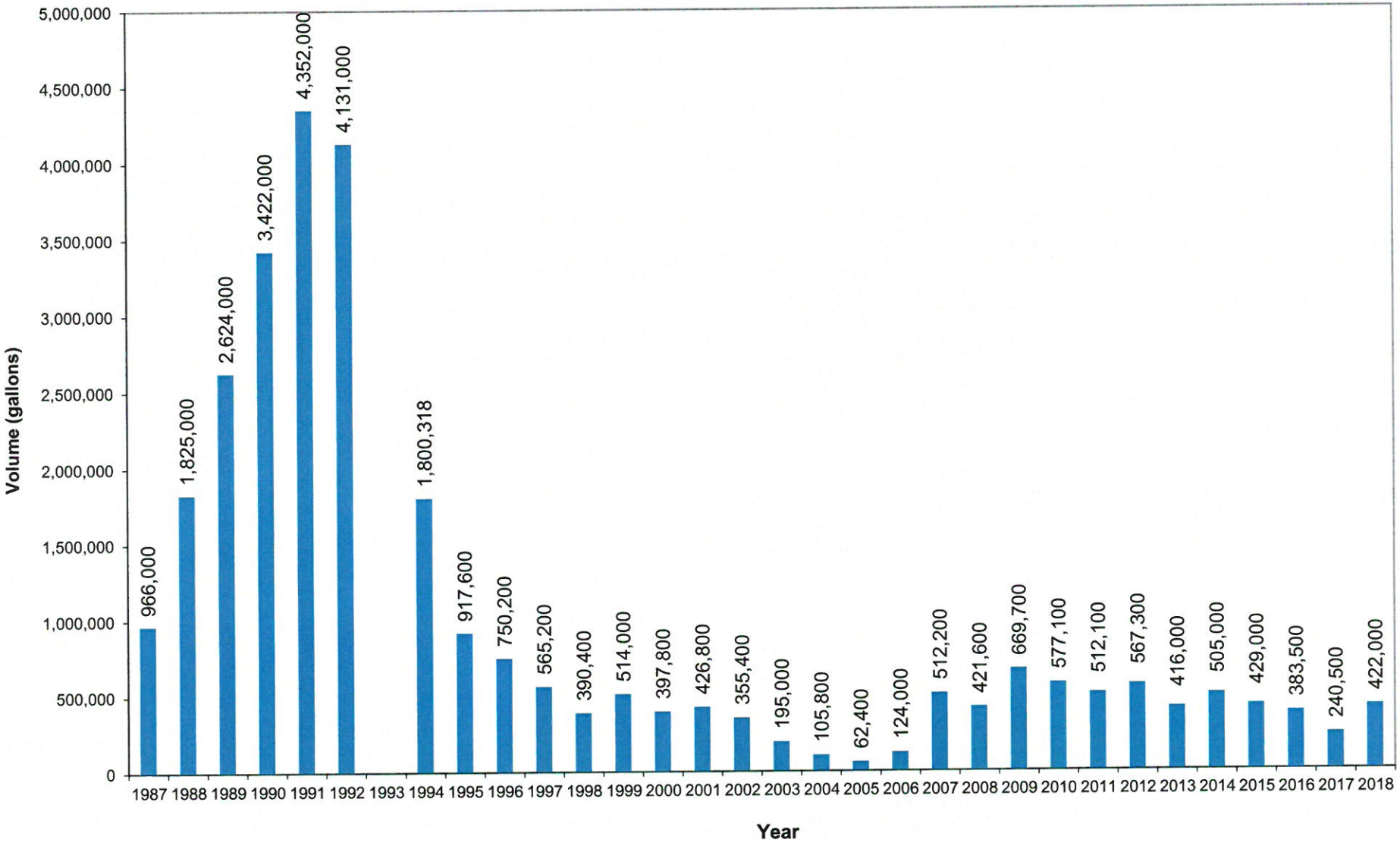


Figure 3. **Perched Aquifer Monitoring Well Locations.**

Figure 3a. Potentiometric Surface Contour Map, Perched Aquifer, March 2018.

LEGEND

B-6	Monitoring Well
—12.5—	Potentiometric Surface Contour (feet above MSL)
	Direction of Groundwater Flow
(9.03)	Measured Static Water-Level Elevation (feet above MSL)
- - -	Approximate Landfill Boundary

Figure 3b. Potentiometric Surface Contour Map Perched Aquifer, June 2018.

LEGEND

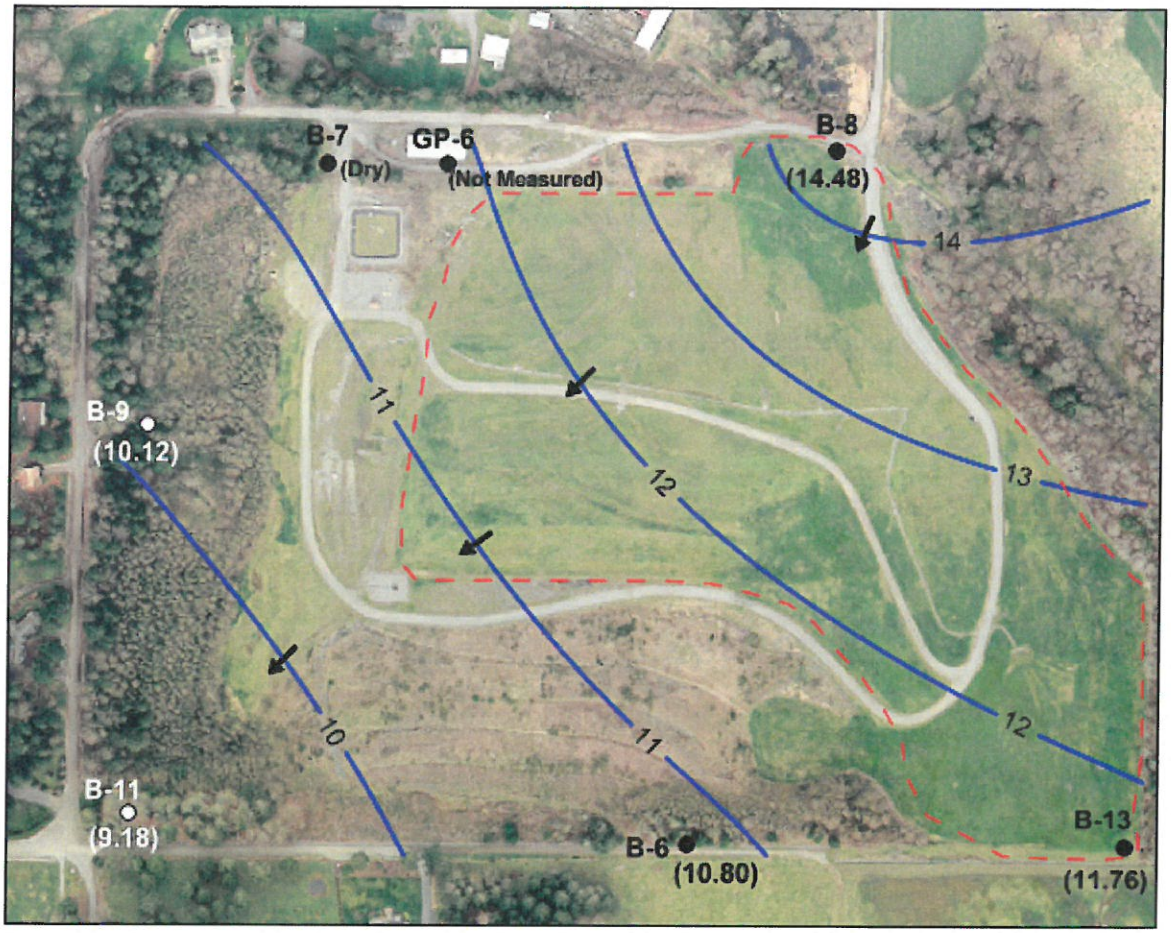
B-6 ●	Monitoring Well
—12.5—	Potentiometric Surface Contour (feet above MSL)
	Direction of Groundwater Flow
(9.03)	Measured Static Water-Level Elevation (feet above MSL)
– – –	Approximate Landfill Boundary

Figure 3c. Potentiometric Surface Contour Map, Perched Aquifer, September 2018.

LEGEND

B-6 ●	Monitoring Well
—12.5—	Potentiometric Surface Contour (feet above MSL)
	Direction of Groundwater Flow
(9.03)	Measured Static Water-Level Elevation (feet above MSL)
- - -	Approximate Landfill Boundary

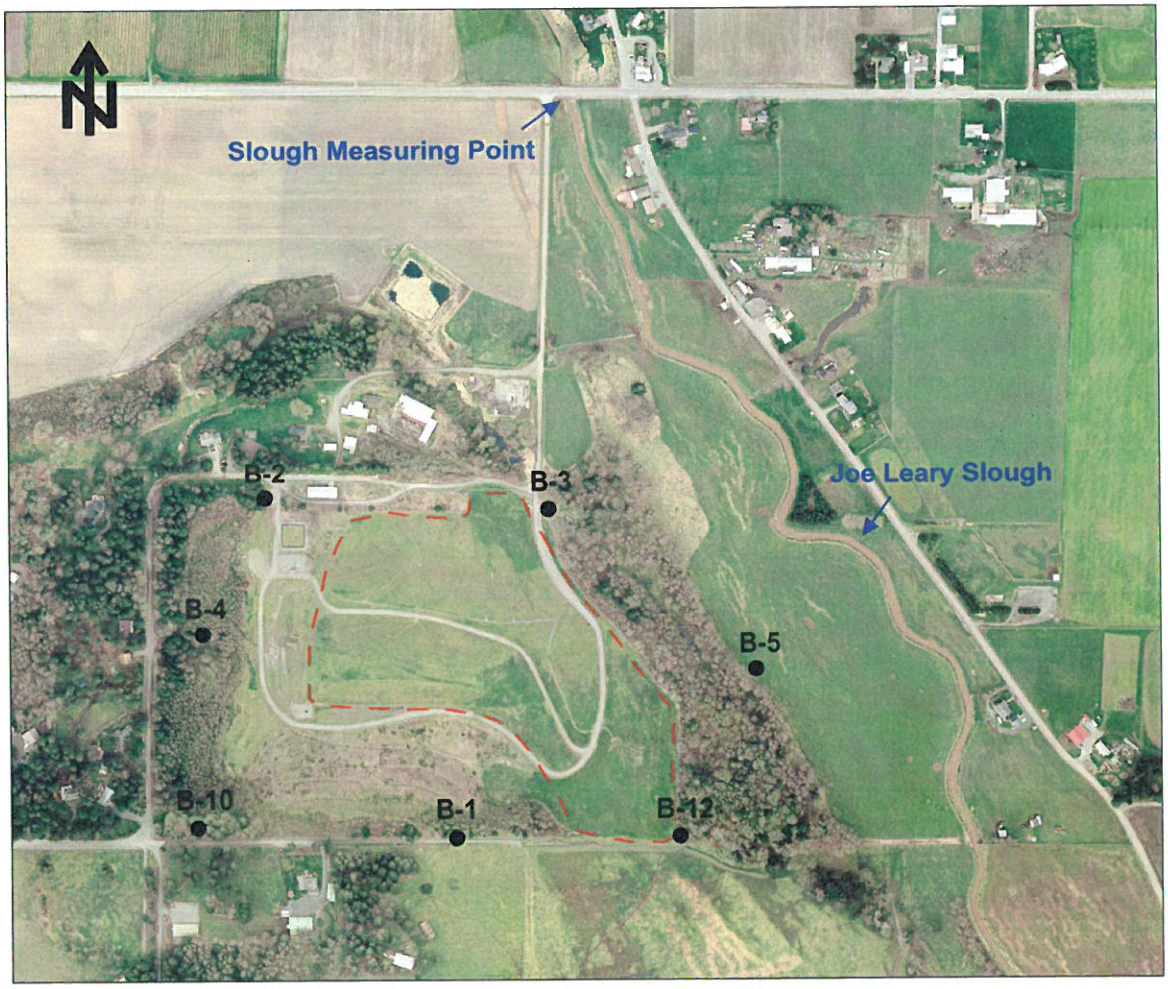
Figure 3d **Potentiometric Surface Contour Map, Perched Aquifer, December 2018.**



LEGEND

B-6 ●	Monitoring Well
—12.5—	Potentiometric Surface Contour (feet above MSL)
	Direction of Groundwater Flow
(9.03)	Measured Static Water-Level Elevation (feet above MSL)
– – –	Approximate Landfill Boundary

Figure 4. **Regional Aquifer Monitoring Well Locations.**



LEGEND

B-10 ● Monitoring Well

– – – Approximate Landfill Boundary

Figure 4a. Potentiometric Surface Contour, Central Landfill, Regional Aquifer, March 2018.

LEGEND

B-6 Monitoring Well

—8.2— Potentiometric Surface Contour (feet above MSL)

Direction of Groundwater Flow

(8.43) Measured Static Water-Level Elevation (feet above MSL)

Approximate Landfill Boundary

Figure 4b. Potentiometric Surface Contour, Central Landfill, Regional Aquifer, June 2018.

LEGEND

B-6 ●	Monitoring Well
—8.2—	Potentiometric Surface Contour (feet above MSL)
→	Direction of Groundwater Flow
(8.43)	Measured Static Water-Level Elevation (feet above MSL)
- - -	Approximate Landfill Boundary

Figure 4c. **Potentiometric Surface Contour, Central Landfill, Regional Aquifer, September 2018.**

LEGEND

B-6 Monitoring Well

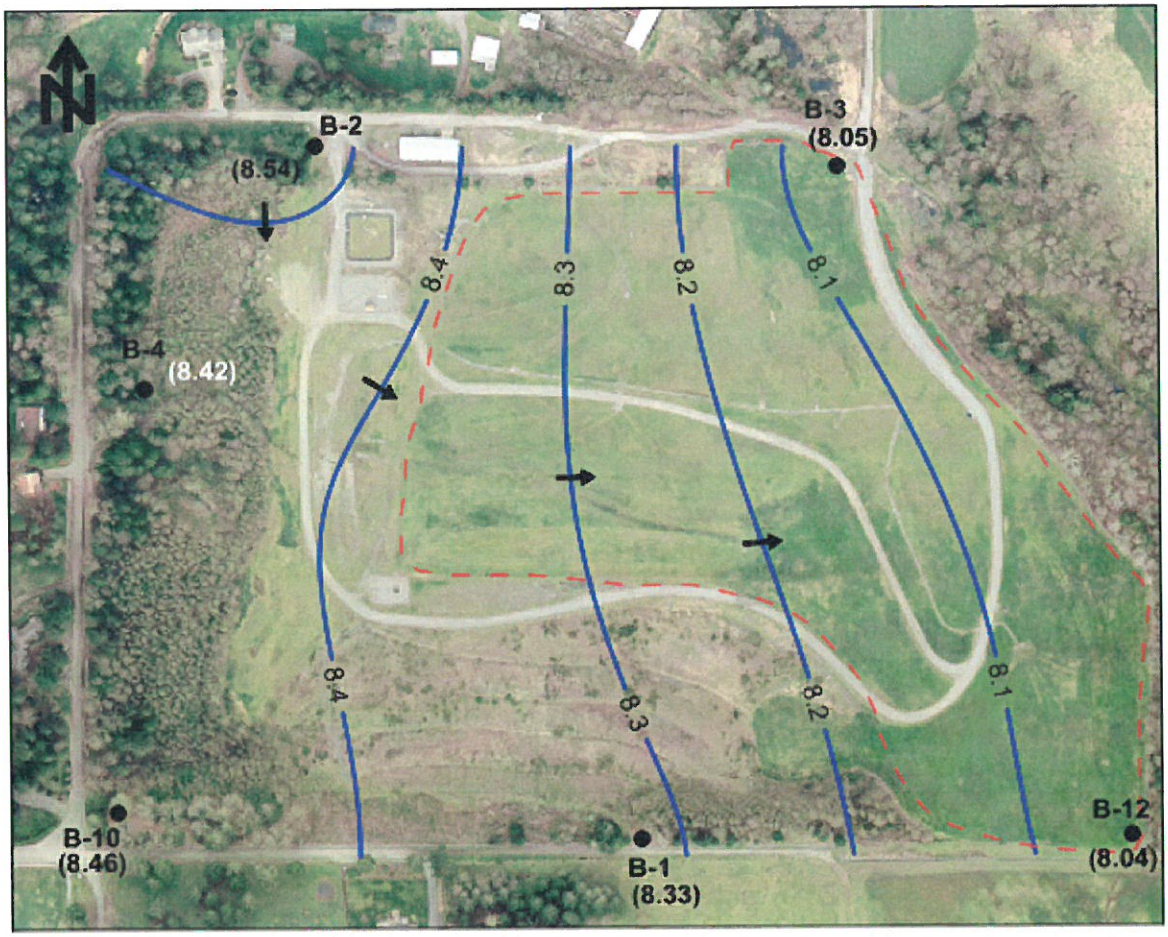
—8.2— Potentiometric Surface Contour (feet above MSL)

Direction of Groundwater Flow

(8.43) Measured Static Water-Level Elevation (feet above MSL)

Approximate Landfill Boundary

Figure 4d. **Potentiometric Surface Contour, Central Landfill, Regional Aquifer, December 2018**



LEGEND

B-6 Monitoring Well

—8.2— Potentiometric Surface Contour (feet above MSL)

Direction of Groundwater Flow

(8.43) Measured Static Water-Level Elevation (feet above MSL)

Approximate Landfill Boundary

Figure 5. **Perched Aquifer Hydrograph, 1994-2018**

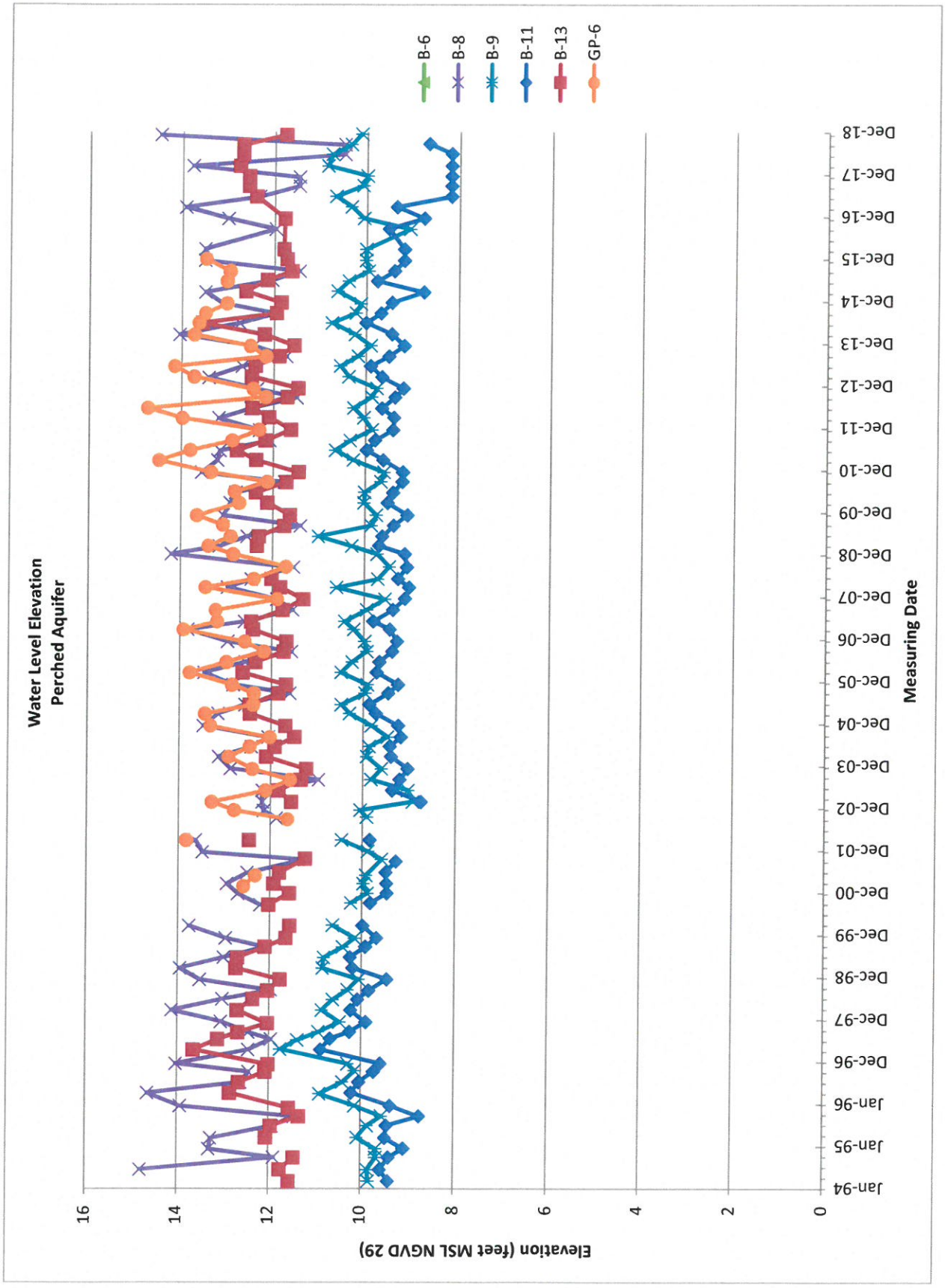


Figure 6. **Regional Aquifer Hydrograph, 1994-2018**

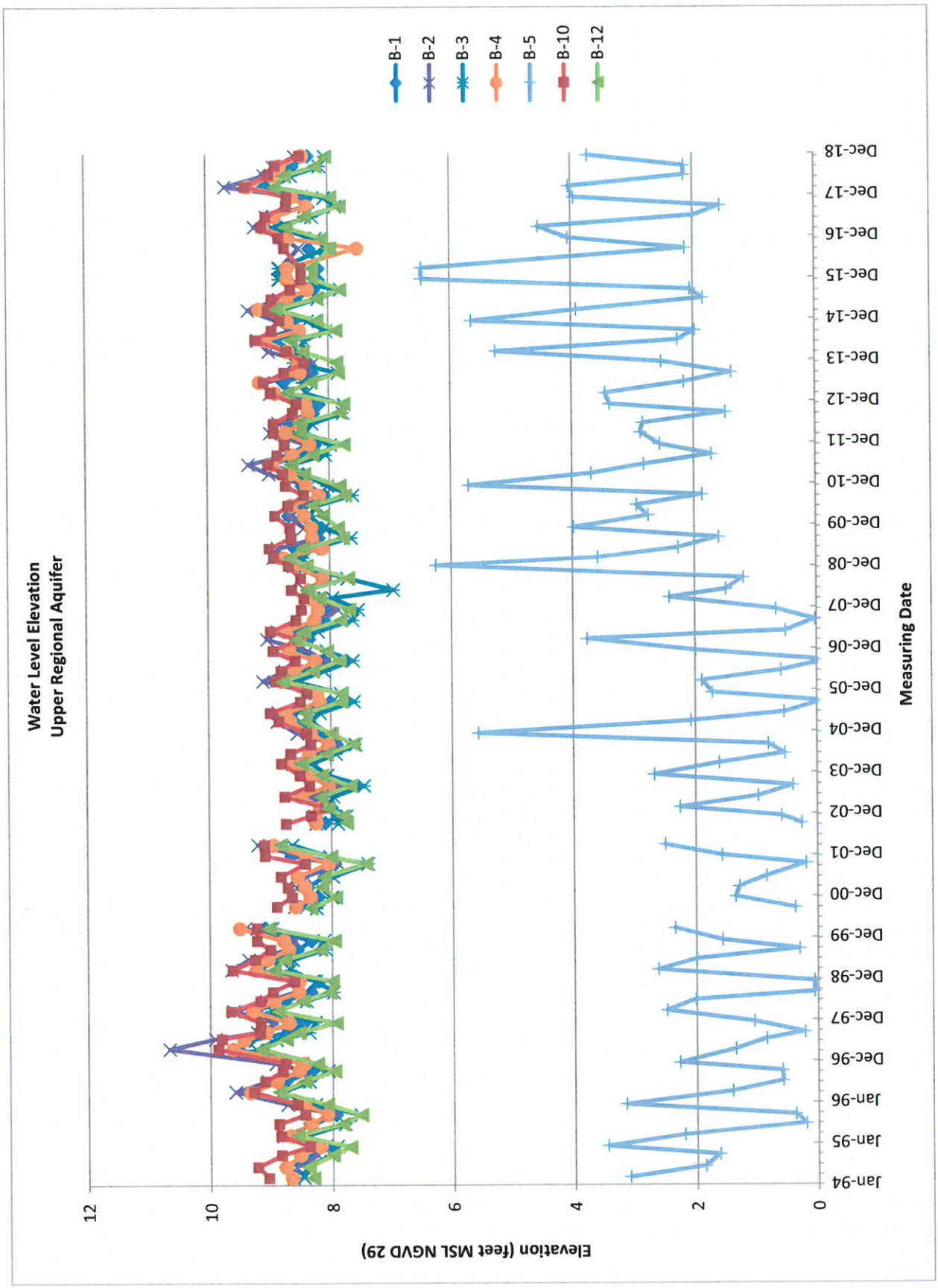
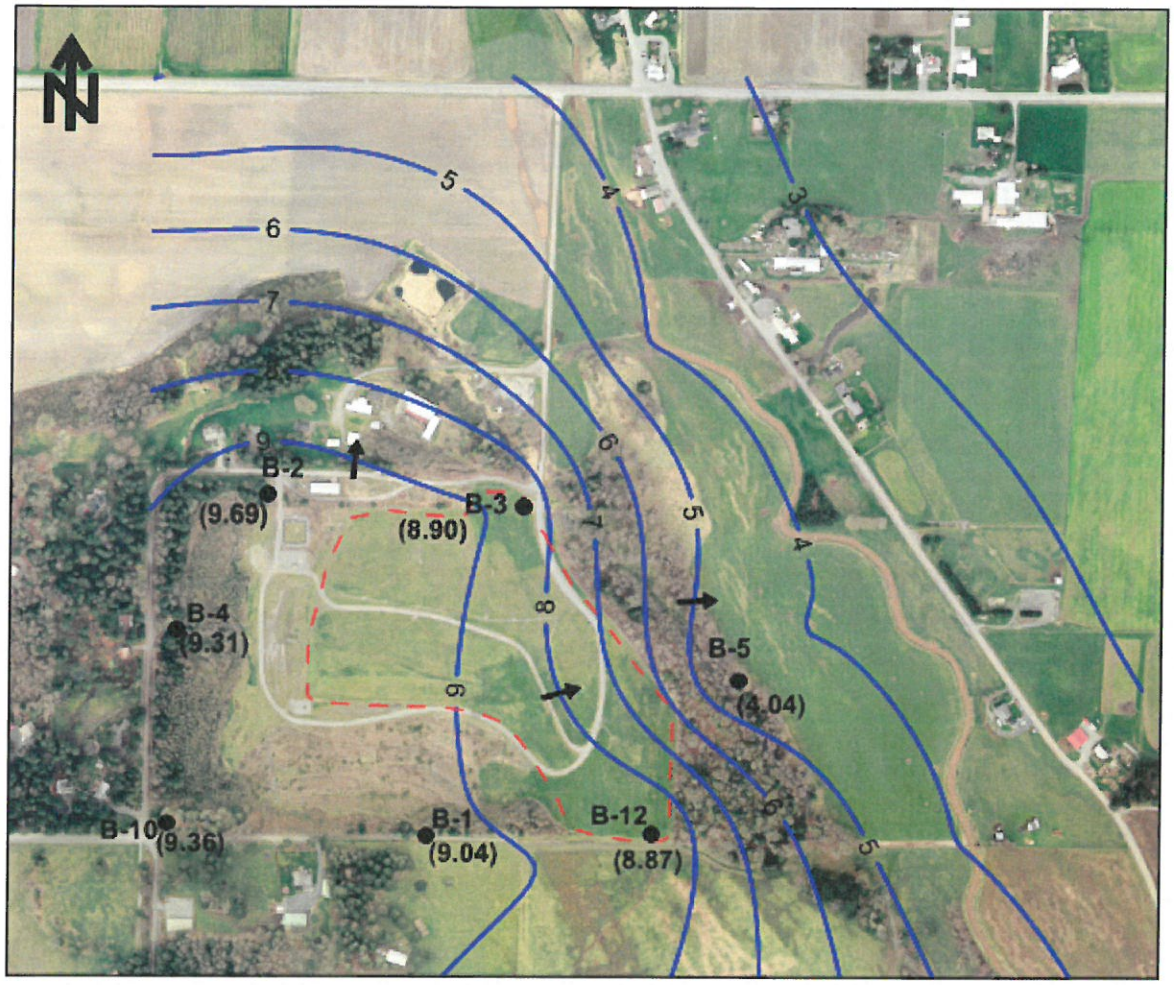


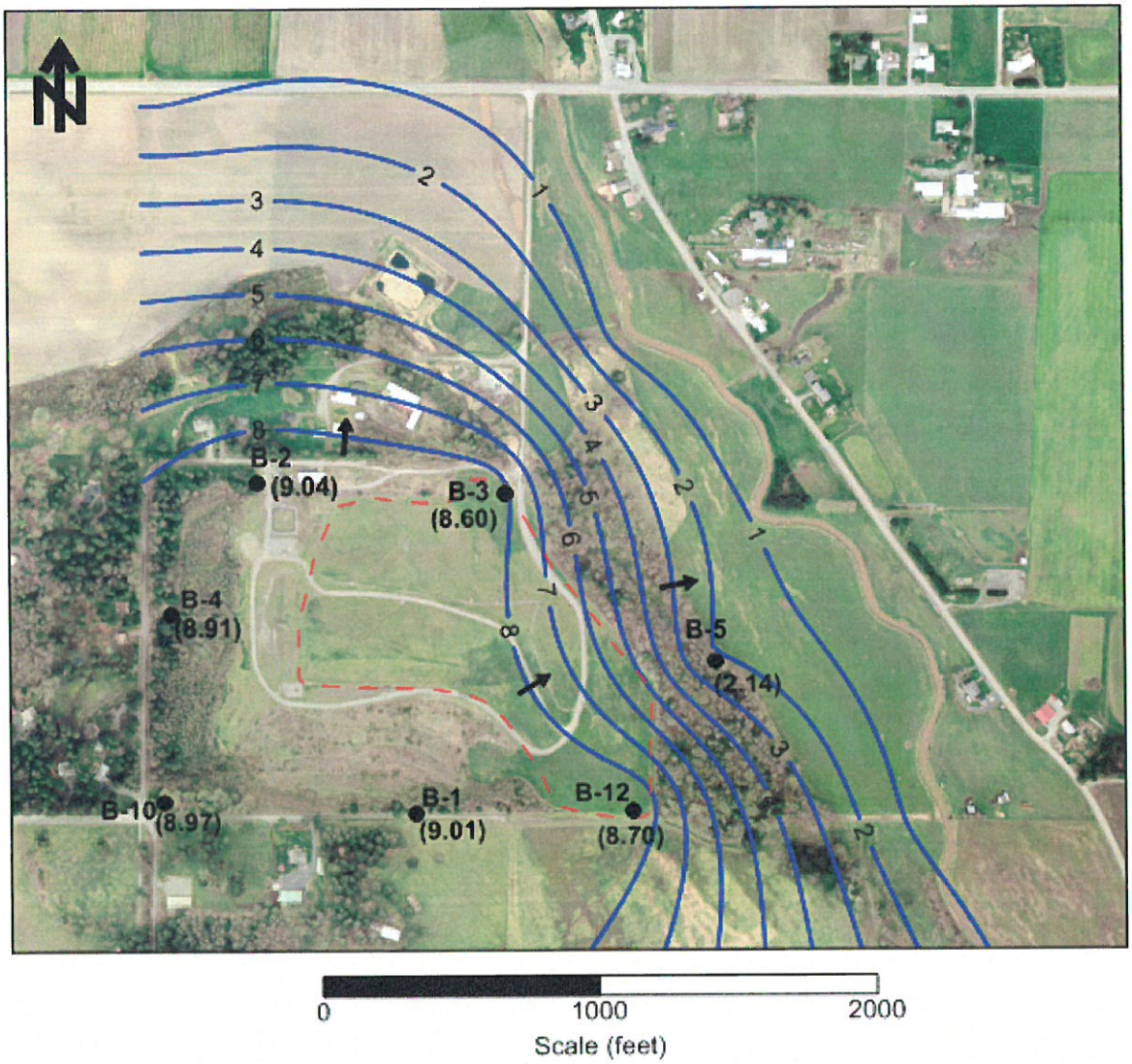
Figure 7a **Potentiometric Surface Contour Map, Regional Aquifer, March 2018**



LEGEND

B-10 ●	Monitoring Well
— 8 —	Potentiometric Surface Contour (feet above MSL)
(8.18)	Measured Static Water-Level Elevation (feet above MSL)
→	Direction of Groundwater Flow
- - -	Approximate Landfill Boundary

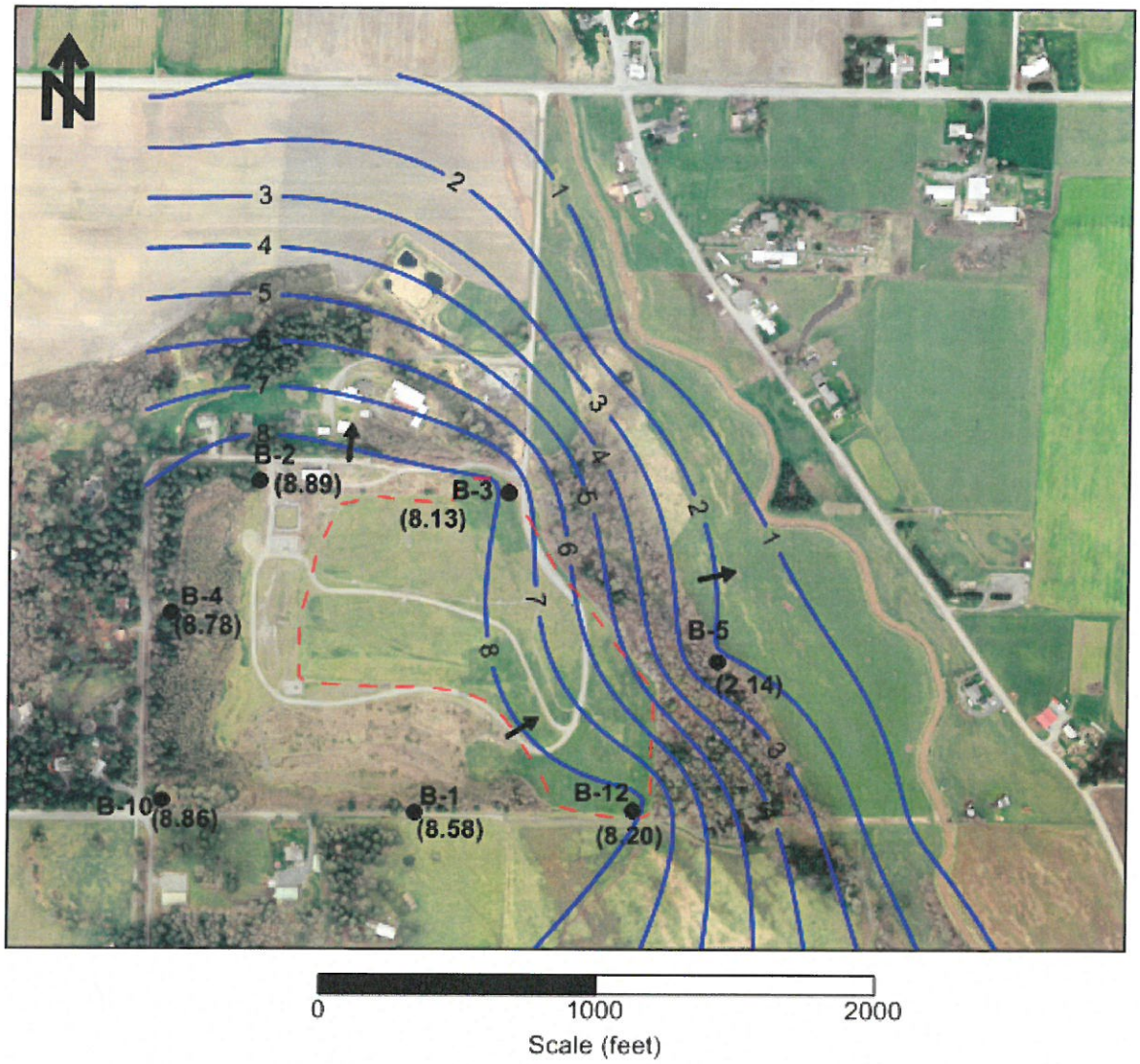
Figure 7b. Potentiometric Surface Contour Map, Regional Aquifer, June 2018.



LEGEND

- B-10 ● Monitoring Well
- — 8 — Potentiometric Surface Contour (feet above MSL)
- (8.18) Measured Static Water-Level Elevation (feet above MSL)
- → Direction of Groundwater Flow
- - - - Approximate Landfill Boundary

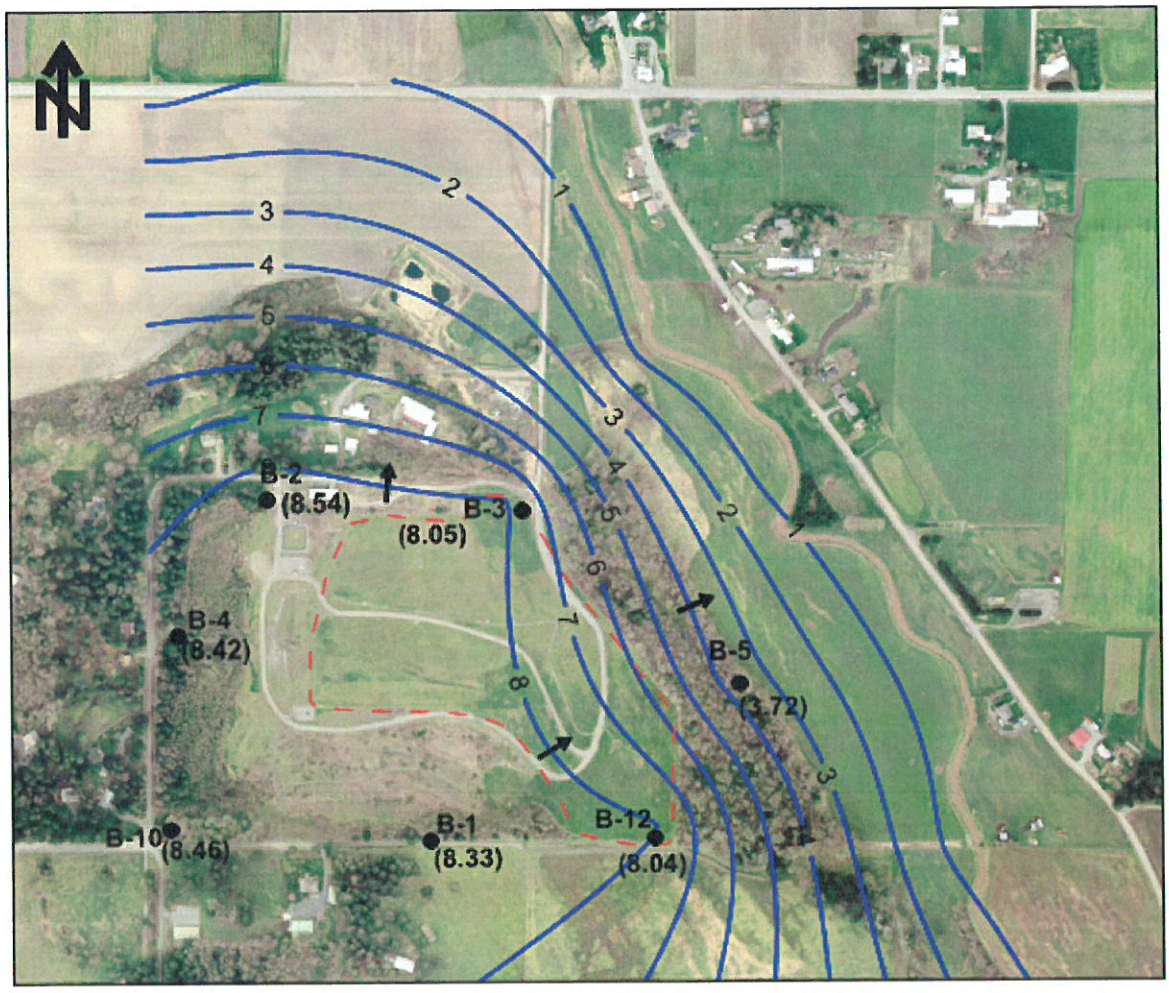
Figure 7c. Potentiometric Surface Contour Map, Regional Aquifer, September 2018.



LEGEND

B-10 ●	Monitoring Well
— 8 —	Potentiometric Surface Contour (feet above MSL)
(8.18)	Measured Static Water-Level Elevation (feet above MSL)
→	Direction of Groundwater Flow
- - -	Approximate Landfill Boundary

Figure 7d **Potentiometric Surface Contour Map, Regional Aquifer, December 2018**



LEGEND

B-10 ● Monitoring Well

— 8 — Potentiometric Surface Contour (feet above MSL)

(8.18) Measured Static Water-Level Elevation (feet above MSL)

→ Direction of Groundwater Flow

- - - Approximate Landfill Boundary

Figure 8. **Inman Landfill Gas Extraction System Layout**

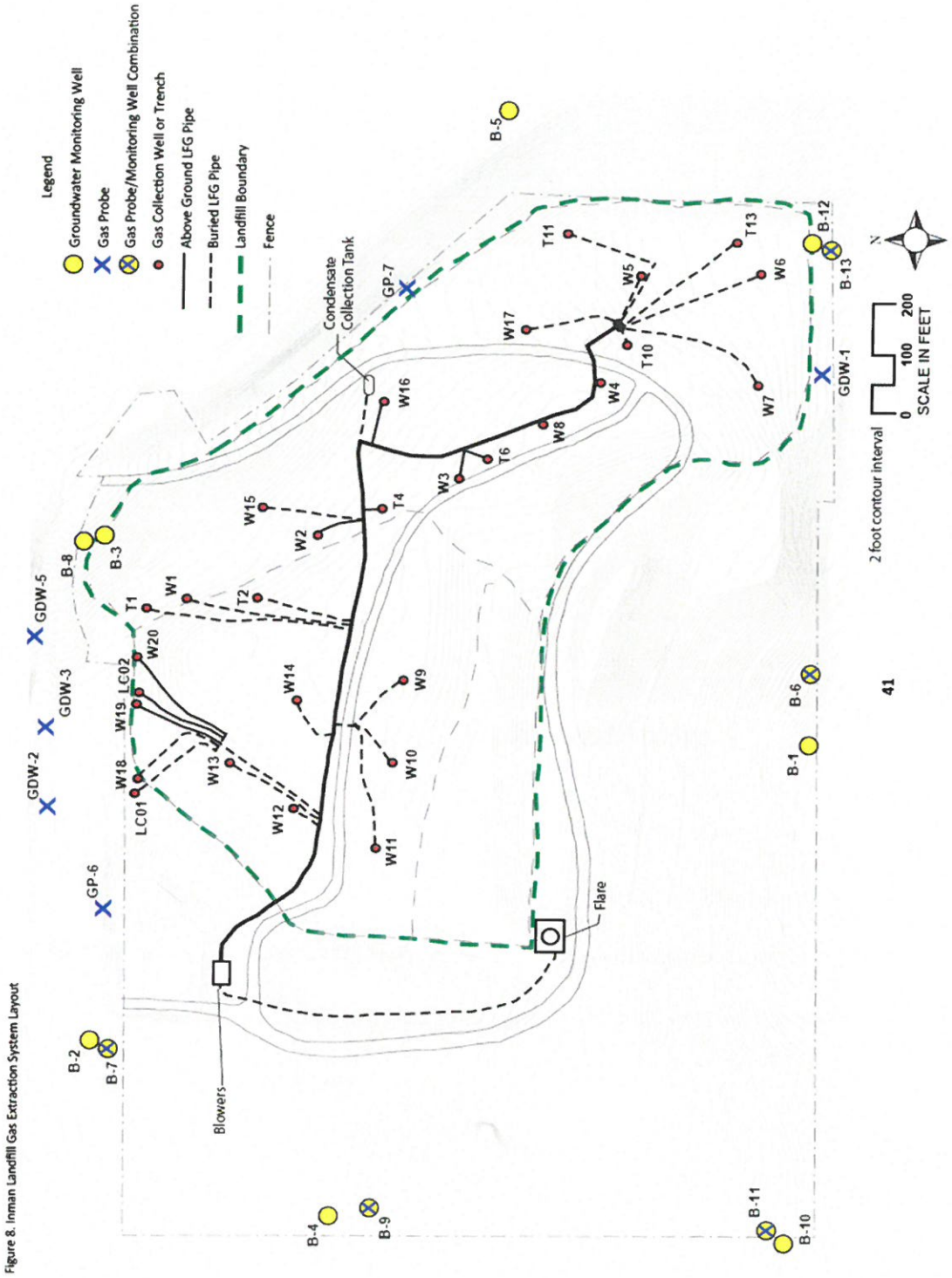


Figure 8. Inman Landfill Gas Extraction System Layout

Figure 9. **Landfill Gas Perimeter Monitoring Probe Locations.**

LEGEND

B-6 Perimeter Gas Monitoring Well

(6.9%) Maximum methane concentration (<=0.1% for wells with no concentrations shown)

– – – Approximate Landfill Boundary

Figure 9a. Landfill Gas Perimeter Monitoring Results, March 2018.

0 500 1000

Scale (feet)

LEGEND

B-6 Perimeter Gas Monitoring Well

(6.9%) Maximum methane concentration (<=0.1% for wells with no concentrations shown)

Approximate Landfill Boundary

Figure 9b. **Landfill Gas Perimeter Monitoring Results, June 2018.**

LEGEND

B-6 Perimeter Gas Monitoring Well

(6.9%) Maximum methane concentration (<=0.1% for wells with no concentrations shown)

Approximate Landfill Boundary

Figure 9c. Landfill Gas Perimeter Monitoring Results, September 2018.

LEGEND

B-6 ● Perimeter Gas Monitoring Well

(6.9%) Maximum methane concentration (<=0.1% for wells with no concentrations shown)

– – – Approximate Landfill Boundary

Figure 9d **Landfill Gas Perimeter Monitoring Results, December 2018**

LEGEND

B-6 Perimeter Gas Monitoring Well

(6.9%) Maximum methane concentration (<=0.1% for wells with no concentrations shown)

Approximate Landfill Boundary

APPENDIX A-1:
2018 Groundwater Monitoring Data – Perched Aquifer

2018 Inorganic Monitoring Results
Inman Landfill

AQUIFER			Perched			
MONITORING WELL Sampling Date			B-6 3/13/2018	B-6 6/20/2018	B-6 9/11/2018	B-6 12/10/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
CONVENTIONALS						
Chemical Oxygen Demand	mg/L		20	20 U	20 U	20 U
Total Organic Carbon	mg/L		5.63	2.03	1.76	1.74
Total Dissolved Solids †	mg/L	**500	274	307	268	228
Alkalinity †	mg/L		210	226.3	216.6	180.9
Bicarbonate †	mg CaCO3/L		213	226.3	216.6	180.9
Ammonia as nitrogen	mg/L		0.01 U	0.01 U	0.01	0.01 U
Nitrate as nitrogen	mg/L	*10	4.85	4.53	3.83	3.91
Nitrite as nitrogen	mg/L		0.1 U	0.1 U	0.1 U	0.1 U
Chloride	mg/L	**250	5.7	6.3	4.1	2.6
Sulfate	mg/L	**250	7.2	7.1	8.3	10.5
pH	SU	**6.5-8.5	7.21	7.1	7.4	7.16
Specific Conductance	µS/cm		397	526	457	400
Temperature	C		10.19	10.31	11.45	10.63
METALS						
Dissolved Antimony †	mg/L		0.0002 J	0.00026 J	0.0003 J	0.0004 J
Dissolved Arsenic	mg/L	***0.00005	**0.0007** J	**0.0007**	**0.0006** J	**0.0006** J
Dissolved Barium †	mg/L	*1.0	0.033	0.036	0.03	0.028
Dissolved Cadmium	mg/L	*0.01	0.0003 J	0.00025 U	6E-05 J	0.001 U
Dissolved Chromium †	mg/L	*0.05	0.0005 J	0.001	0.001	0.0006 J
Dissolved Cobalt †	mg/L		0.0001 J	0.001 U	6E-05 J	0.001 U
Dissolved Copper †	mg/L	**1.0	0.0017 J	0.0011 J	0.001 J	0.001 J
Dissolved Iron	mg/L	**0.3	0.05 U	0.05 U	0.05 U	0.05 U
Dissolved Lead	mg/L	*0.05	6E-05 J	0.0005 U	0.001 U	0.001 U
Dissolved Manganese	mg/L	**0.05	0.001	0.00016 J	0.0002 J	0.0005 J
Dissolved Mercury	mg/L	*0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dissolved Nickel †	mg/L		0.0009 J	0.0006 J	0.0004 J	0.0002 J
Dissolved Selenium †	mg/L	*0.01	0.0004 J	0.001 U	0.0006 J	0.0009 J
Dissolved Vanadium †	mg/L		0.001	0.002	0.002	0.0013
Dissolved Zinc	mg/L	**5.0	0.0043	0.0014 J	0.0009 J	0.002 U
Total Calcium	mg/L		63.9	54.5	56.1	52.7
Total Magnesium †	mg/L		26.1	24.2	2.85	19.7
Total Potassium †	mg/L		3.17	2.4	22.4	2.8
Total Sodium	mg/L		5.06	3.94	4.77	5.22

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen

Units:

mg/L = milligrams per liter
µg/L = micrograms per liter
SU = standard units
µS/cm = microsiemens per centimeter
C = degrees centigrade
mg CaCO3/L = milligrams of calcium carbonate per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.
NT — Not tested.

Results shown in bold exceed Ground Water Quality Criteria.
† Indicates supplement analytes measured due to Ecology request

2018 Inorganic Monitoring Results
Inman Landfill

AQUIFER			Perched			
MONITORING WELL Sampling Date			B-9 3/13/2018	B-9 6/21/2018	B-9 9/12/2018	B-9 12/12/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
CONVENTIONALS						
Chemical Oxygen Demand	mg/L		8 U	20 U	20 U	20 U
Total Organic Carbon	mg/L		3.41	1.54	1.51	1.32
Total Dissolved Solids †	mg/L	**500	160	167	158	149
Alkalinity †	mg/L		116	103.4	103.9	99.6
Bicarbonate †	mg CaCO3/L		117	103.4	103.9	99.6
Ammonia as nitrogen	mg/L		0.01	0.01 U	0.01	0.01 U
Nitrate as nitrogen	mg/L	*10	1.49	1.5	1.47	1.08
Nitrite as nitrogen	mg/L		0.1 U	0.1 U	0.1 U	0.1 U
Chloride	mg/L	**250	1.6	1.5	1.3	1.1
Sulfate	mg/L	**250	8.2	7.8	10.5	27
pH	SU	**6.5-8.5	6.69	6.8	6.85	7.18
Specific Conductance	µS/cm		220	256	217	224
Temperature	C		10.37	10.68	10.73	10.01
METALS						
Dissolved Antimony †	mg/L		0.00015 J	0.001 U	0.00017 J	0.0004 J
Dissolved Arsenic	mg/L	***0.00005	**0.0009 J**	**0.0008**	**0.0008**	**0.0006 J**
Dissolved Barium †	mg/L	*1.0	0.016	0.015	0.014	0.028
Dissolved Cadmium	mg/L	*0.01	8E-05 J	0.001 U	2E-05 J	0.001 U
Dissolved Chromium †	mg/L	*0.05	0.0008 J	0.0012	0.001	0.0006 J
Dissolved Cobalt †	mg/L		5E-05 J	0.001 U	3E-05 J	0.001 U
Dissolved Copper †	mg/L	**1.0	0.0015 J	0.0012	0.001 J	0.001 J
Dissolved Iron	mg/L	**0.3	0.05	0.05 U	0.05 U	0.05 U
Dissolved Lead	mg/L	*0.05	2.7E-05 J	0.001 U	0.0005 U	0.001 U
Dissolved Manganese	mg/L	**0.05	0.0003 J	0.001 U	0.00014 J	0.0007 J
Dissolved Mercury	mg/L	*0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dissolved Nickel †	mg/L		0.001	0.001 U	0.0004 J	0.0003 J
Dissolved Selenium †	mg/L	*0.01	0.002	0.002	0.001	0.0009 J
Dissolved Vanadium †	mg/L		0.0014 J	0.0021	0.002	0.001
Dissolved Zinc	mg/L	**5.0	0.0012 J	0.05 U	0.002 J	0.0025 U
Total Calcium	mg/L		25.9	22.5	19.9	19.9
Total Magnesium †	mg/L		17.6	15.9	13.8	14.1
Total Potassium †	mg/L		2.48	2.06	1.9	1.8
Total Sodium	mg/L		4.76	4.21	3.76	3.66

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen

Units:

mg/L = milligrams per liter
µg/L = micrograms per liter
SU = standard units
µS/cm = microsiemens per centimeter
C = degrees centigrade
mg CaCO3/L = milligrams of calcium carbonate per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.
NT — Not tested.

Results shown in bold exceed Ground Water Quality Criteria.
† Indicates supplement analytes measured due to Ecology request

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Perched			
MONITORING WELL Sampling Date			B-6 3/13/2018	B-6 6/20/2018	B-6 9/11/2018	B-6 12/10/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
1,1,1,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,1-trichloroethane	µg/L	200*	0.4 U	0.4 U	0.4 U	0.4 U
1,1,2,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichlorofluorotoluene (Freon-113)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethane	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethene	µg/L	7****	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2****	1 U	1 U	1 U	1 U
1,2-dibromoethane (EDB)	µg/L	0.001***	0.01 U	0.01 U	0.01 U	0.01 U
1,2-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloroethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloropropane	µg/L	0.6***	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,3-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,4-dichlorobenzene	µg/L	4***	0.4 U	0.4 U	0.4 U	0.4 U
1,4-dioxane	µg/L	7***	5 U	5 U	5 U	5 U
2,2-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-butanone	µg/L		3 U	3 U	3 U	3 U
2-chloroethyl vinyl ether	µg/L		2 U	2 U	2 U	2 U
2-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-nitropropane	µg/L		10 U	10 U	10 U	10 U
2-phenylbutane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-methyl-2-pentanone	µg/L		4 U	4 U	4 U	4 U
Acetone	µg/L		3 U	3 U	3 U	3 U
Acrolein	µg/L		4 U	4 U	4 U	4 U
Acrylonitrile	µg/L	0.07***	0.05 U	0.05 U	0.05 U	0.05 U
Allyl chloride	µg/L		2 U	2 U	2 U	2 U
Benzene	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Bromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon disulfide	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon tetrachloride	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chlorodibromomethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorodifluoromethane (Freon-22)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroform	µg/L	7.0***	0.4 U	0.4 U	0.4 U	0.4 U
Chloromethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
cis-1,2-dichloroethene	µg/L	70****	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Cymene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dibromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichlorodifluoromethane (CFC-12)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichloromethane	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Dichloromonofluoromethane (Freon-21)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Diethyl ether	µg/L		0.4 U	0.4 U	0.4 U	0.4 U

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Perched			
MONITORING WELL Sampling Date			B-6 3/13/2018	B-6 6/20/2018	B-6 9/11/2018	B-6 12/10/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
Ethyl methacrylate	µg/L		3 U	3 U	3 U	3 U
Ethylbenzene	µg/L	700****	0.4 U	0.4 U	0.4 U	0.4 U
Hexachloro-1,3-butadiene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Hexachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Isopropylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m+p-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Methyl acrylate	µg/L		2 U	2 U	2 U	2 U
Methyl iodide	µg/L		5 U	5 U	5 U	5 U
Methyl methacrylate	µg/L		2 U	2 U	2 U	2 U
Methyl n-butyl ketone	µg/L		5 U	5 U	5 U	5 U
Methyl tert-butyl ether	µg/L		1 U	1 U	1 U	1 U
Methylacrylonitrile	µg/L		4 U	4 U	4 U	4 U
Naphthalene	µg/L		1 U	1 U	1 U	1 U
n-butyl chloride	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-propylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
o-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Pentachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Styrene (monomer)	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Tert-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Tetrachloroethene	µg/L	0.8***	0.4 U	0.4 U	0.4 U	0.4 U
Tetrahydrofuran	µg/L		3 U	3 U	3 U	3 U
Toluene	µg/L	1****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,2-dichloroethene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,4-dichlorobutene	µg/L		5 U	5 U	5 U	5 U
Tribromomethane (Bromoform)	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	µg/L	3***	0.4 U	0.4 U	0.4 U	0.4 U
Trichlorofluoromethane (CFC-11)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Vinyl chloride	µg/L	0.02***	0.01 U	0.01 U	0.01 U	0.01 U

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen
**** = 246-290 WAC criteria

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.

J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

Units:

µg/L= micrograms per liter

Results shown in bold exceed Ground Water Quality Criteria.

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Perched			
MONITORING WELL Sampling Date			B-9 3/13/2018	B-9 6/21/2018	B-9 9/12/2018	B-9 12/12/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
1,1,1,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,1-trichloroethane	µg/L	200*	0.4 U	0.4 U	0.4 U	0.4 U
1,1,2,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichlorofluorotoluene (Freon-113)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethane	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethene	µg/L	7****	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2****	1 U	1 U	0.4 U	1 U
1,2-dibromoethane (EDB)	µg/L	0.001***	0.01 U	0.01 U	0.01 U	0.01 U
1,2-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloroethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloropropane	µg/L	0.6***	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,3-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,4-dichlorobenzene	µg/L	4***	0.4 U	0.4 U	0.4 U	0.4 U
1,4-dioxane	µg/L	7***	5 U	5 U	5 U	5 U
2,2-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-butanone	µg/L		3 U	3 U	3 U	3 U
2-chloroethyl vinyl ether	µg/L		2 U	2 U	2 U	2 U
2-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-nitropropane	µg/L		10 U	10 U	3 U	10 U
2-phenylbutane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-methyl-2-pentanone	µg/L		4 U	4 U	4 U	4 U
Acetone	µg/L		3 U	3 U	2 U	3 U
Acrolein	µg/L		4 U	4 U	2 U	4 U
Acrylonitrile	µg/L	0.07***	0.05 U	0.05 U	0.05 U	0.05 U
Allyl chloride	µg/L		2 U	2 U	2 U	2 U
Benzene	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Bromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon disulfide	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon tetrachloride	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chlorodibromomethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorodifluoromethane (Freon-22)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroform	µg/L	7.0***	0.4 U	0.4 U	0.4 U	0.4 U
Chloromethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
cis-1,2-dichloroethene	µg/L	70****	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Cymene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dibromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichlorodifluoromethane (CFC-12)	µg/L		0.5	0.4	0.4	0.7
Dichloromethane	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Dichloromonofluoromethane (Freon-21)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Diethyl ether	µg/L		0.4 U	0.4 U	0.4 U	0.4 U

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Perched			
MONITORING WELL Sampling Date			B-9 3/13/2018	B-9 6/21/2018	B-9 9/12/2018	B-9 12/12/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
Ethyl methacrylate	µg/L		3 U	3 U	3 U	3 U
Ethylbenzene	µg/L	700****	0.4 U	0.4 U	0.4 U	0.4 U
Hexachloro-1,3-butadiene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Hexachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Isopropylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m+p-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Methyl acrylate	µg/L		2 U	2 U	2 U	2 U
Methyl iodide	µg/L		5 U	5 U	2 U	5 U
Methyl methacrylate	µg/L		2 U	2 U	2 U	2 U
Methyl n-butyl ketone	µg/L		5 U	5 U	5 U	5 U
Methyl tert-butyl ether	µg/L		1 U	1 U	0.4 U	1 U
Methylacrylonitrile	µg/L		4 U	4 U	2 U	4 U
Naphthalene	µg/L		1 U	1 U	1 U	1 U
n-butyl chloride	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-propylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
o-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Pentachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Styrene (monomer)	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Tert-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Tetrachloroethene	µg/L	0.8***	0.4 U	0.4 U	0.4 U	0.4 U
Tetrahydrofuran	µg/L		3 U	3 U	2 U	3 U
Toluene	µg/L	1****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,2-dichloroethene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,4-dichlorobutene	µg/L		5 U	5 U	0.4 U	5 U
Tribromomethane (Bromoform)	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	µg/L	3***	0.4 U	0.4 U	0.4 U	0.4 U
Trichlorofluoromethane (CFC-11)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Vinyl chloride	µg/L	0.02***	0.01 U	0.01 U	0.01 U	0.01 U

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen
**** = 246-290 WAC criteria

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.

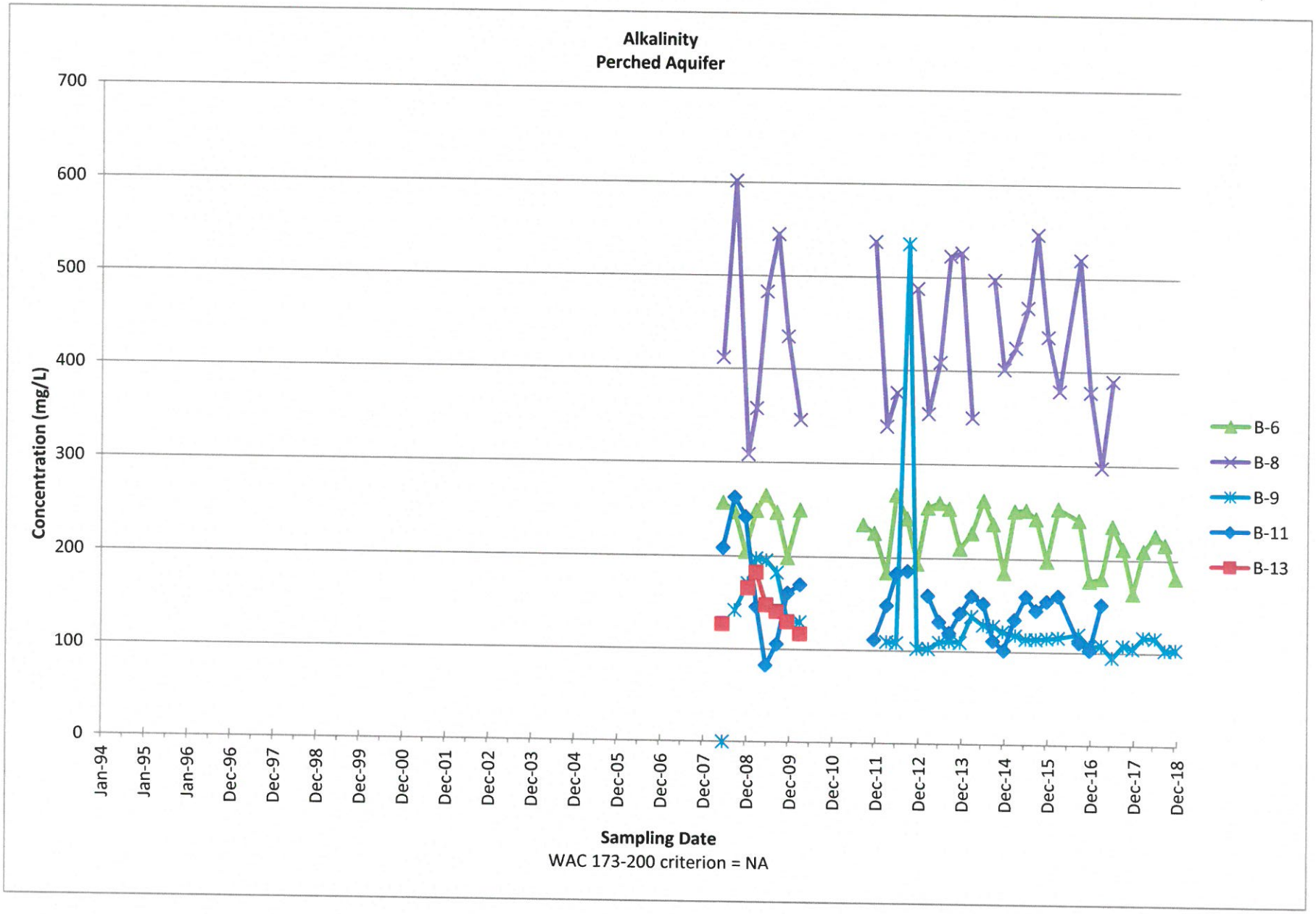
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

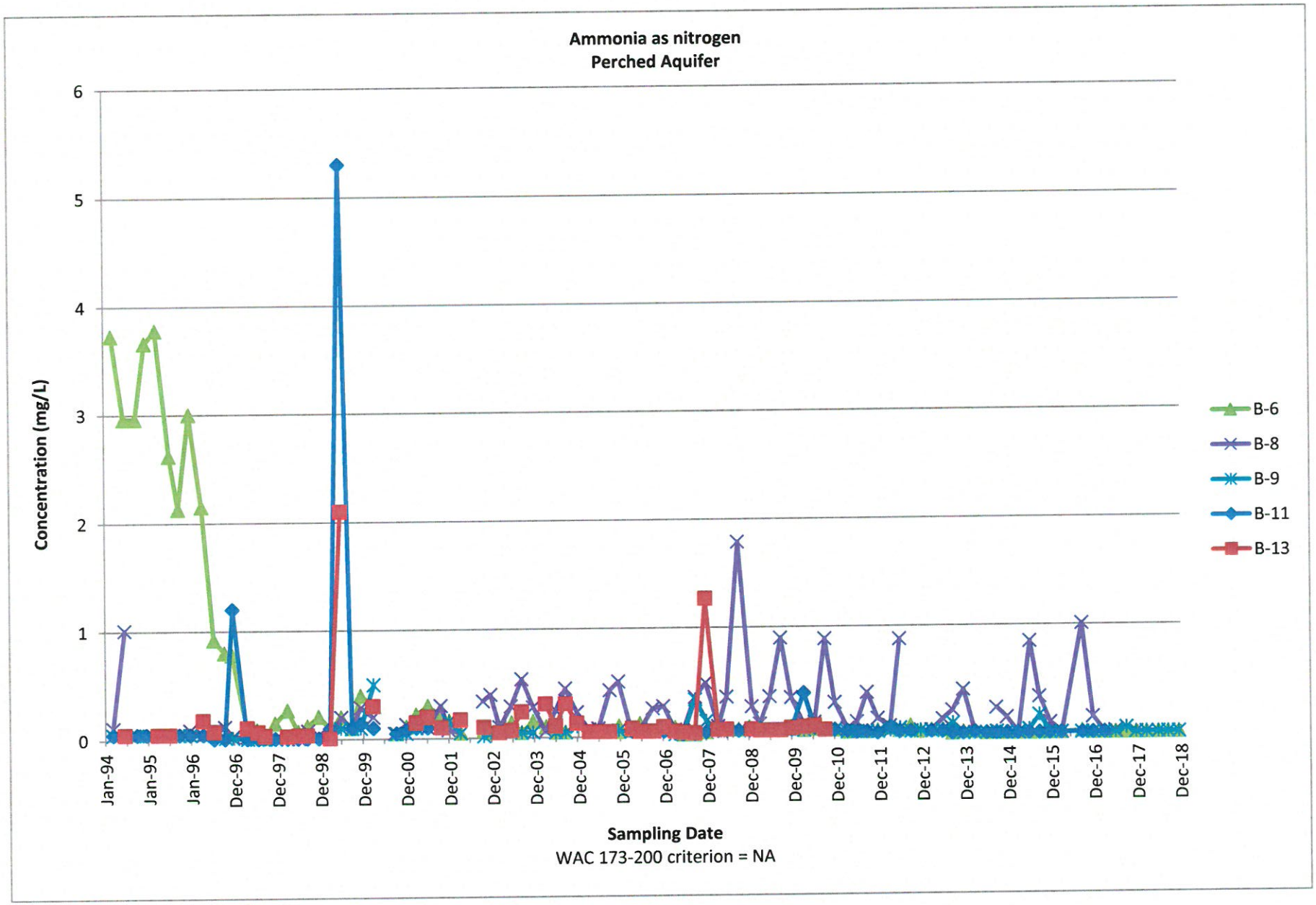
Units:

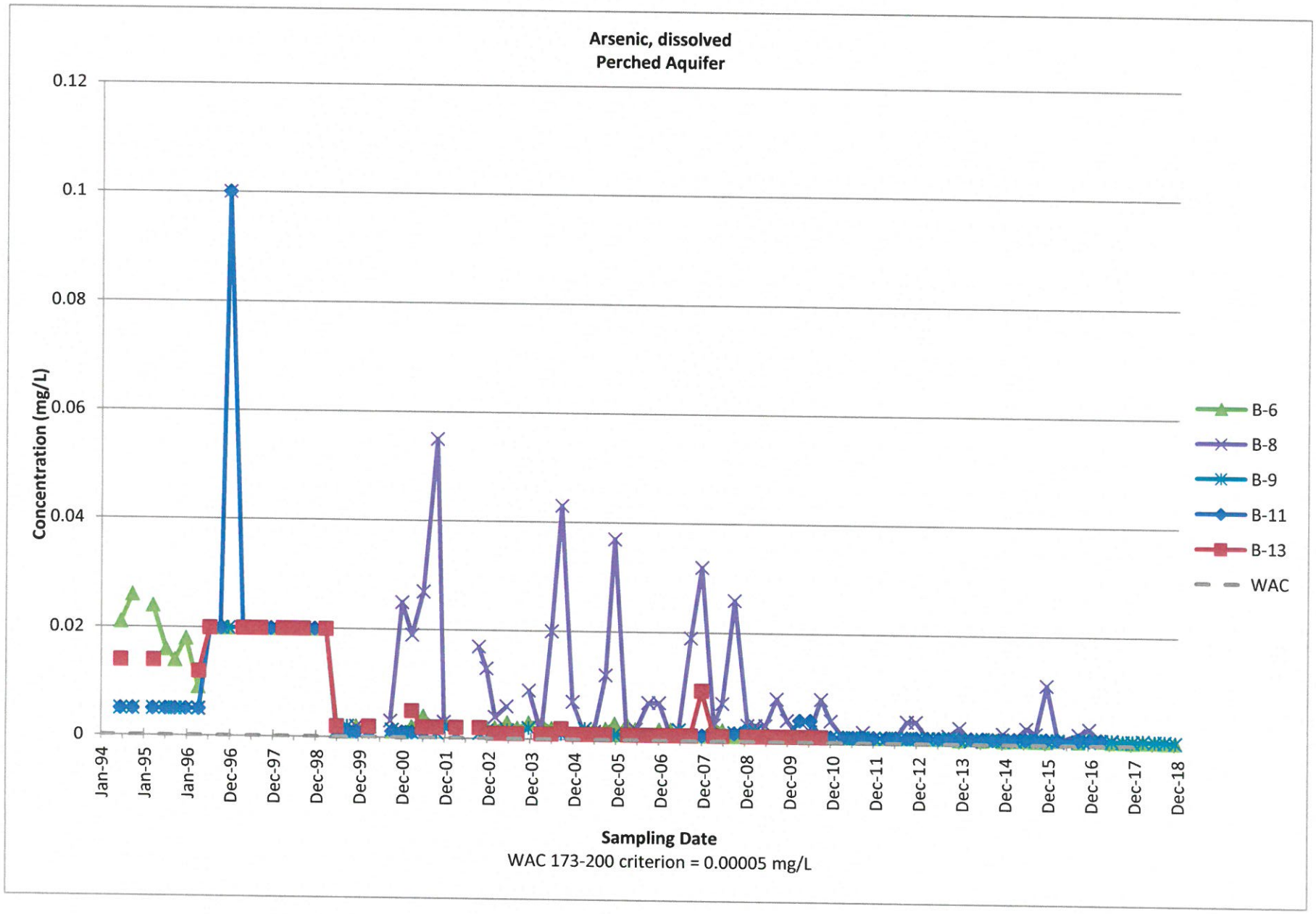
µg/L= micrograms per liter

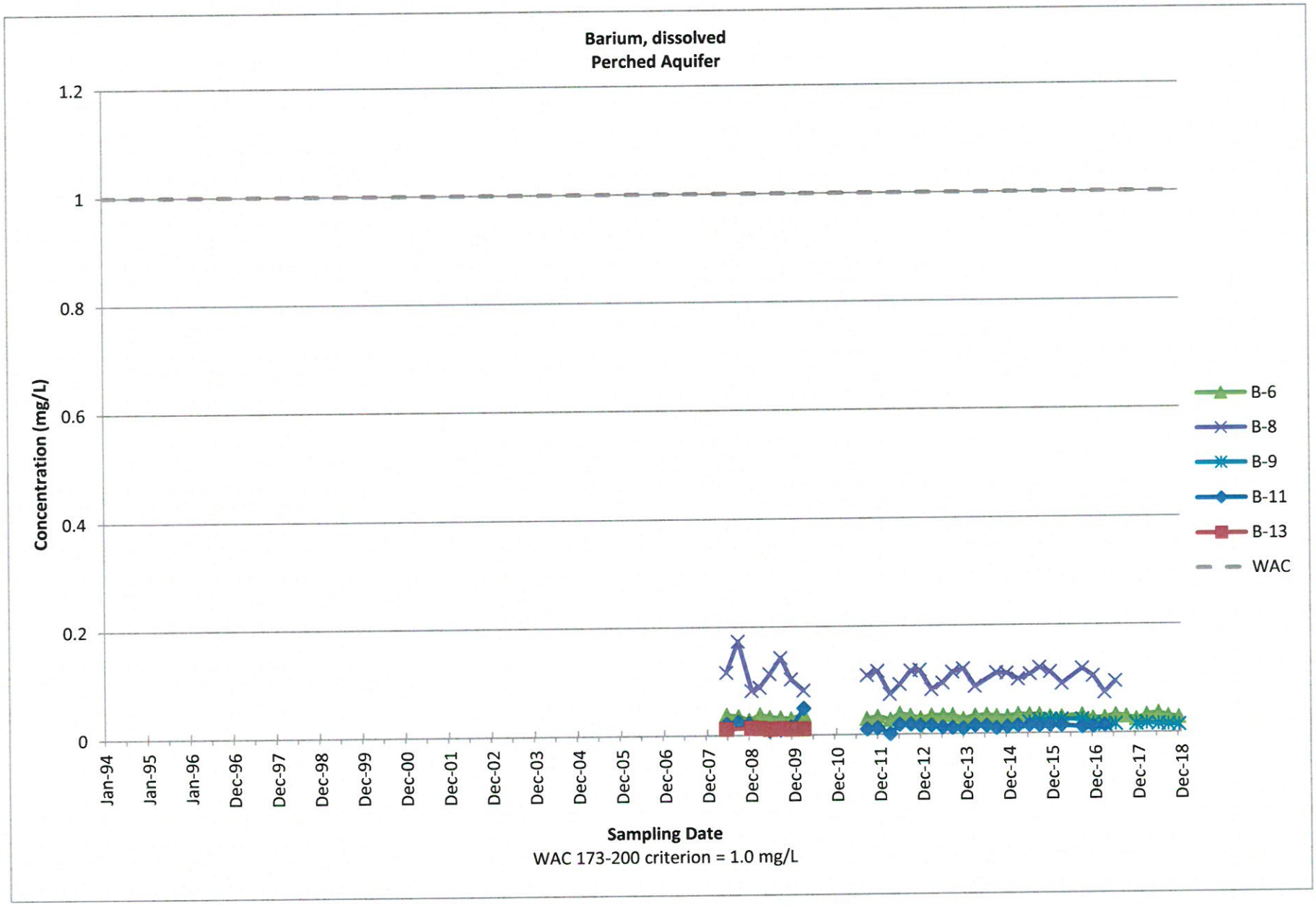
Results shown in bold exceed Ground Water Quality Criteria.

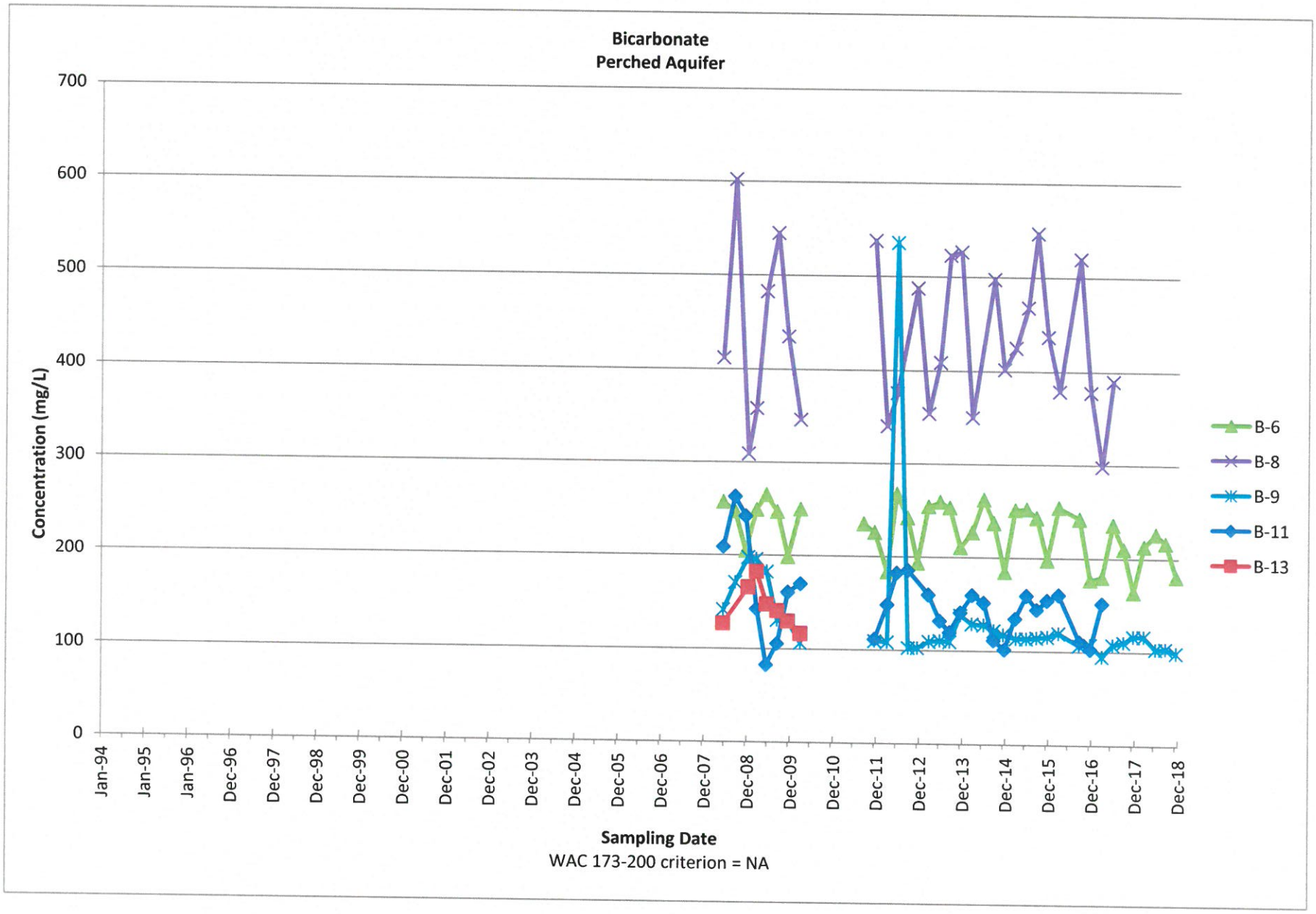
APPENDIX A-2:
Long Term Time Series Plots 1994-2018 – Perched Aquifer

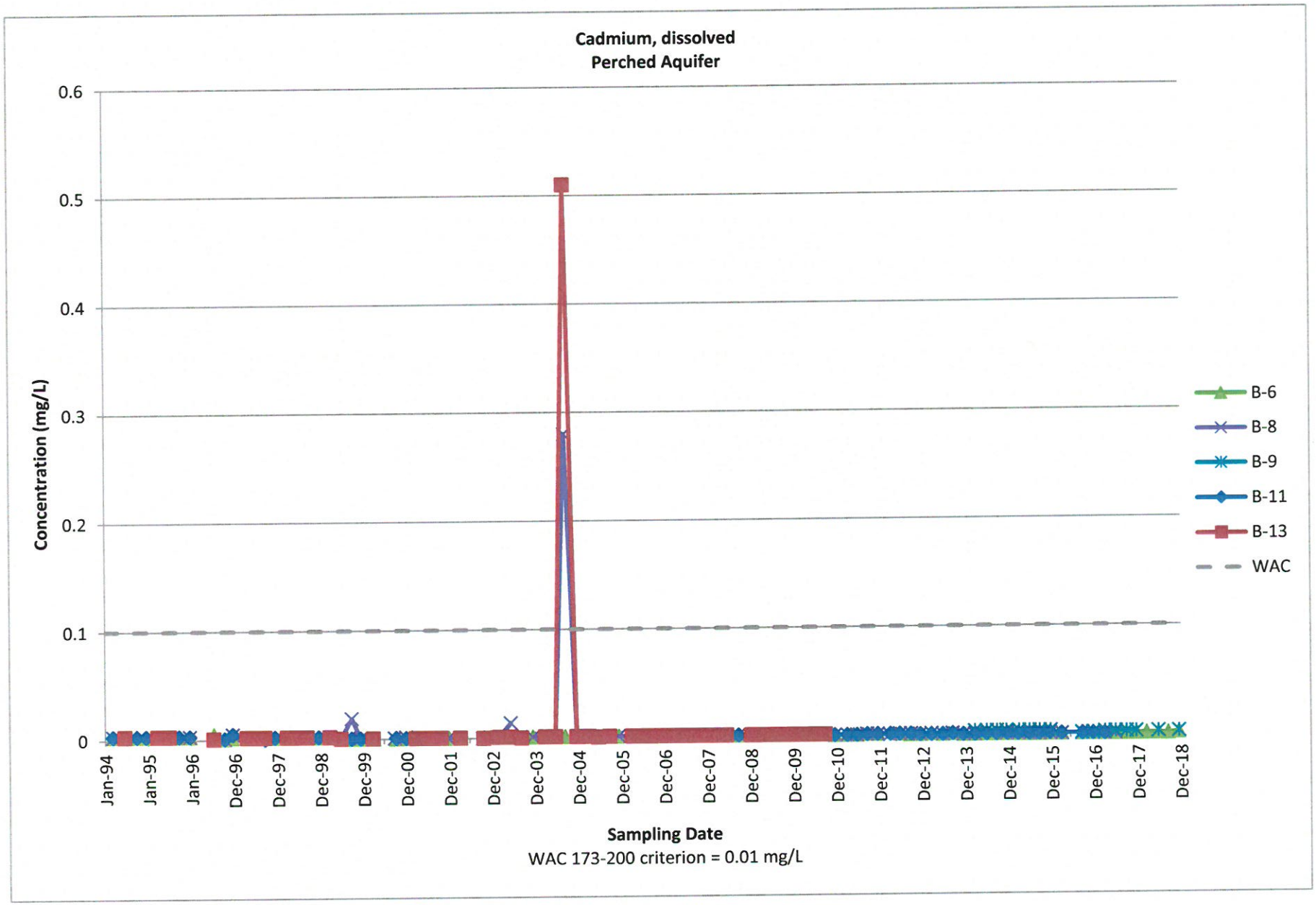

Alkalinity
Perched Aquifer
700
600
500
400
300
200
100
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

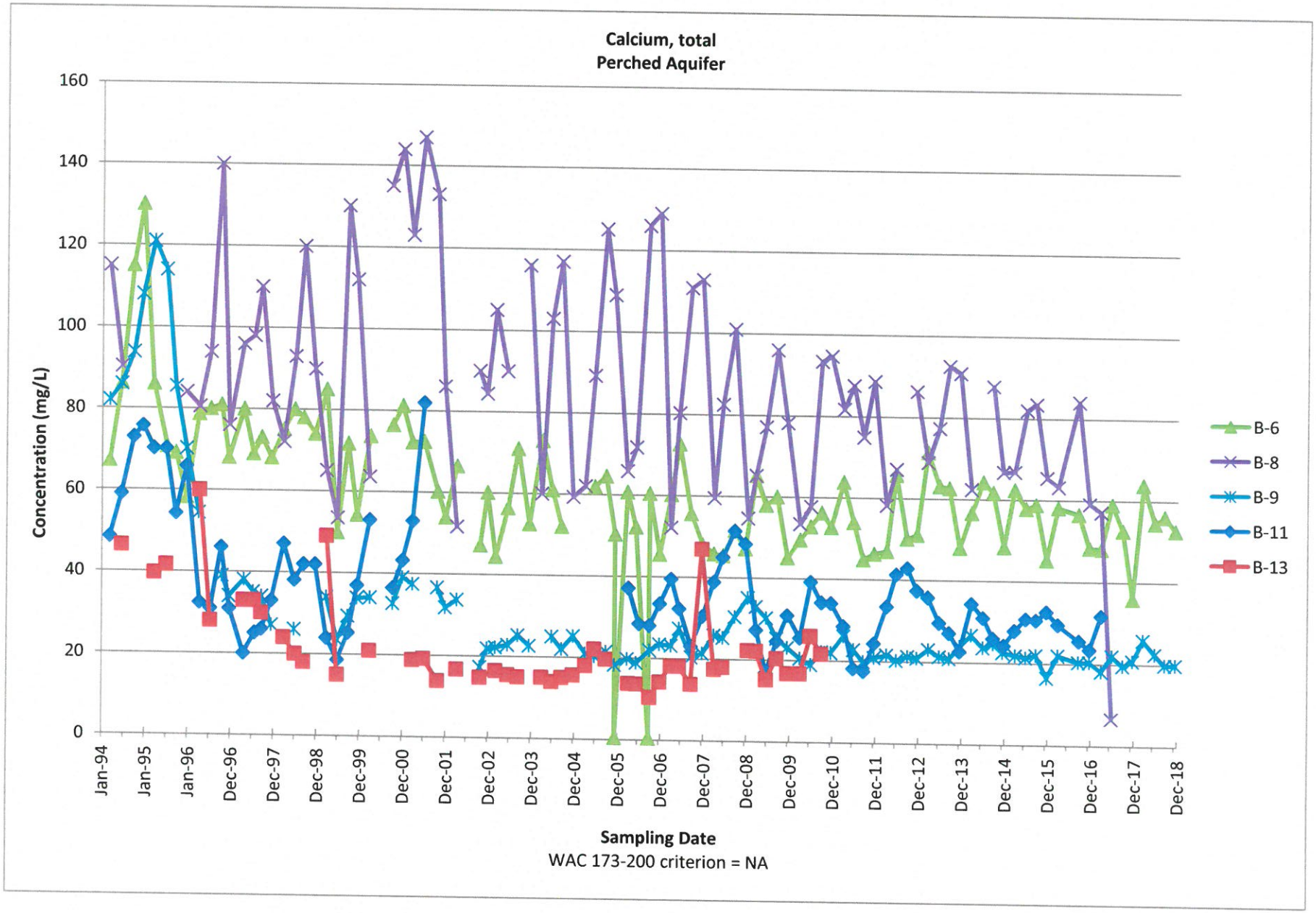

Ammonia as nitrogen
Perched Aquifer
Concentration (mg/L)
0
1
2
3
4
5
6
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

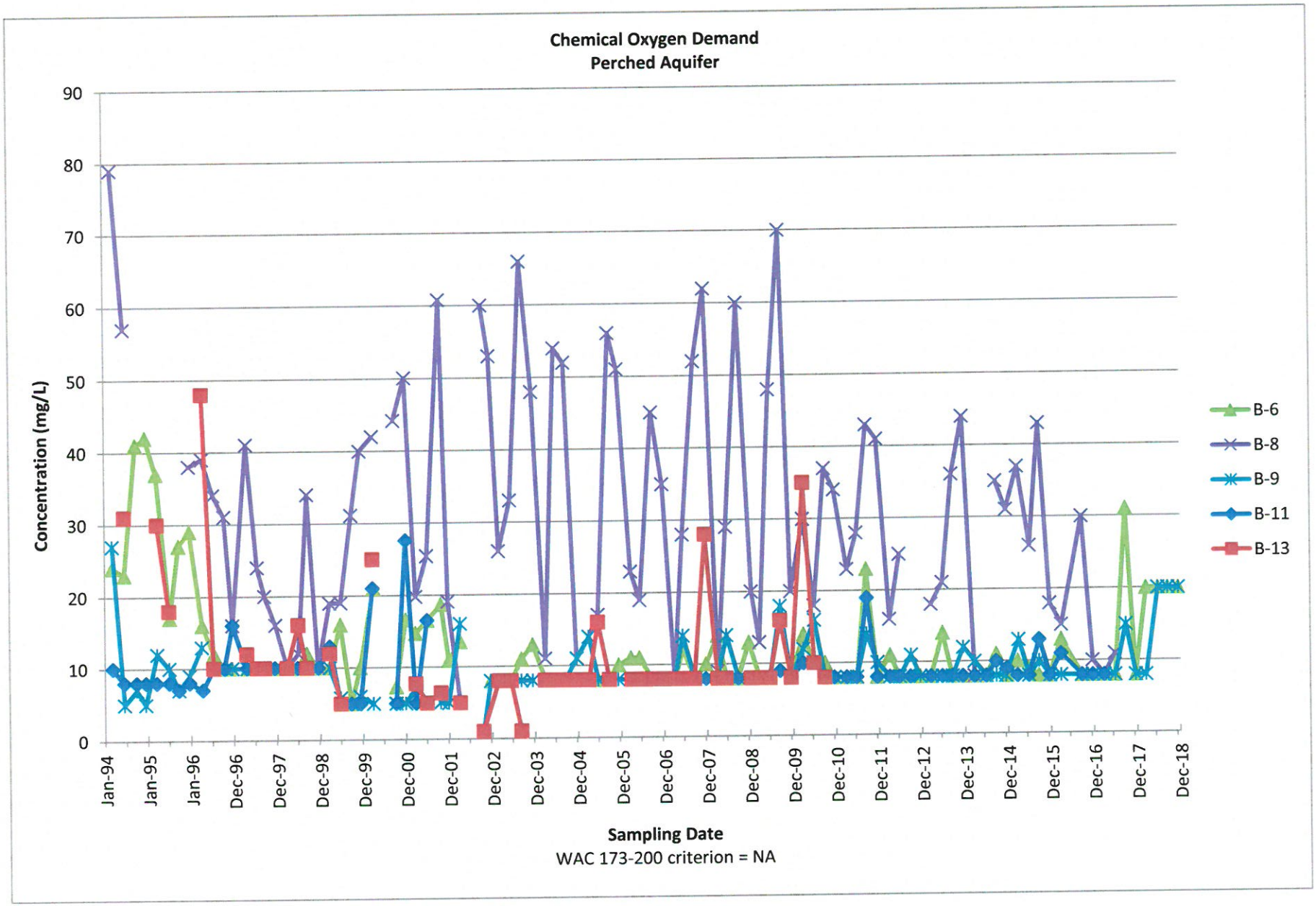

Arsenic, dissolved
Perched Aquifer
0.12
0.1
0.08
0.06
0.04
0.02
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-6
B-8
B-9
B-11
B-13
WAC
WAC 173-200 criterion = 0.00005 mg/L

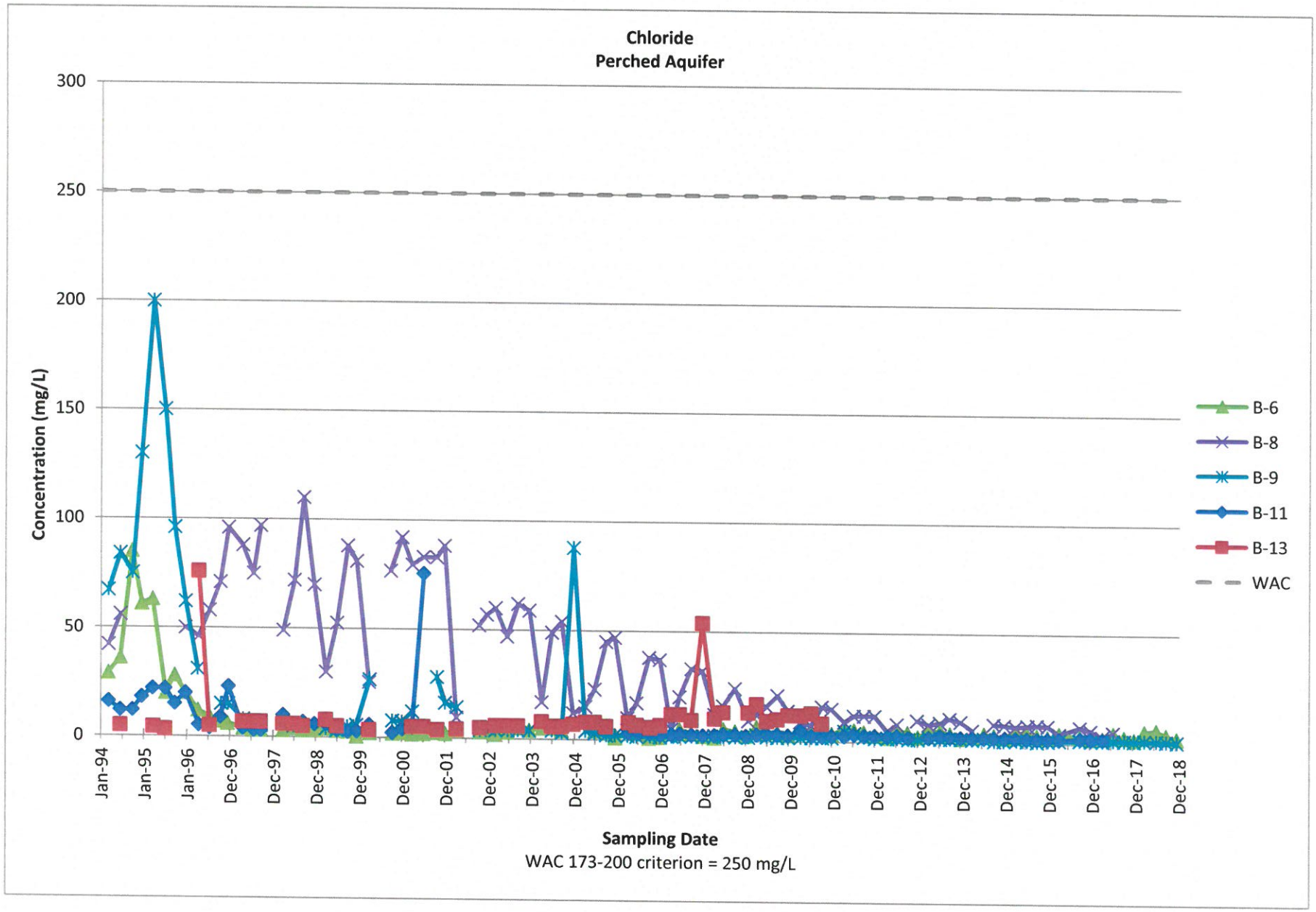

Barium, dissolved
Perched Aquifer
1.2
1
0.8
0.6
0.4
0.2
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-6
B-8
B-9
B-11
B-13
WAC
WAC 173-200 criterion = 1.0 mg/L

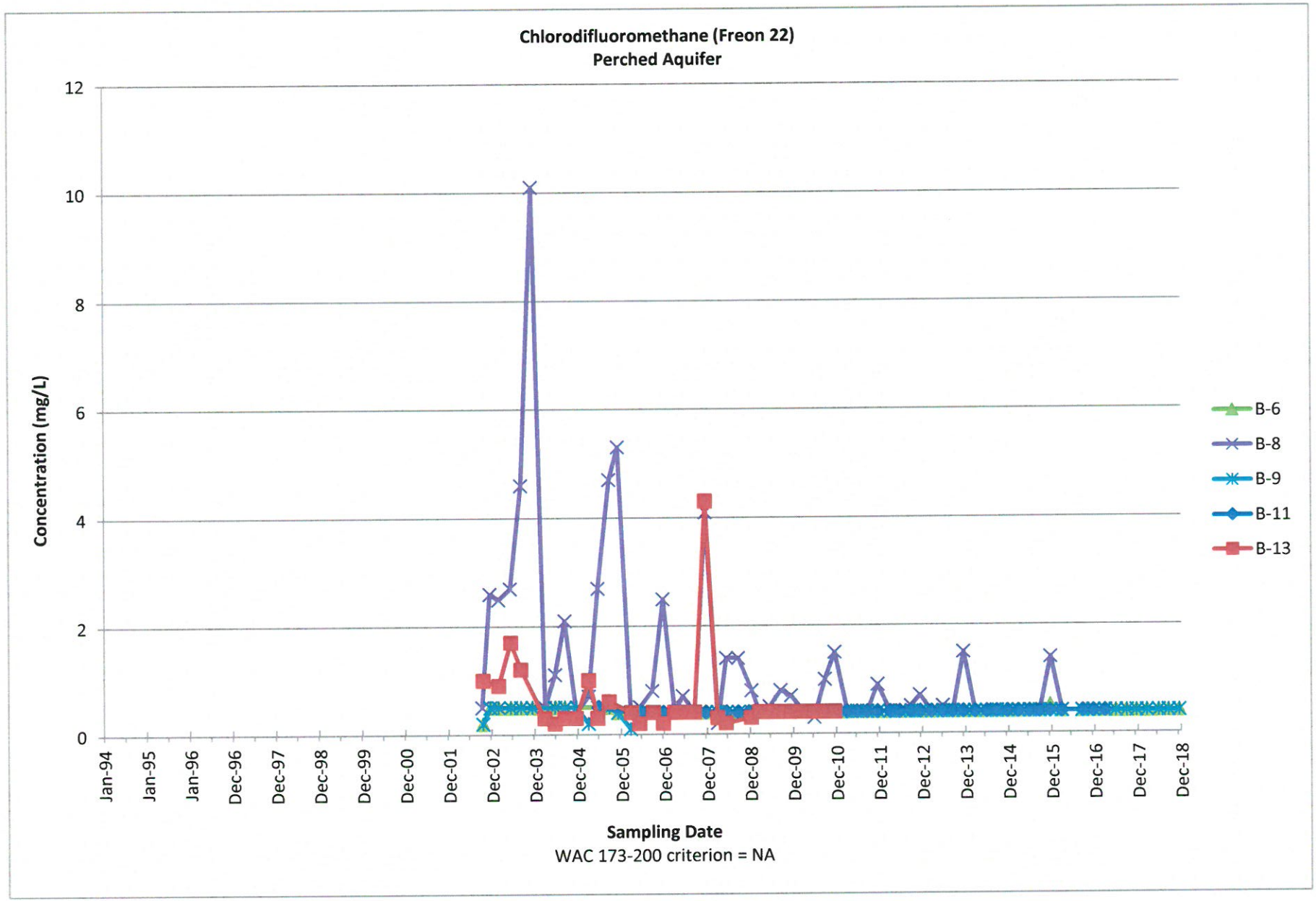

Bicarbonate
Perched Aquifer
700
600
500
400
300
200
100
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

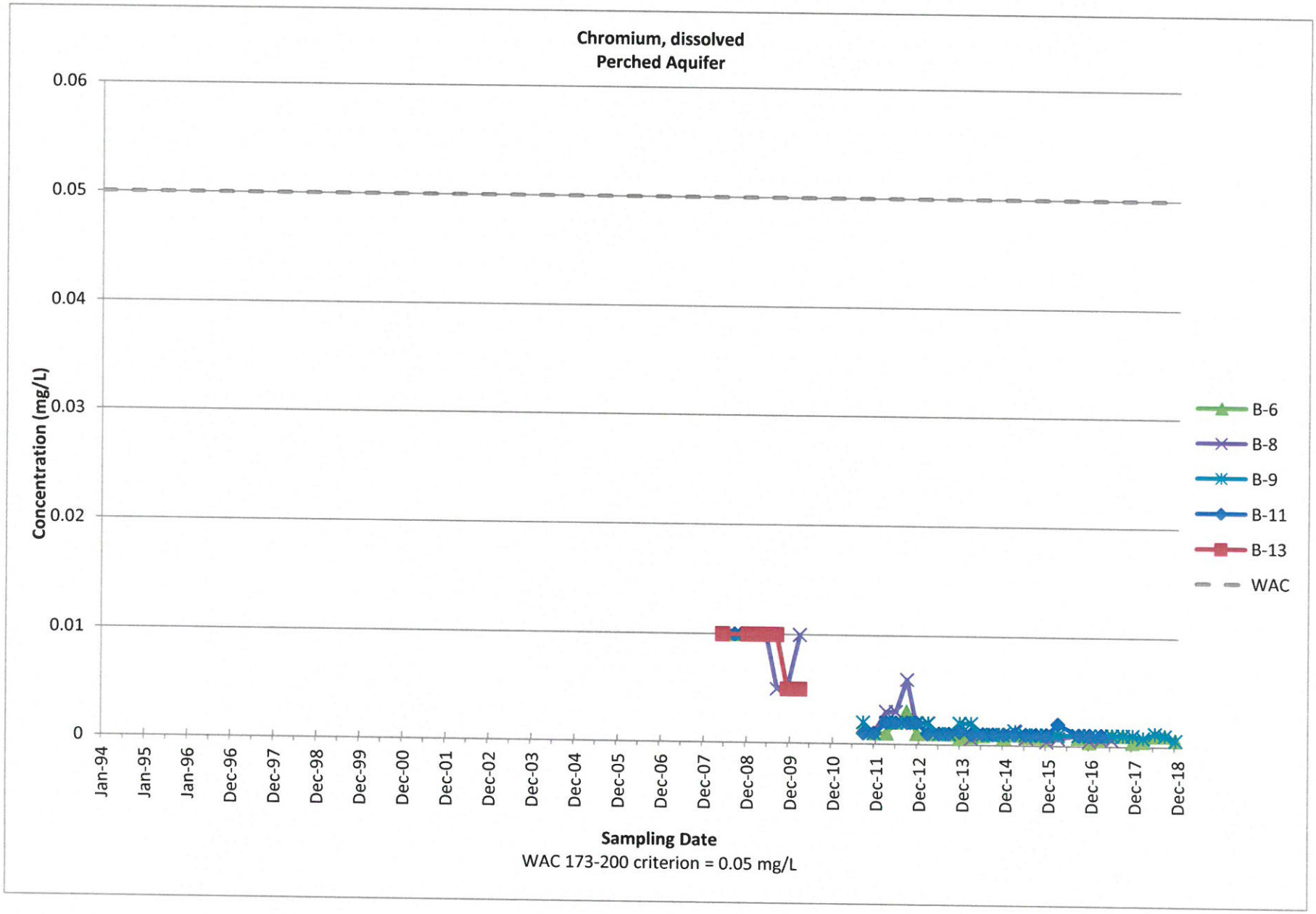

Cadmium, dissolved
Perched Aquifer
Concentration (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
WAC
Sampling Date
WAC 173-200 criterion = 0.01 mg/L

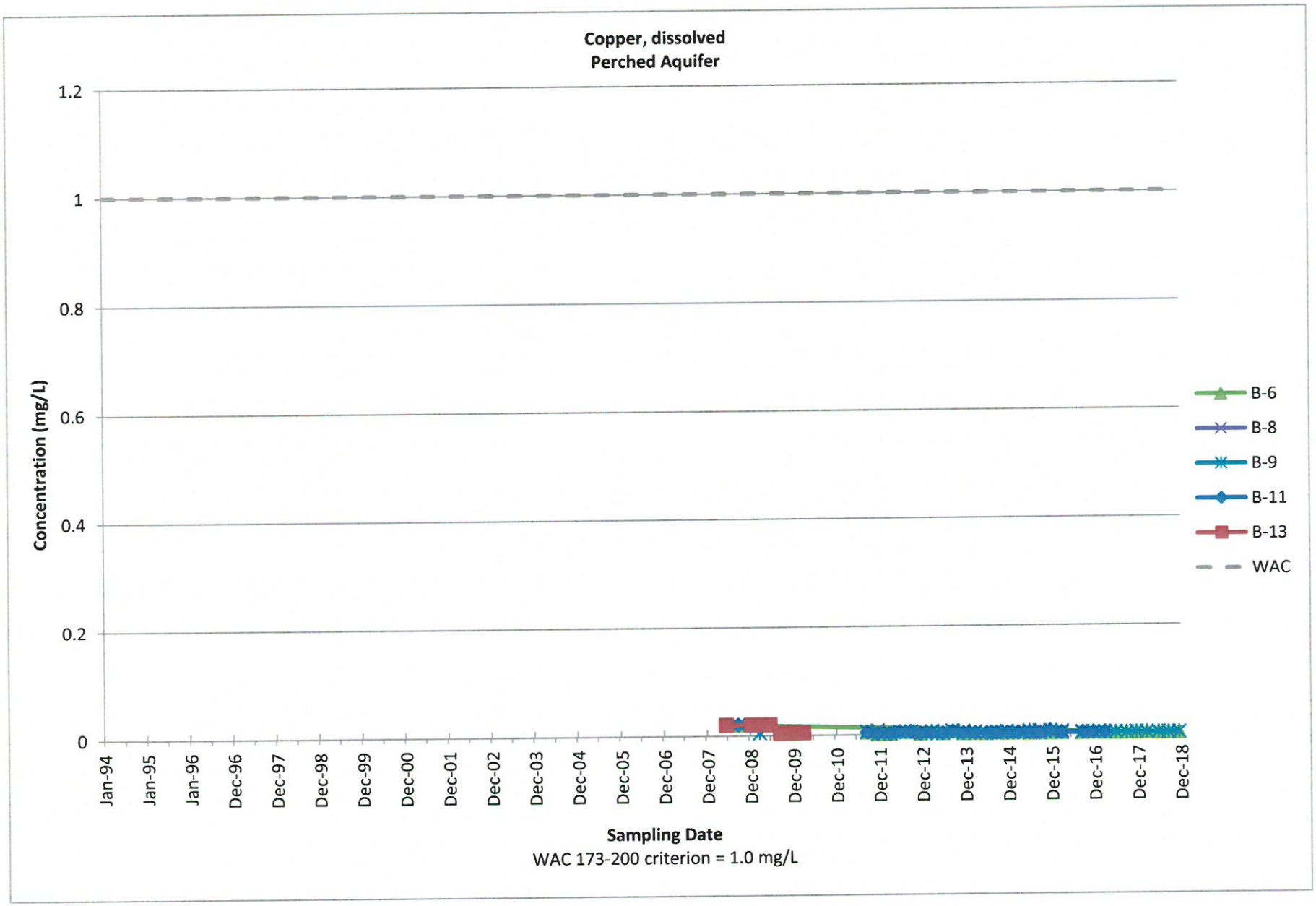

Calcium, total
Perched Aquifer
160
140
120
100
80
60
40
20
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

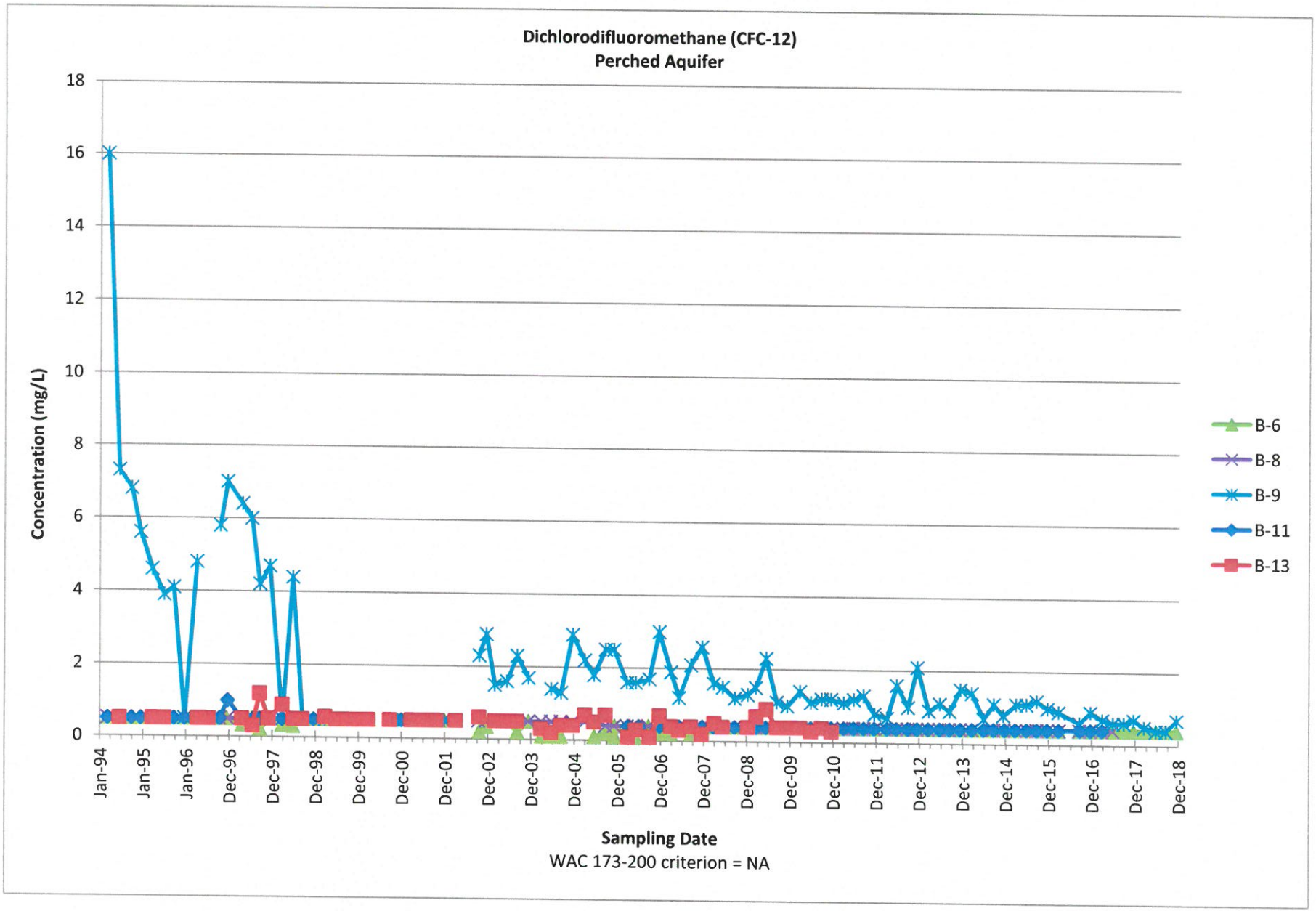

Chemical Oxygen Demand
Perched Aquifer
Concentration (mg/L)
90
80
70
60
50
40
30
20
10
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
Sampling Date
WAC 173-200 criterion = NA

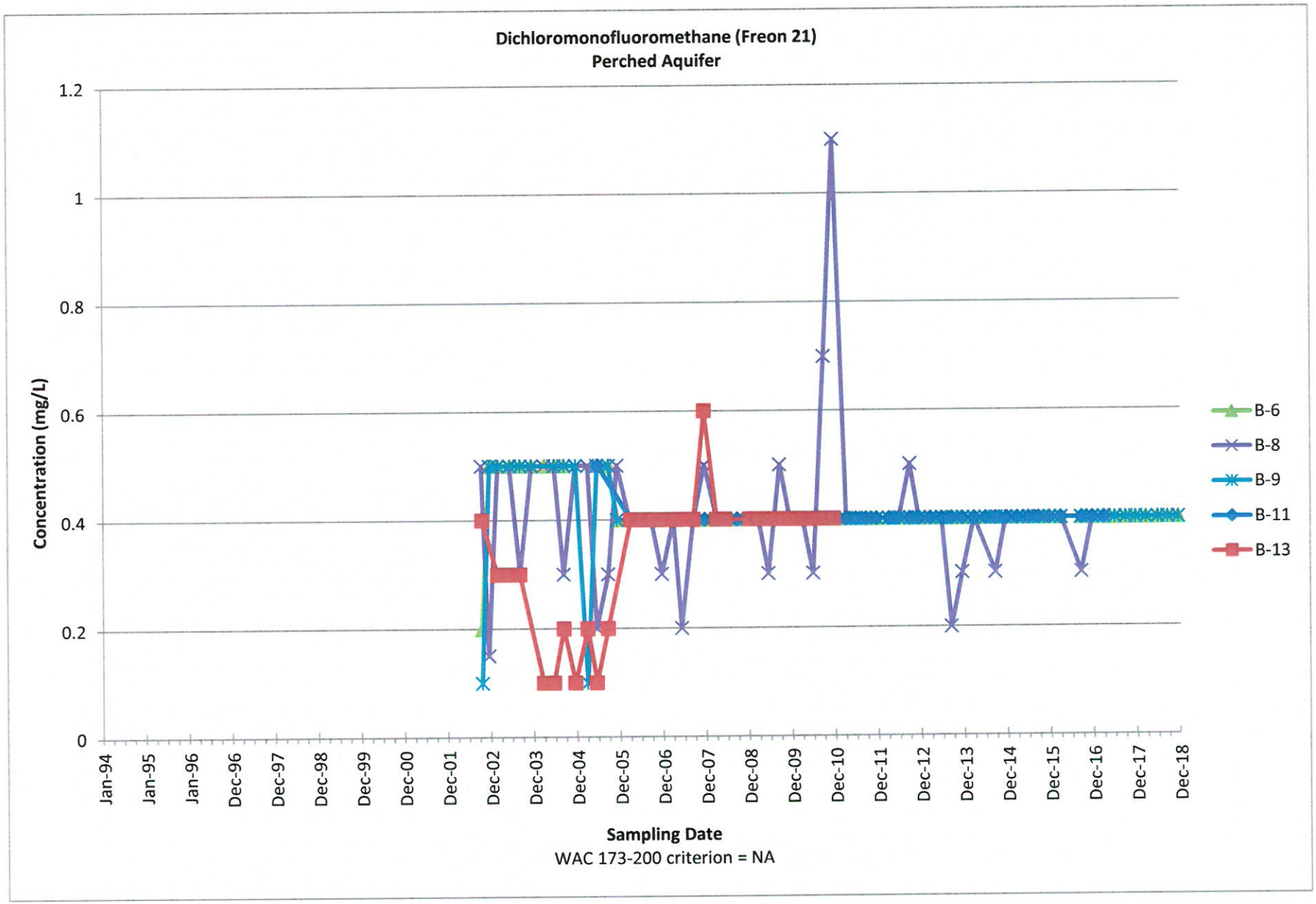

Chloride
Perched Aquifer
300
250
200
150
100
50
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-6
B-8
B-9
B-11
B-13
WAC
WAC 173-200 criterion = 250 mg/L

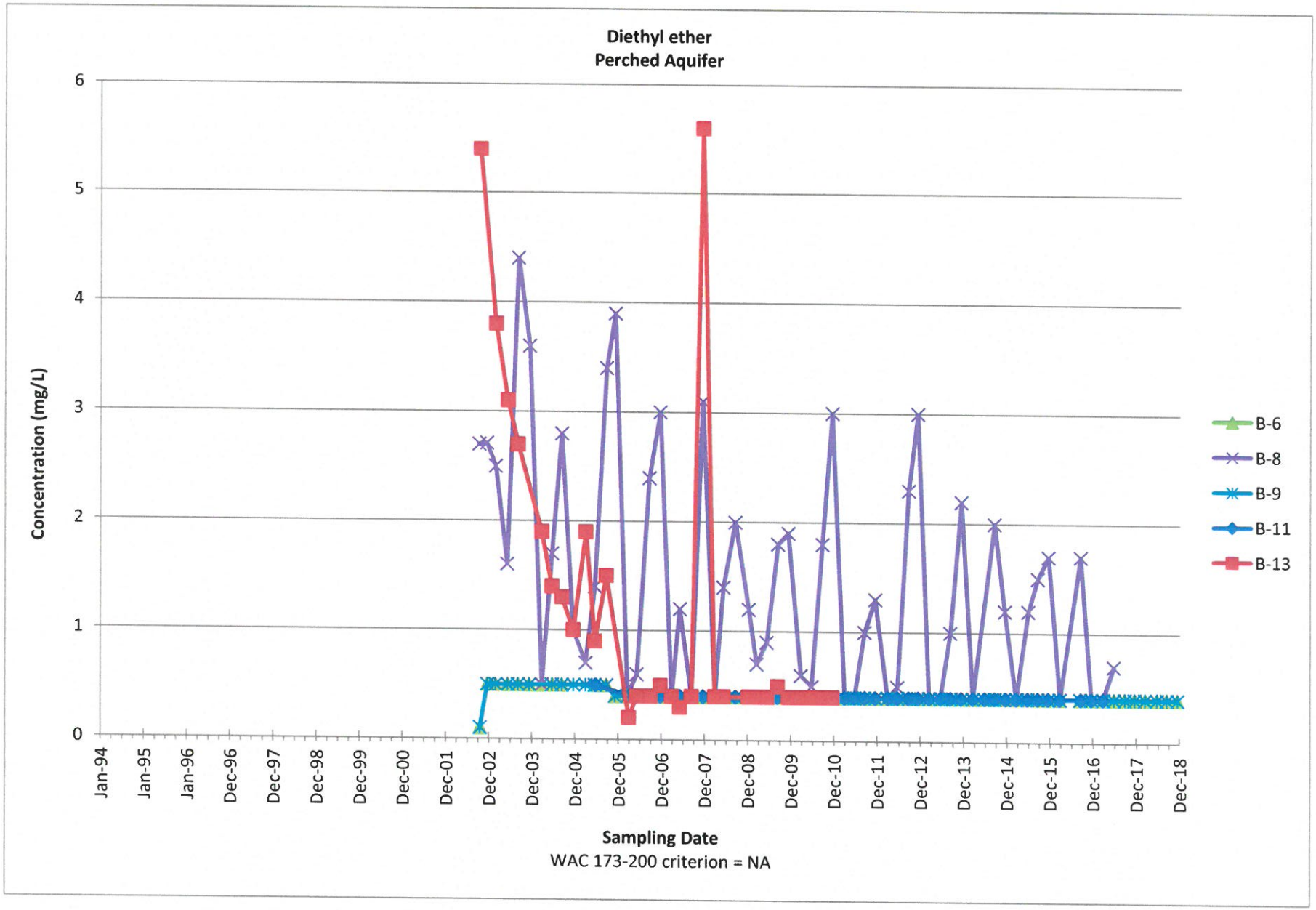

Chlorodifluoromethane (Freon 22)
Perched Aquifer
Concentration (mg/L)
12
10
8
6
4
2
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

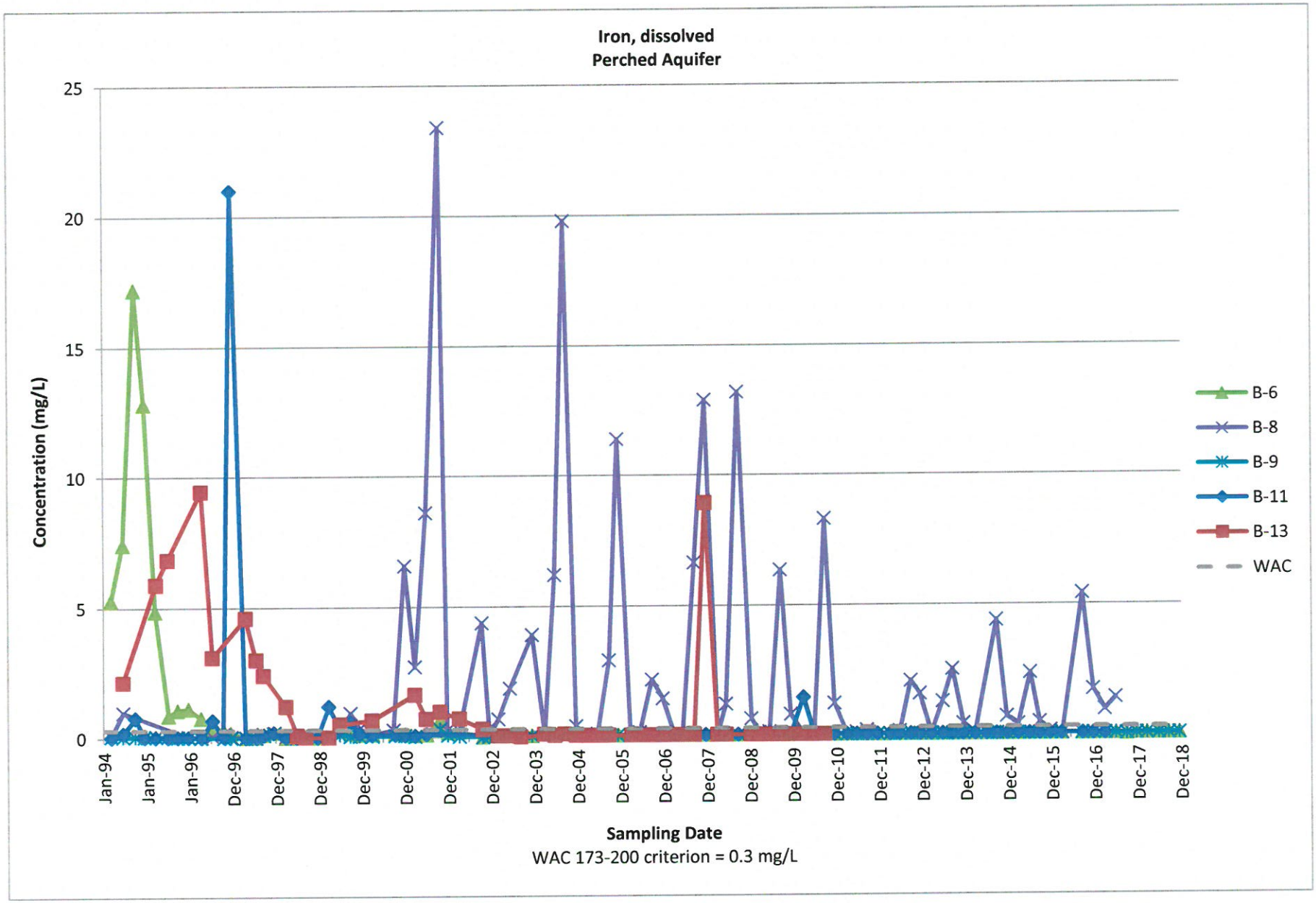

Chromium, dissolved
Perched Aquifer
0.06
0.05
0.04
0.03
0.02
0.01
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-6
B-8
B-9
B-11
B-13
WAC
WAC 173-200 criterion = 0.05 mg/L

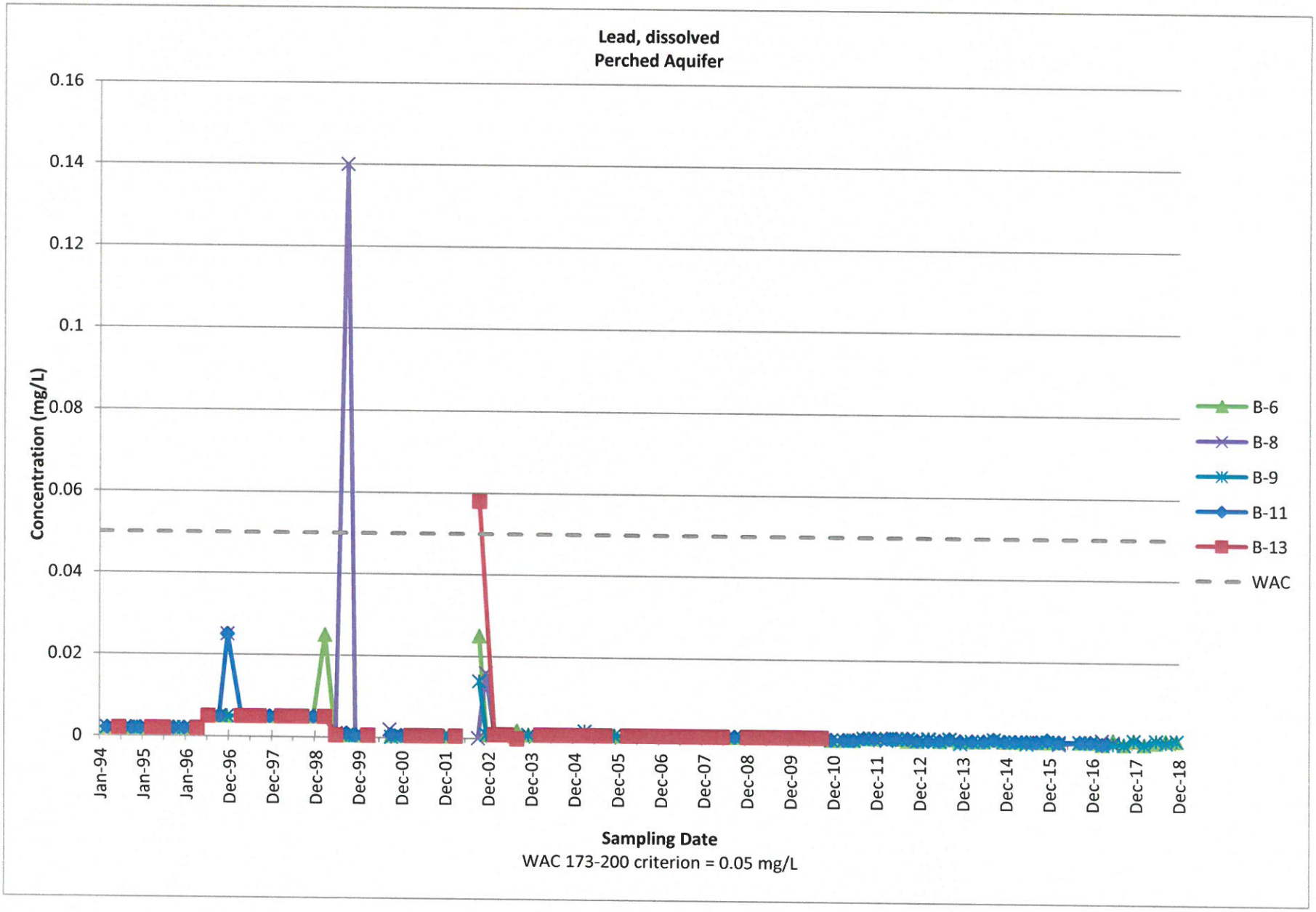

Copper, dissolved
Perched Aquifer
1.2
1
0.8
0.6
0.4
0.2
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-6
B-8
B-9
B-11
B-13
WAC
WAC 173-200 criterion = 1.0 mg/L

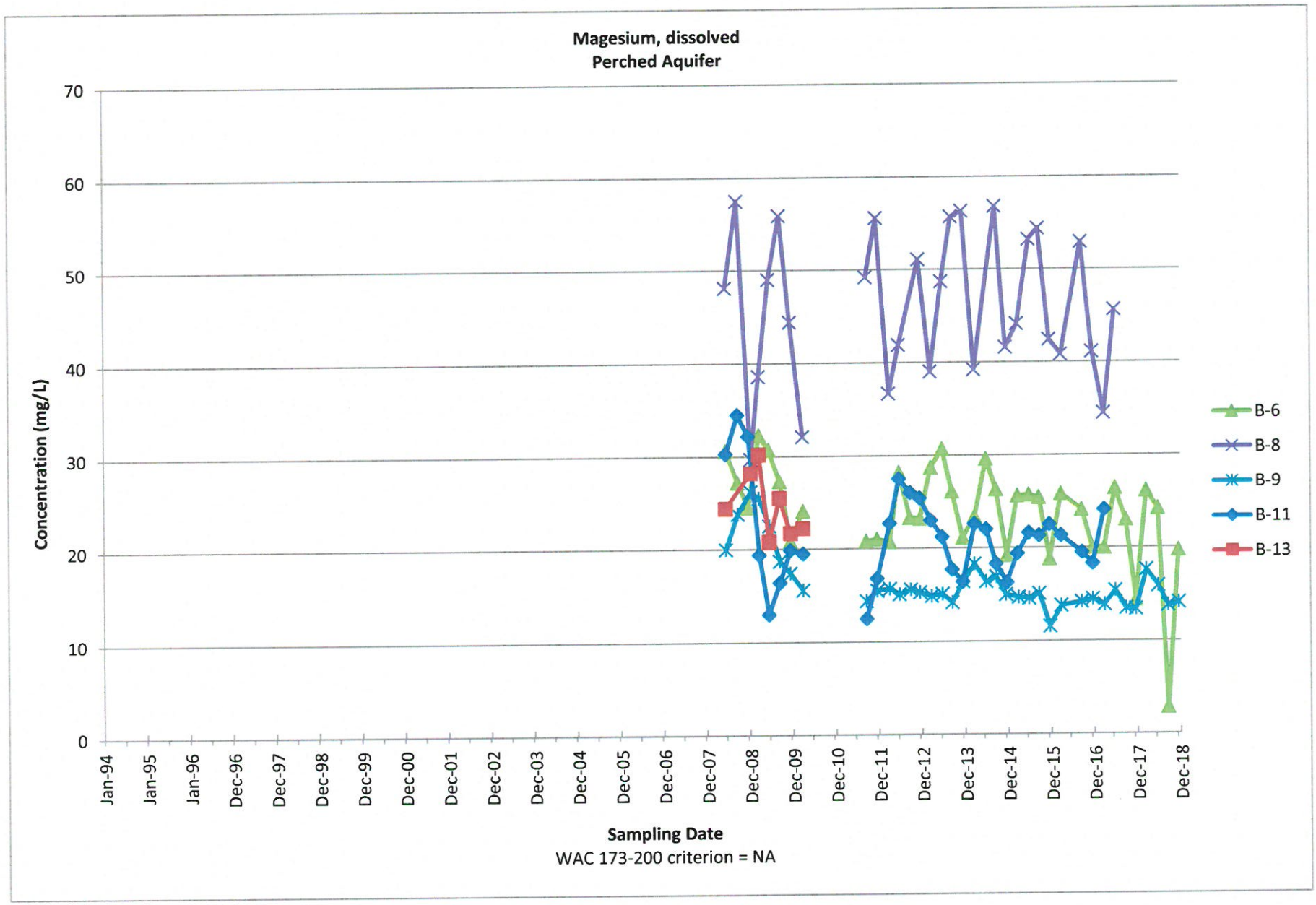

Dichlorodifluoromethane (CFC-12)
Perched Aquifer
Concentration (mg/L)
18
16
14
12
10
8
6
4
2
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

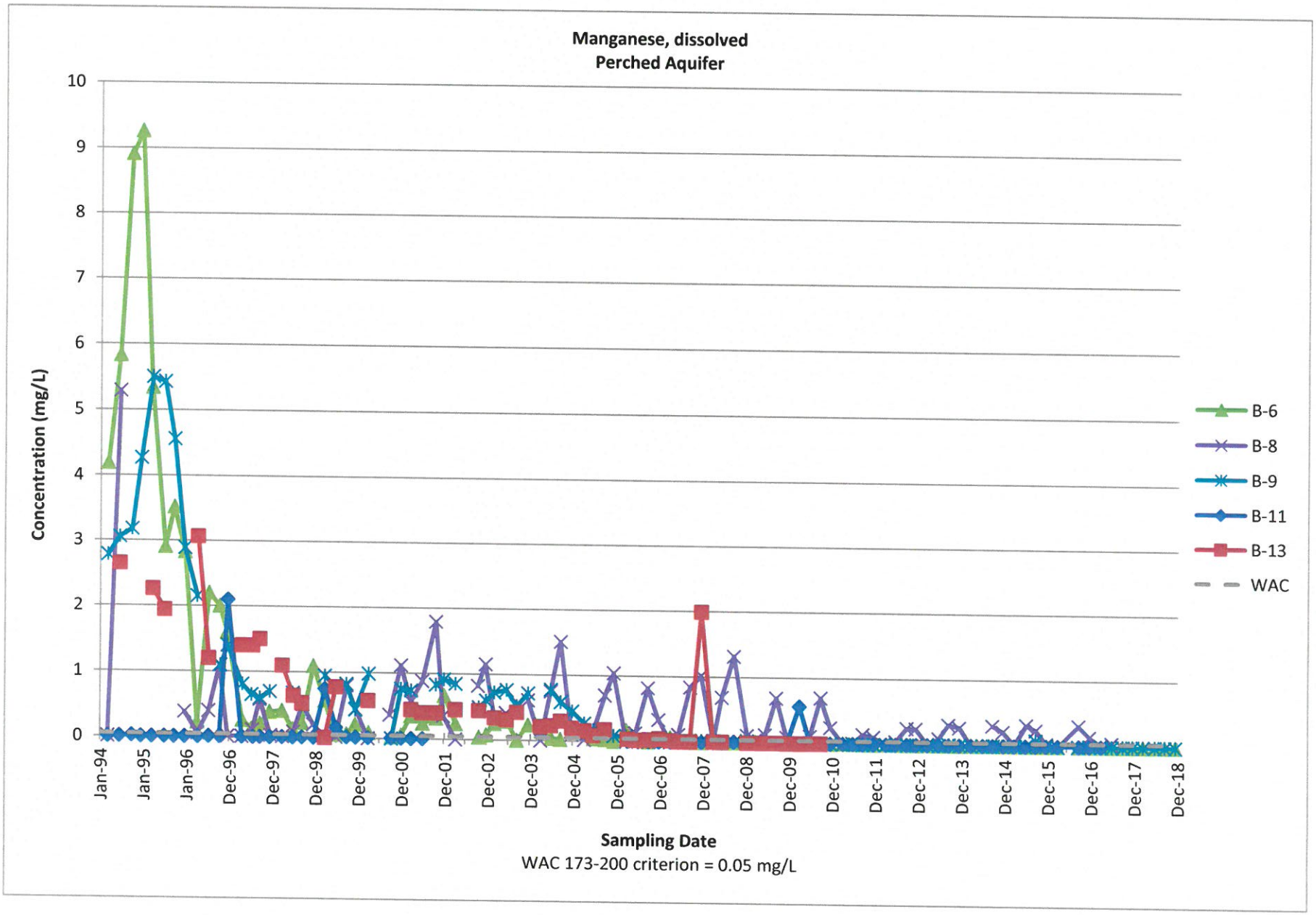

Dichloromonofluoromethane (Freon 21)
Perched Aquifer
Concentration (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
Sampling Date
WAC 173-200 criterion = NA

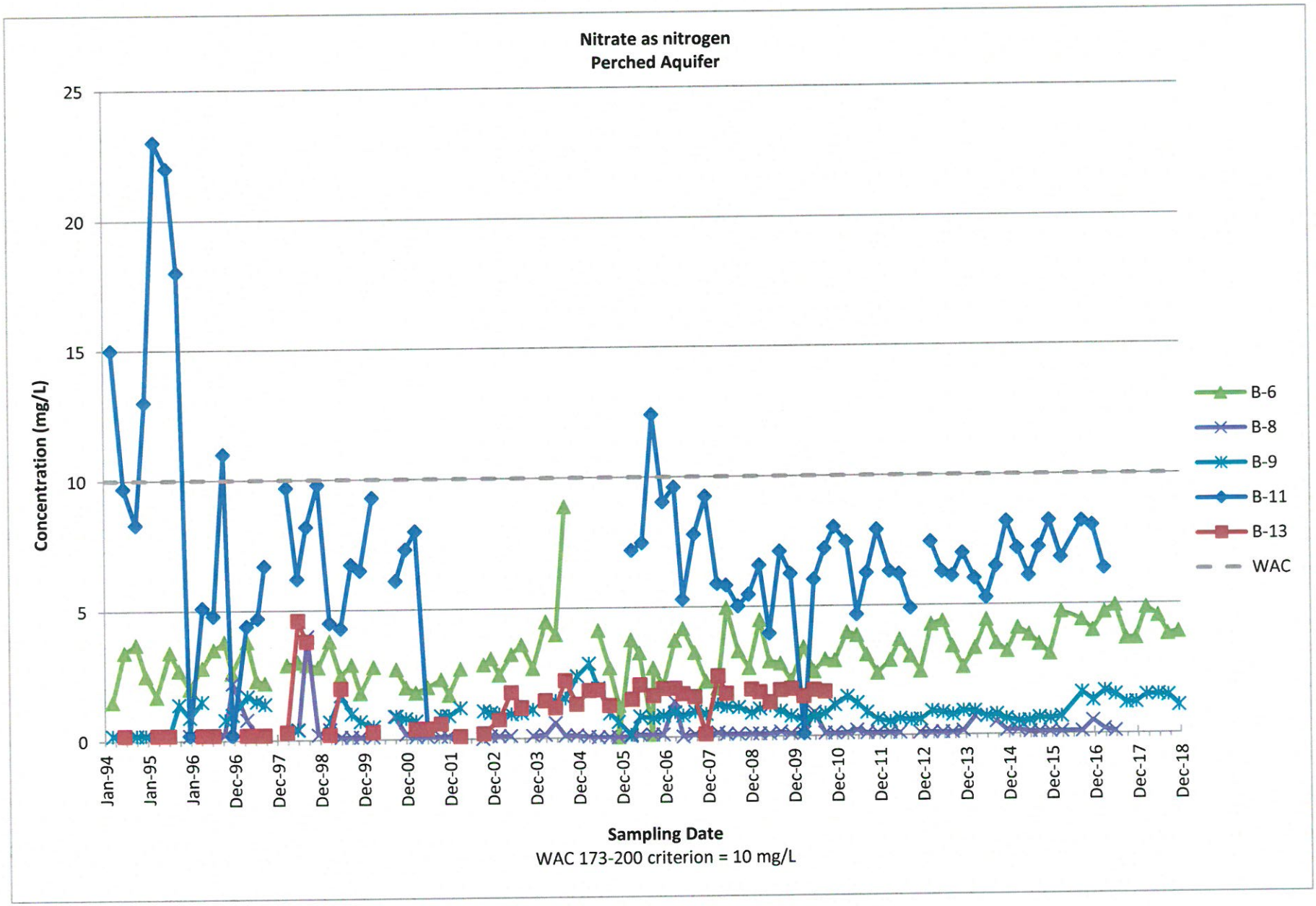

Diethyl ether
Perched Aquifer
Concentration (mg/L)
0
1
2
3
4
5
6
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

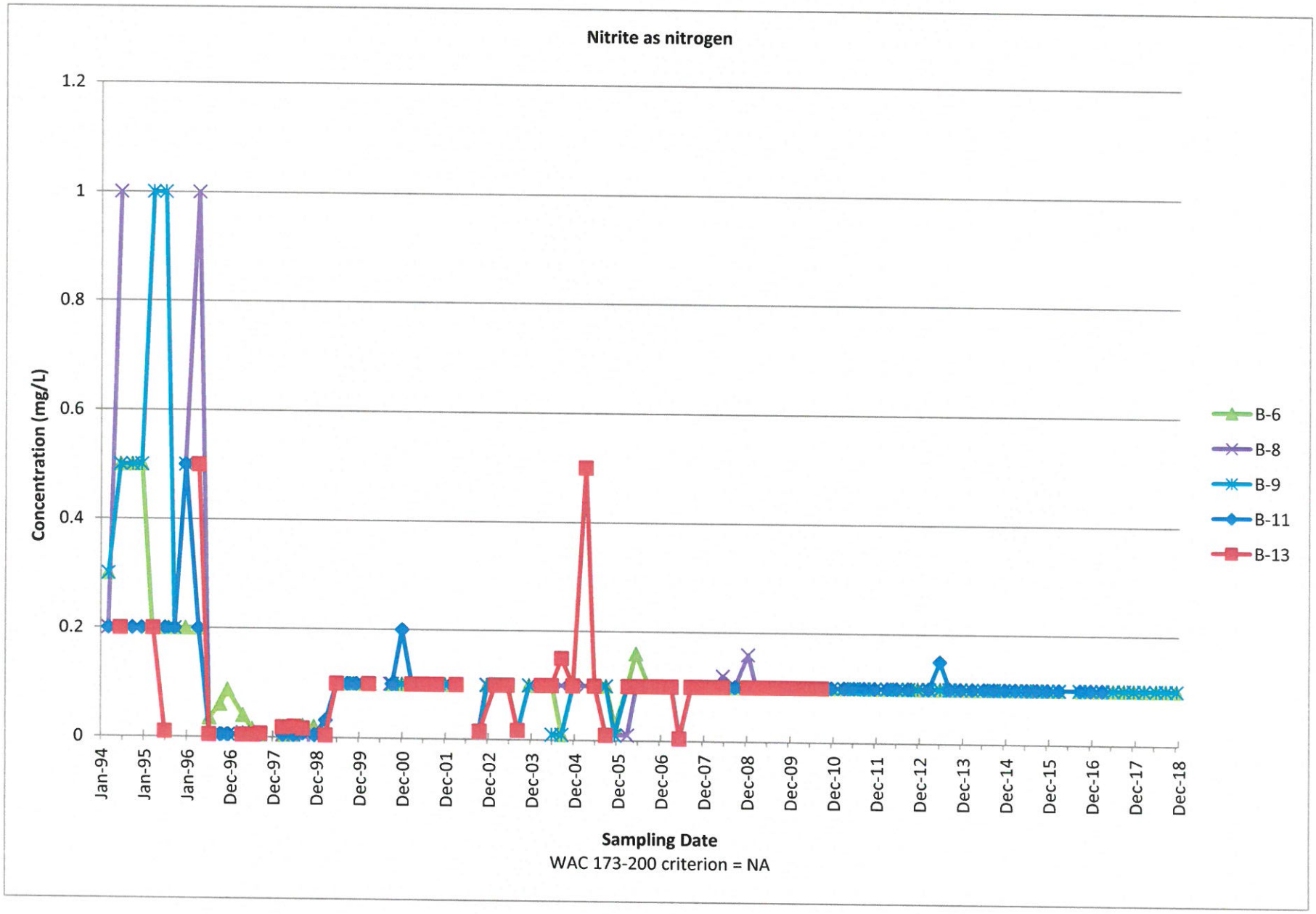

Iron, dissolved
Perched Aquifer
Concentration (mg/L)
25
20
15
10
5
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
WAC
Sampling Date
WAC 173-200 criterion = 0.3 mg/L

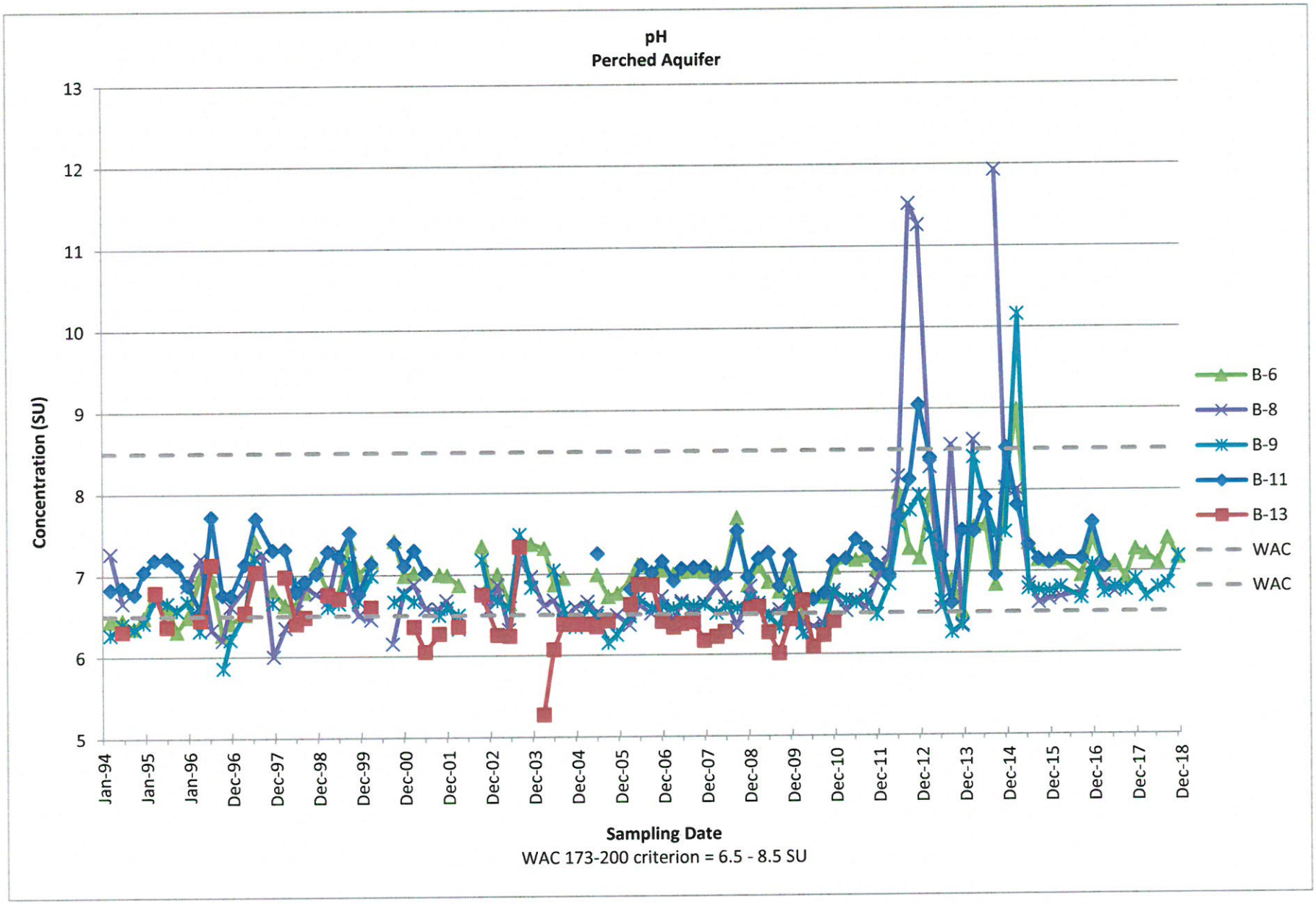

Lead, dissolved
Perched Aquifer
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = 0.05 mg/L
B-6
B-8
B-9
B-11
B-13
WAC

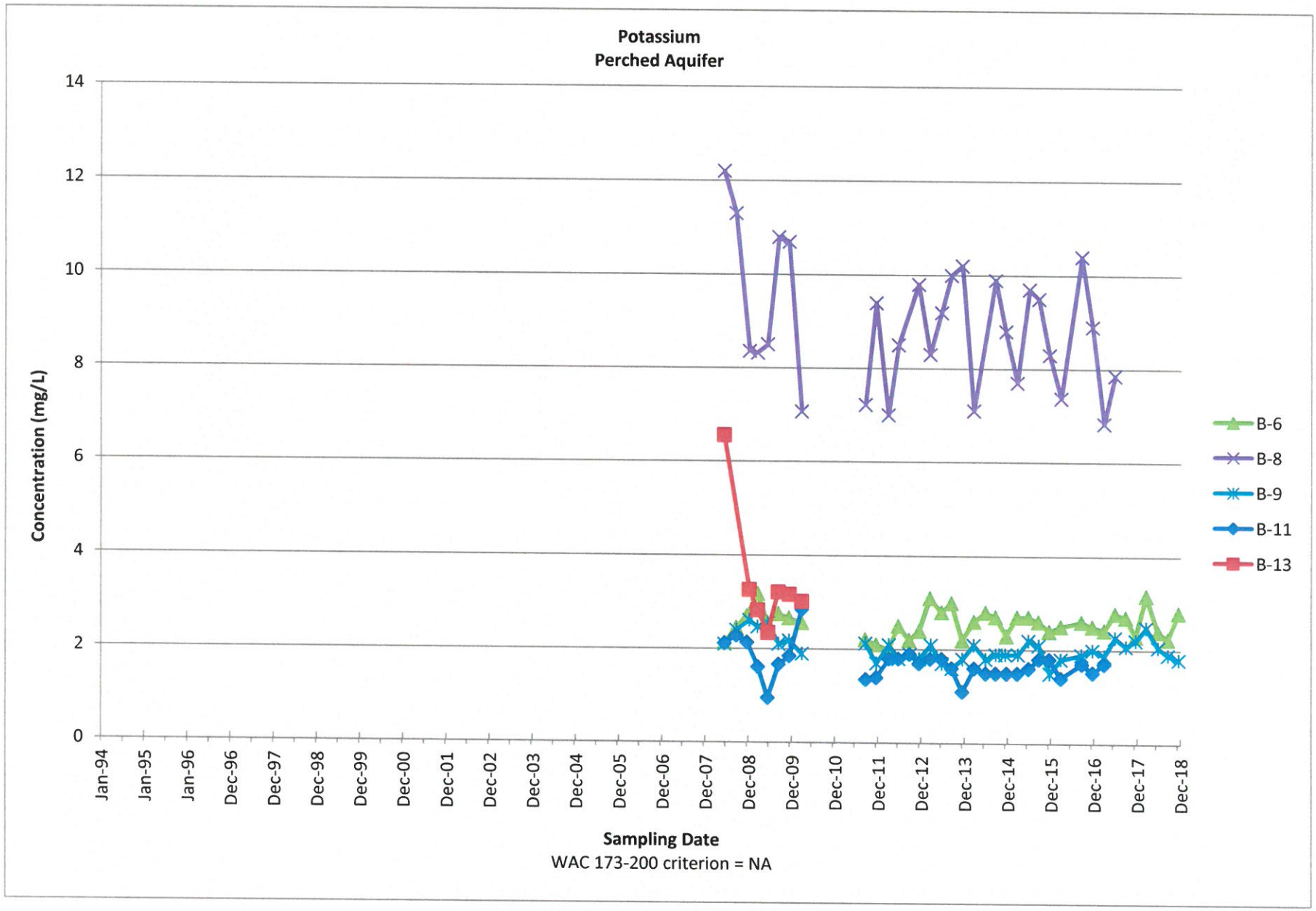

Magesium, dissolved
Perched Aquifer
Concentration (mg/L)
70
60
50
40
30
20
10
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
Sampling Date
WAC 173-200 criterion = NA

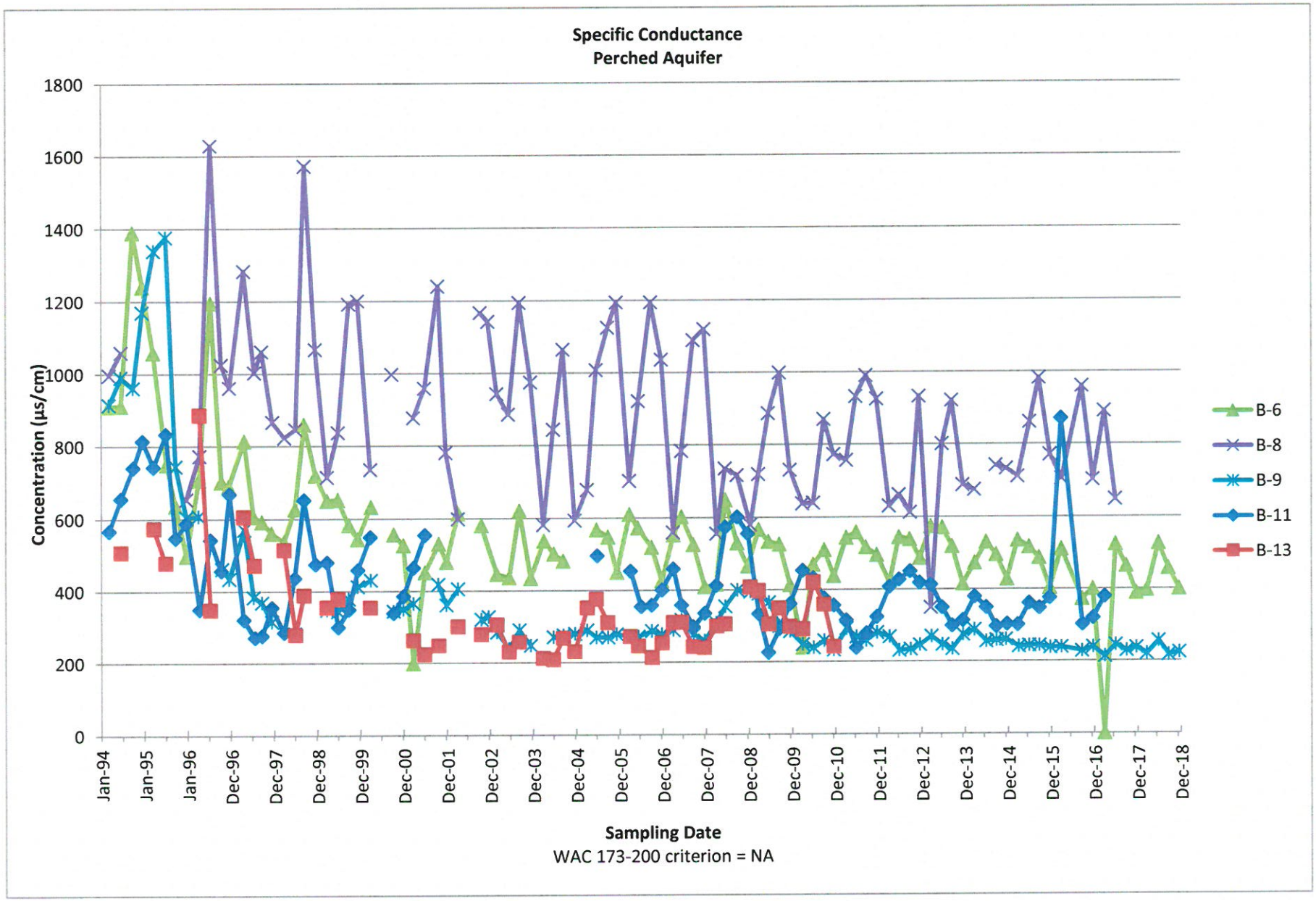

Manganese, dissolved
Perched Aquifer
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
WAC
Sampling Date
WAC 173-200 criterion = 0.05 mg/L

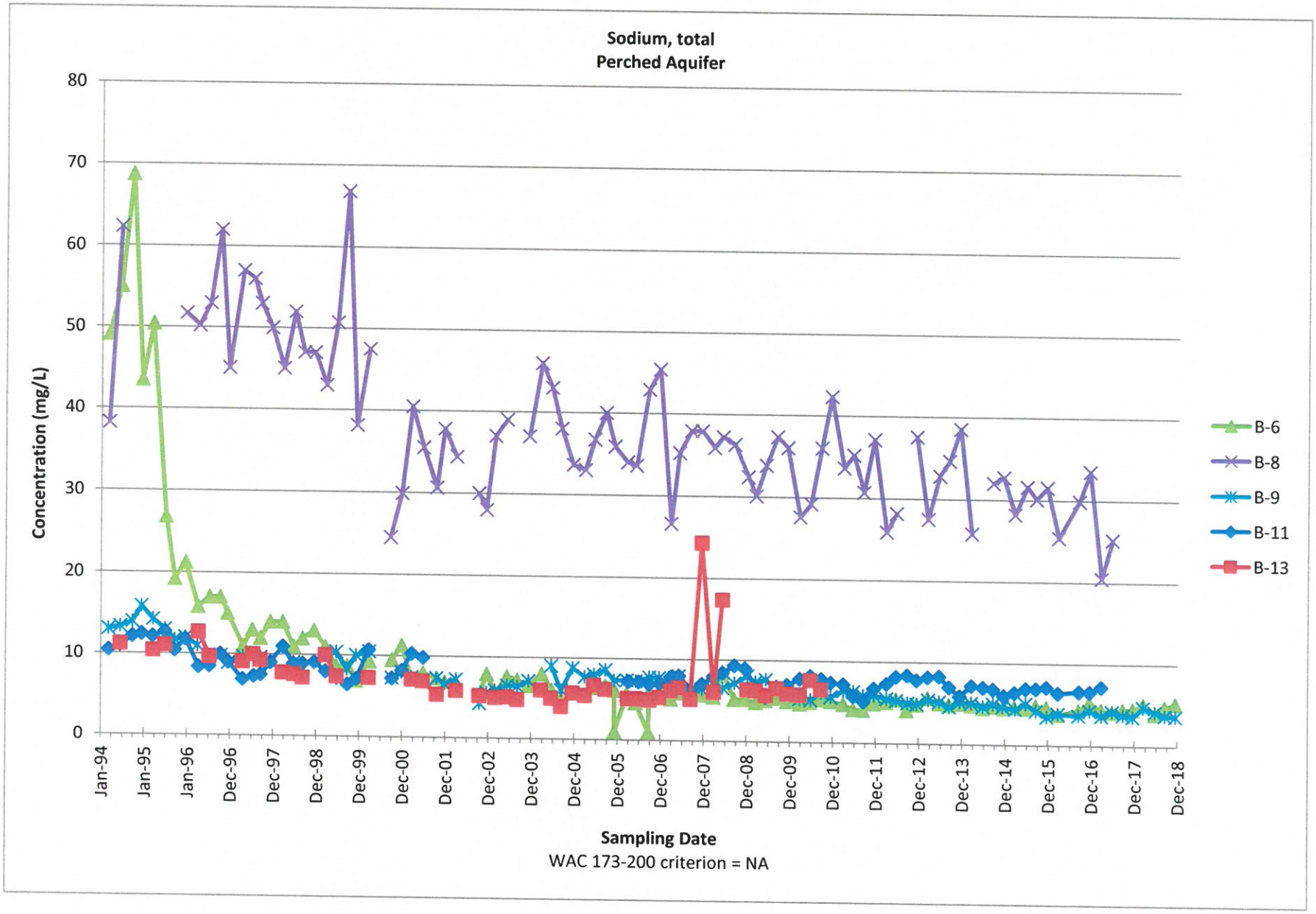

Nitrate as nitrogen
Perched Aquifer
Concentration (mg/L)
25
20
15
10
5
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
WAC
Sampling Date
WAC 173-200 criterion = 10 mg/L

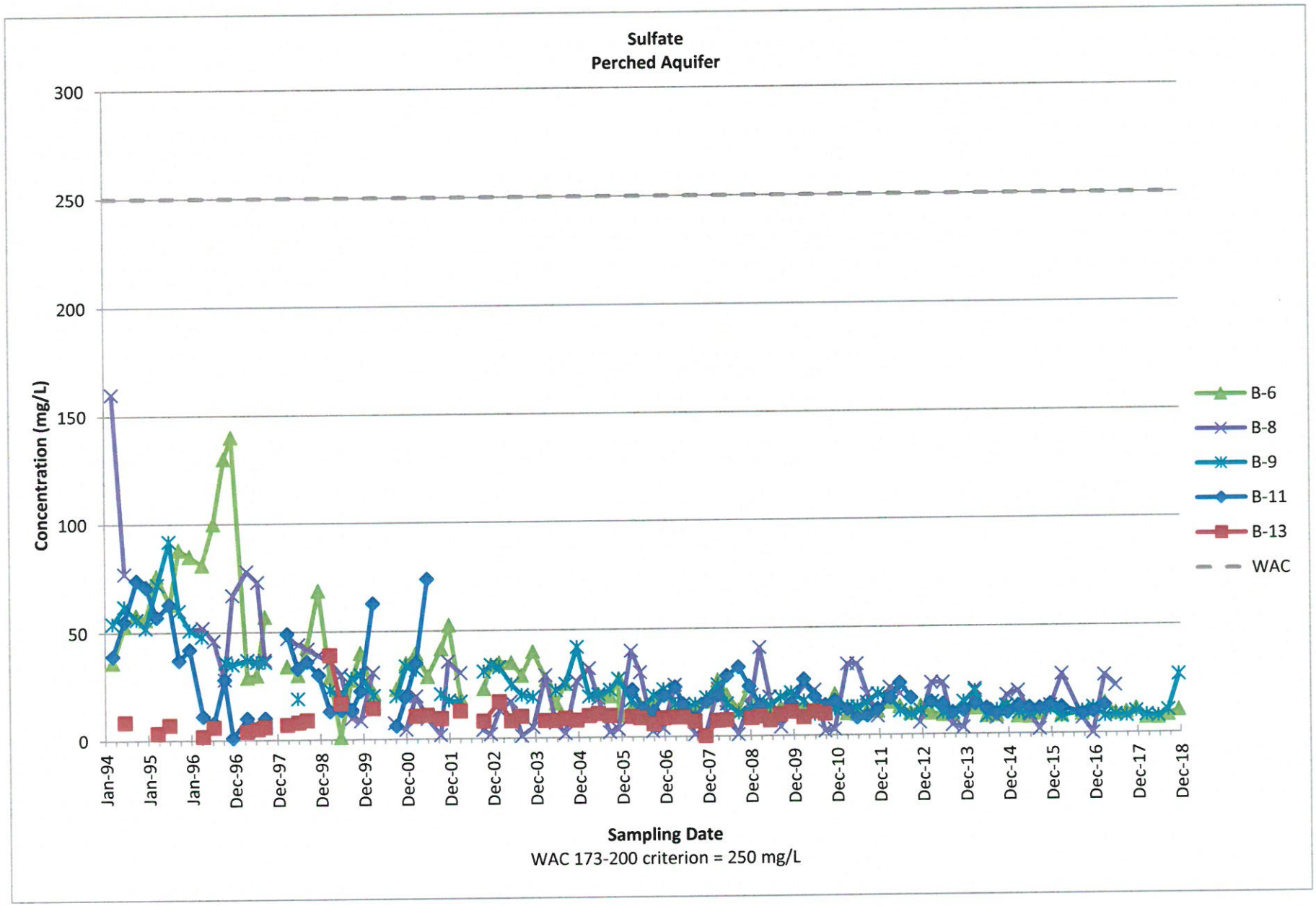

Nitrite as nitrogen
1.2
1
0.8
0.6
0.4
0.2
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

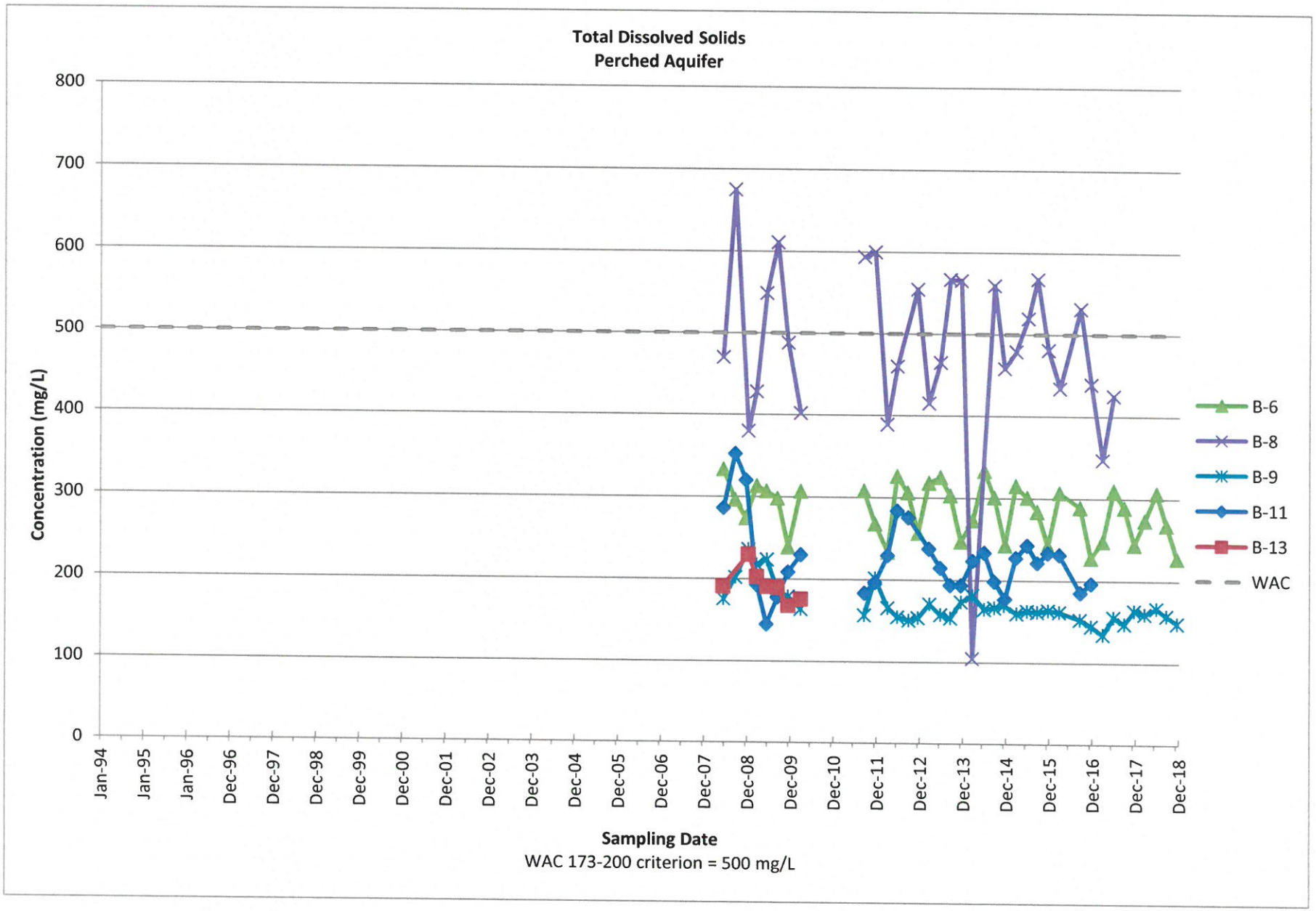

pH
Perched Aquifer
Concentration (SU)
13
12
11
10
9
8
7
6
5
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
WAC
WAC
Sampling Date
WAC 173-200 criterion = 6.5 - 8.5 SU

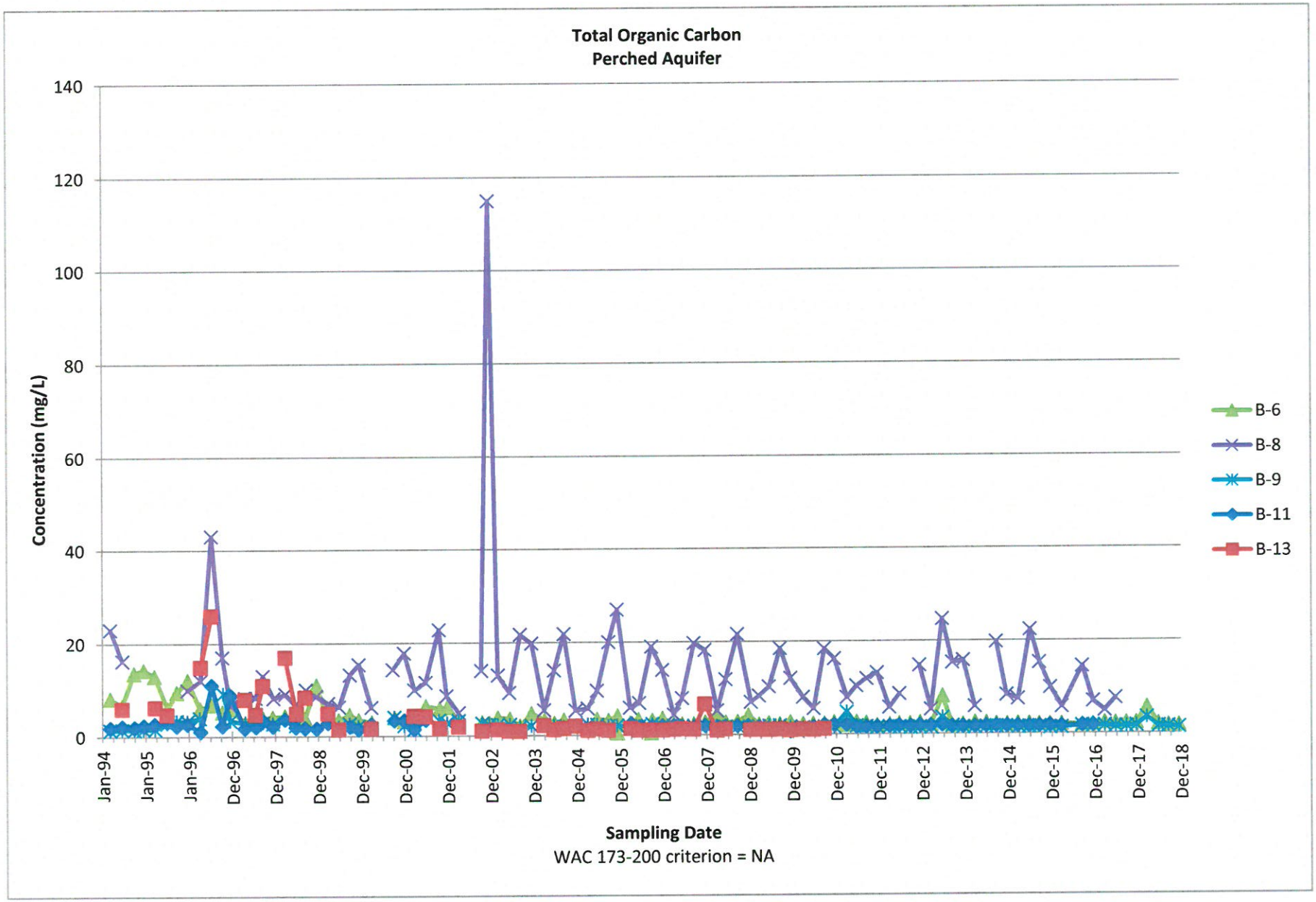

Potassium
Perched Aquifer
Concentration (mg/L)
0
2
4
6
8
10
12
14
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

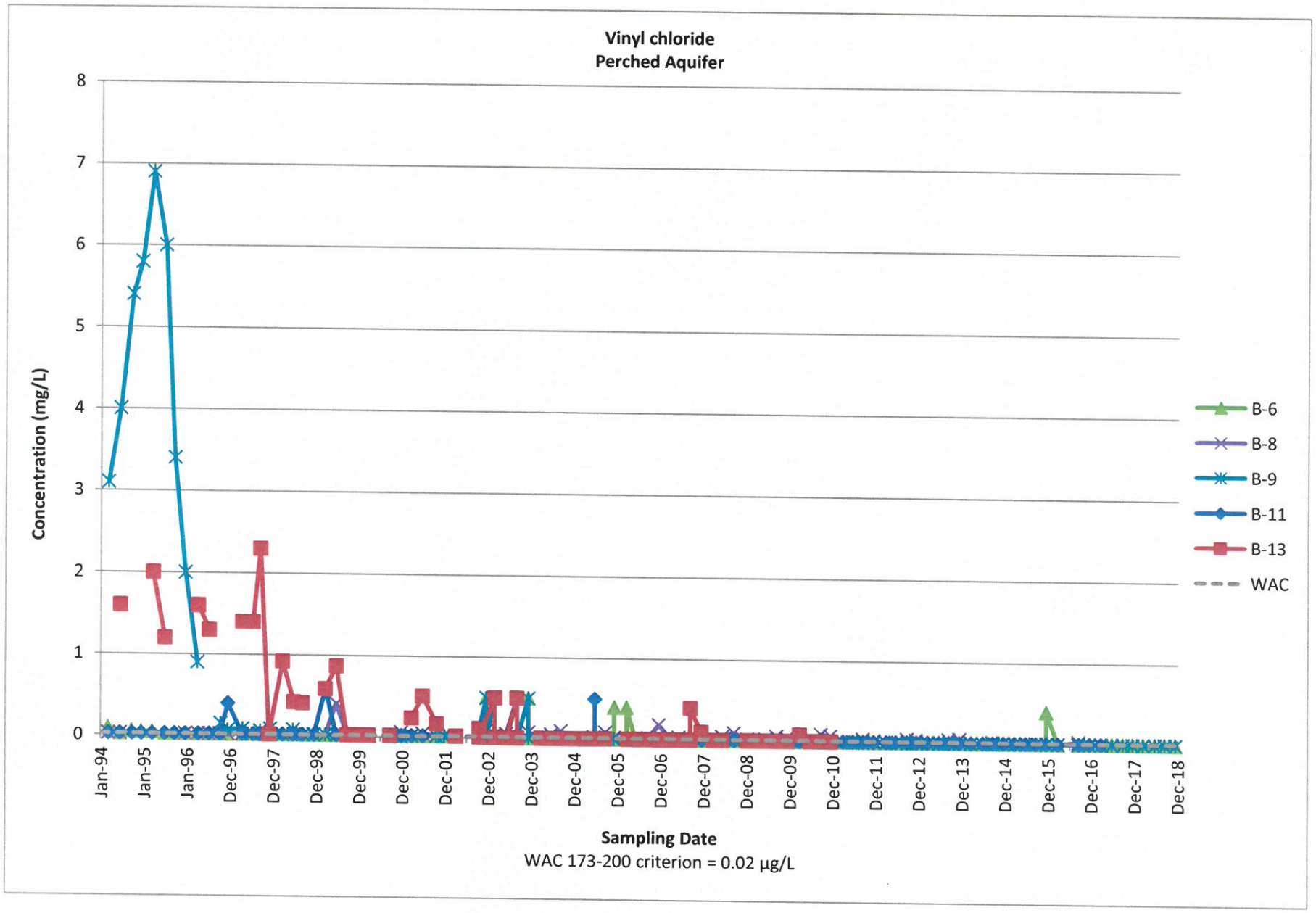

Specific Conductance
Perched Aquifer
Concentration (µs/cm)
1800
1600
1400
1200
1000
800
600
400
200
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-6
B-8
B-9
B-11
B-13

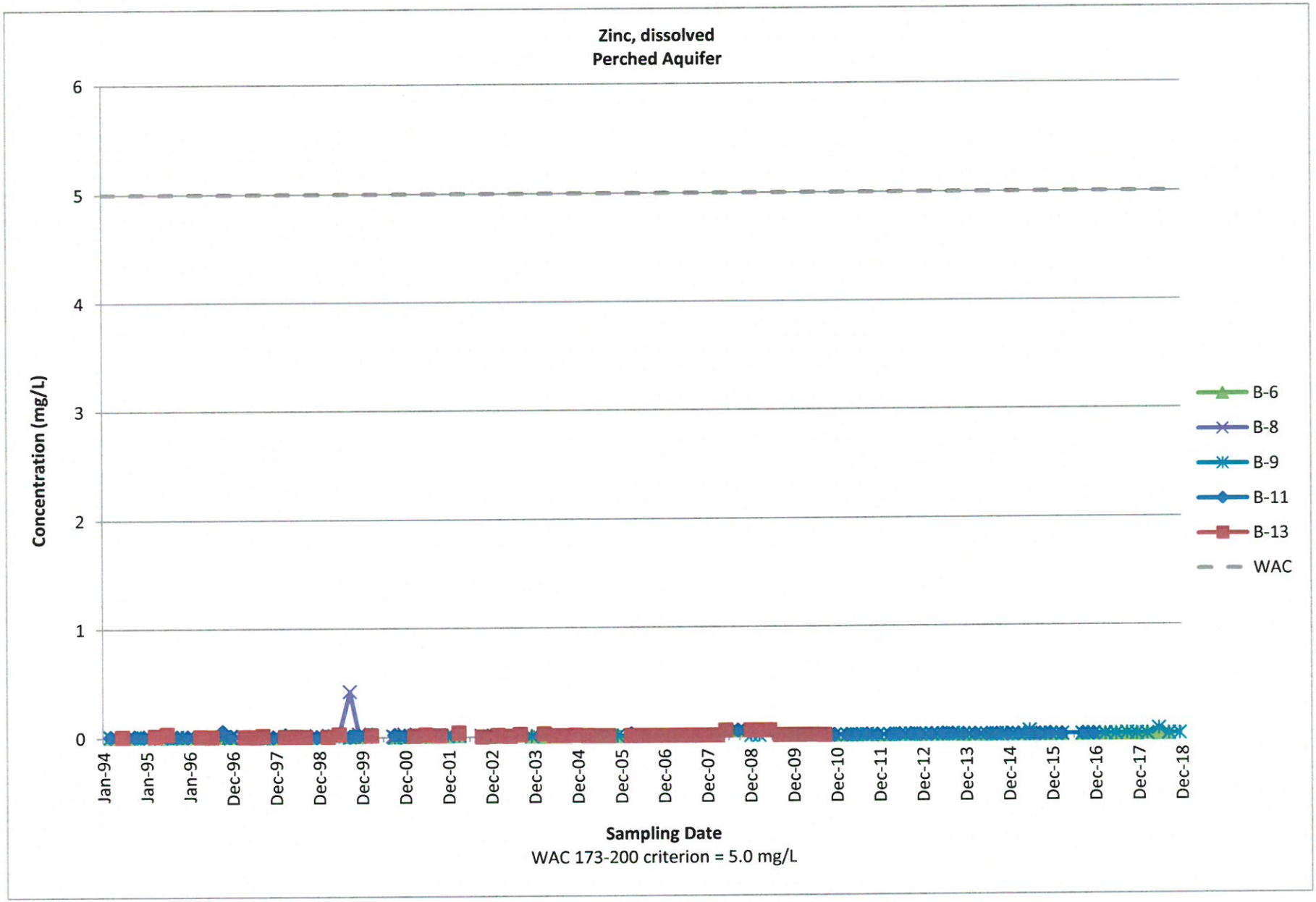

Sodium, total
Perched Aquifer
Concentration (mg/L)
80
70
60
50
40
30
20
10
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
Sampling Date
WAC 173-200 criterion = NA


Sulfate
Perched Aquifer
300
250
200
150
100
50
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = 250 mg/L
B-6
B-8
B-9
B-11
B-13
WAC


Total Dissolved Solids
Perched Aquifer
Concentration (mg/L)
800
700
600
500
400
300
200
100
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-6
B-8
B-9
B-11
B-13
WAC
WAC 173-200 criterion = 500 mg/L


Total Organic Carbon
Perched Aquifer
Concentration (mg/L)
140
120
100
80
60
40
20
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
Sampling Date
WAC 173-200 criterion = NA


Vinyl chloride
Perched Aquifer
Concentration (mg/L)
8
7
6
5
4
3
2
1
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
WAC
Sampling Date
WAC 173-200 criterion = 0.02 µg/L


Zinc, dissolved
Perched Aquifer
Concentration (mg/L)
6
5
4
3
2
1
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-6
B-8
B-9
B-11
B-13
WAC
Sampling Date
WAC 173-200 criterion = 5.0 mg/L

APPENDIX B-1:
2018 Groundwater Monitoring Data – Upper Regional Aquifer

2018 Inorganic Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-1 3/13/2018	B-1 6/20/2018	B-1 9/11/2018	B-1 12/10/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
CONVENTIONALS						
Chemical Oxygen Demand	mg/L		14	20 U	20 U	20 U
Total Organic Carbon	mg/L		7	1.8	1.15	1.44
Total Dissolved Solids †	mg/L	**500	228	235	346	414
Alkalinity †	mg/L		168	161.9	277.2	308.7
Bicarbonate †	mg CaCO3/L		195	161.9	277.2	308.7
Ammonia as nitrogen	mg/L		0.22	0.23	0.26	0.27
Nitrate as nitrogen	mg/L	*10	0.1 U	0.16	0.22	0.32
Nitrite as nitrogen	mg/L		0.1 U	0.1 U	0.1 U	0.1 U
Chloride	mg/L	**250	11.1	10.3	31.1	49.6
Sulfate	mg/L	**250	0.2 U	0.8	3	4.5
pH	SU	**6.5-8.5	7.14	7.31	8.03	8.41
Specific Conductance	µS/cm		810	237	421	566
Temperature	C		10.81	11.01	13.27	10.51
METALS						
Dissolved Antimony †	mg/L		5E-05 J	0.001 U	0.001 U	0.0005 J
Dissolved Arsenic	mg/L	***0.00005	**0.064**	**0.001**	**0.051**	**0.048**
Dissolved Barium †	mg/L	*1.0	0.023	0.016	0.032	0.036
Dissolved Cadmium	mg/L	*0.01	0.001 U	0.00025 U	1.3E-05 J	0.001 U
Dissolved Chromium †	mg/L	*0.05	6E-05 J	0.001	0.001	0.0011
Dissolved Cobalt †	mg/L		0.0003 J	0.001 U	0.0007 J	0.0007
Dissolved Copper †	mg/L	**1.0	0.002 U	0.0017 J	0.0002 J	0.0002 J
Dissolved Iron	mg/L	**0.3	**0.58**	**0.52**	**1.37**	**1.88**
Dissolved Lead	mg/L	*0.05	7E-05 J	0.0005 U	2.6E-05 J	0.001 U
Dissolved Manganese	mg/L	**0.05	**0.775**	0.009	**1.6**	**2.05**
Dissolved Mercury	mg/L	*0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dissolved Nickel †	mg/L		0.001	0.001	0.002	0.0029
Dissolved Selenium †	mg/L	*0.01	0.0002 J	0.002	0.0005 J	0.0006 J
Dissolved Vanadium †	mg/L		0.0015	0.002	0.003	0.0016
Dissolved Zinc	mg/L	**5.0	0.0003 J	0.0015 J	0.0007 J	0.0025 U
Total Calcium	mg/L		45.8	51.8	46.2	69.8
Total Magnesium †	mg/L		31.2	37.1	31.8	47.4
Total Potassium †	mg/L		4.85	3.76	4.53	5.6
Total Sodium	mg/L		22.1	19.9	18	16.9

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen

Units:

mg/L = milligrams per liter
µg/L = micrograms per liter
SU = standard units
µS/cm = microsiemens per centimeter
C = degrees centigrade
mg CaCO3/L = milligrams of calcium carbonate per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.
NT — Not tested.

Results shown in bold exceed Ground Water Quality Criteria.
† Indicates supplement analytes measured due to Ecology request

2018 Inorganic Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-2 3/12/2018	B-2 6/20/2018	B-2 9/6/2018	B-2 12/4/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
CONVENTIONALS						
Chemical Oxygen Demand	mg/L		8 U	20 U	20 U	20 U
Total Organic Carbon	mg/L		4.31	0.83	0.78	0.84
Total Dissolved Solids †	mg/L	**500	225	227	229	256
Alkalinity †	mg/L		127	121.7	130.3	132
Bicarbonate †	mg CaCO3/L		127	121.7	130.3	145.2
Ammonia as nitrogen	mg/L		0.01 U	0.01 U	0.01 U	0.01 U
Nitrate as nitrogen	mg/L	*10	1.83	1.67	1.98	2.56
Nitrite as nitrogen	mg/L		0.1 U	0.1 U	0.1 U	0.01 U
Chloride	mg/L	**250	5.8	2.8	4.9	15.8
Sulfate	mg/L	**250	26.6	28.5	29	30.1
pH	SU	**6.5-8.5	7.1	6.85	**6.41**	**5.66**
Specific Conductance	µS/cm		328	351	349	435
Temperature	C		11.08	11.34	11.63	10.68
METALS						
Dissolved Antimony †	mg/L		9E-05 J	0.001 U	0.001 U	0.001 U
Dissolved Arsenic	mg/L	***0.00005	**0.0009 J**	**0.0008**	**0.0008**	**0.00097**
Dissolved Barium †	mg/L	*1.0	0.03	0.029	0.03	0.037
Dissolved Cadmium	mg/L	*0.01	3E-05 J	0.00025 U	1E-05 J	0.001 U
Dissolved Chromium †	mg/L	*0.05	0.0008 J	0.001	0.002	0.0009 J
Dissolved Cobalt †	mg/L		5E-05 J	0.001 U	9E-05 J	0.001 U
Dissolved Copper †	mg/L	**1.0	0.0007 J	0.0005 J	0.0005 J	0.0006 J
Dissolved Iron	mg/L	**0.3	0.05 U	0.05 U	0.05 U	0.05 U
Dissolved Lead	mg/L	*0.05	0.001 U	0.0005 U	0.0005 U	0.0005 U
Dissolved Manganese	mg/L	**0.05	0.0007 J	0.0009 J	0.0004 J	0.00021 J
Dissolved Mercury	mg/L	*0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dissolved Nickel †	mg/L		0.002	0.001	0.002	0.0013
Dissolved Selenium †	mg/L	*0.01	0.004	0.002	0.001	0.0023
Dissolved Vanadium †	mg/L		0.0015	0.002	0.002	0.0016
Dissolved Zinc	mg/L	**5.0	0.001 J	0.0025 U	0.0008 J	0.0008 J
Total Calcium	mg/L		31.7	26.4	29.3	32.7
Total Magnesium †	mg/L		12.6	11.4	11.8	13
Total Potassium †	mg/L		35.8	22.4	29.2	30.8
Total Sodium	mg/L		11.5	7.87	8.49	10.5

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen

Units:

mg/L = milligrams per liter
µg/L = micrograms per liter
SU = standard units
µS/cm = microsiemens per centimeter
C = degrees centigrade
mg CaCO3/L = milligrams of calcium carbonate per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.
NT — Not tested.

Results shown in bold exceed Ground Water Quality Criteria.
† Indicates supplement analytes measured due to Ecology request

2018 Inorganic Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-3 3/12/2018	B-3 6/19/2018	B-3 9/10/2018	B-3 12/5/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
CONVENTIONALS						
Chemical Oxygen Demand	mg/L		22	20 U	20 U	20 U
Total Organic Carbon	mg/L		13.22	2.36	1.15	2.2
Total Dissolved Solids †	mg/L	**500	348	216	157	201
Alkalinity †	mg/L		235	153.9	104.3	133
Bicarbonate †	mg CaCO3/L		235	153.9	104.3	151.3
Ammonia as nitrogen	mg/L		1.76	1.19	0.85	0.99
Nitrate as nitrogen	mg/L	*10	0.65	0.19	0.11	0.01 U
Nitrite as nitrogen	mg/L		0.1 U	0.1 U	0.1 U	0.01
Chloride	mg/L	**250	37.1	7.9	3.9	12
Sulfate	mg/L	**250	0.2	10 U	0.2 U	0.2 U
pH	SU	**6.5-8.5	6.94	7.06	7.9	**8.93**
Specific Conductance	µS/cm		391	240	218	335
Temperature	C		13.54	13.86	13.75	13.47
METALS						
Dissolved Antimony †	mg/L		0.005 U	0.001	0.001 U	0.001 U
Dissolved Arsenic	mg/L	***0.00005	**0.004**	**0.0026**	**0.002**	**0.0023**
Dissolved Barium †	mg/L	*1.0	0.192	0.063	0.058	0.094
Dissolved Cadmium	mg/L	*0.01	0.001 U	0.001 U	0.001 U	0.001 U
Dissolved Chromium †	mg/L	*0.05	0.0003 J	0.001 U	0.0008 J	0.0005 J
Dissolved Cobalt †	mg/L		0.0005 J	0.0002 J	0.0001 J	0.0002 J
Dissolved Copper †	mg/L	**1.0	0.02 U	0.0005 J	0.0001 J	0.0001 J
Dissolved Iron	mg/L	**0.3	**12.5**	**3.11**	**3.25**	**5.31**
Dissolved Lead	mg/L	*0.05	0.001 U	0.0005 U	0.001 U	0.001 U
Dissolved Manganese	mg/L	**0.05	**0.876**	**0.4**	**0.379**	**0.62**
Dissolved Mercury	mg/L	*0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dissolved Nickel †	mg/L		0.002	0.0008 J	0.0002 J	0.0008 J
Dissolved Selenium †	mg/L	*0.01	0.0004 J	0.001 U	0.001 U	0.0003 J
Dissolved Vanadium †	mg/L		0.0006 J	0.0008 J	0.0005 J	0.0007 J
Dissolved Zinc	mg/L	**5.0	0.0005 J	0.0015 J	0.0025 U	0.0025 U
Total Calcium	mg/L		51.1	14.1	17.8	26
Total Magnesium †	mg/L		33.7	9.88	11.8	17.3
Total Potassium †	mg/L		8.51	4.51	4.23	5.41
Total Sodium	mg/L		23.4	28.4	9.1	15.4

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen

Units:

mg/L = milligrams per liter
µg/L = micrograms per liter
SU = standard units
µS/cm = microsiemens per centimeter
C = degrees centigrade
mg CaCO3/L = milligrams of calcium carbonate per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.
NT — Not tested.

Results shown in bold exceed Ground Water Quality Criteria.
† Indicates supplement analytes measured due to Ecology request

2018 Inorganic Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-4 3/13/2018	B-4 6/21/2018	B-4 9/12/2018	B-4 12/12/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
CONVENTIONALS						
Chemical Oxygen Demand	mg/L		18	20 U	23	20 U
Total Organic Carbon	mg/L		19.3	1.67	1.68	1.58
Total Dissolved Solids †	mg/L	**500	**656**	**697**	**685**	**621**
Alkalinity †	mg/L		343	362.7	359.1	193.9
Bicarbonate †	mg CaCO3/L		375	362.7	359.1	193.9
Ammonia as nitrogen	mg/L		1.11	1.08	0.75	1
Nitrate as nitrogen	mg/L	*10	0.1 U	0.44	0.48	0.18
Nitrite as nitrogen	mg/L		0.1 U	0.1 U	0.1 U	0.1 U
Chloride	mg/L	**250	133.1	127	118	124
Sulfate	mg/L	**250	56.5	55.3	55.6	59
pH	SU	**6.5-8.5	6.81	6.75	7.42	8.36
Specific Conductance	µS/cm		1343	1284	1078	1172
Temperature	C		10.17	10.44	11.17	10.12
METALS						
Dissolved Antimony †	mg/L		0.001 U	0.001 U	0.001 U	0.0004 J
Dissolved Arsenic	mg/L	***0.00005	**0.003**	**0.0025**	**0.003**	**0.046**
Dissolved Barium †	mg/L	*1.0	0.118	0.112	0.102	0.036
Dissolved Cadmium	mg/L	*0.01	0.001 U	0.001 U	0.00025 U	0.001 U
Dissolved Chromium †	mg/L	*0.05	0.0005 J	0.0022	0.001	0.001
Dissolved Cobalt †	mg/L		0.0002 J	0.00021	0.0003 J	0.0007 J
Dissolved Copper †	mg/L	**1.0	0.0005 J	0.0005	0.0002 J	0.0003 J
Dissolved Iron	mg/L	**0.3	**6.33**	**6.1**	**5.06**	**6.49**
Dissolved Lead	mg/L	*0.05	3E-05 J	0.001 U	0.0005 U	0.001 U
Dissolved Manganese	mg/L	**0.05	**1.68**	**1.67**	**1.49**	**1.5**
Dissolved Mercury	mg/L	*0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dissolved Nickel †	mg/L		0.001	0.001 U	0.001	0.003
Dissolved Selenium †	mg/L	*0.01	0.001	0.0014	0.001	0.0005 J
Dissolved Vanadium †	mg/L		0.0002 J	0.00093	0.0005 J	0.002
Dissolved Zinc	mg/L	**5.0	0.00096 J	0.05 U	0.001 J	0.0025 U
Total Calcium	mg/L		106	88.9	81.8	98.1
Total Magnesium †	mg/L		88.2	76.6	67.9	83
Total Potassium †	mg/L		8.68	7.9	6.41	7.11
Total Sodium	mg/L		25.4	20.7	21.6	20

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen

Units:

mg/L = milligrams per liter
µg/L = micrograms per liter
SU = standard units
µS/cm = microsiemens per centimeter
C = degrees centigrade
mg CaCO3/L = milligrams of calcium carbonate per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.
NT — Not tested.

Results shown in bold exceed Ground Water Quality Criteria.
† Indicates supplement analytes measured due to Ecology request

2018 Inorganic Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-5 3/15/2018	B-5 6/21/2018	B-5 9/11/2018	B-5 12/13/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
CONVENTIONALS						
Chemical Oxygen Demand	mg/L		32	28	39	35
Total Organic Carbon	mg/L		13.2	7.11	7.76	9.91
Total Dissolved Solids †	mg/L	**500	470	372	**526**	425
Alkalinity †	mg/L		253	212.2	312.2	290.1
Bicarbonate †	mg CaCO3/L		295.7	212.2	312.2	290.1
Ammonia as nitrogen	mg/L		1.11	1.38	1.12	1.81
Nitrate as nitrogen	mg/L	*10	0.9	0.4	1.01	0.97
Nitrite as nitrogen	mg/L		0.1 U	0.1 U	0.1 U	0.1 U
Chloride	mg/L	**250	84.9	62.7	90.5	85
Sulfate	mg/L	**250	0.5	0.3	0.3	0.4
pH	SU	**6.5-8.5	6.71	7.12	7.41	6.57
Specific Conductance	µS/cm		775	788	901	927
Temperature	C		11.34	11.42	11.5	11.2
METALS						
Dissolved Antimony †	mg/L		0.0002 J	0.001 U	0.001 U	0.005 U
Dissolved Arsenic	mg/L	***0.00005	**0.001**	**0.0036**	**0.004**	**0.0009 J**
Dissolved Barium †	mg/L	*1.0	0.079	0.073	0.112	0.055
Dissolved Cadmium	mg/L	*0.01	3E-05 J	0.001 U	1E-05 J	0.001 U
Dissolved Chromium †	mg/L	*0.05	0.0004 J	0.0022	0.002	0.0003 J
Dissolved Cobalt †	mg/L		0.0009 J	0.0008	0.0009 J	0.0006 J
Dissolved Copper †	mg/L	**1.0	0.0003 J	0.0002	0.0002 J	0.0003 J
Dissolved Iron	mg/L	**0.3	**5.51**	**19.6**	**17**	**0.08**
Dissolved Lead	mg/L	*0.05	0.0001 J	0.001 U	0.001 U	0.001 U
Dissolved Manganese	mg/L	**0.05	**2.11**	**1.67**	**2.54**	**1.44**
Dissolved Mercury	mg/L	*0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dissolved Nickel †	mg/L		0.006	0.0046	0.006	0.0053
Dissolved Selenium †	mg/L	*0.01	0.001	0.0014	0.002	0.0016
Dissolved Vanadium †	mg/L		0.0002 J	0.0012	0.001	8E-05 J
Dissolved Zinc	mg/L	**5.0	0.003	0.001	0.0007 J	0.0008 J
Total Calcium	mg/L		56.1	41.8	62.8	47
Total Magnesium †	mg/L		6.04	36	52.6	39.6
Total Potassium †	mg/L		41.2	5.77	6.28	5.77
Total Sodium	mg/L		43.2	0.5 U	40.4	46.7

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen

Units:

mg/L = milligrams per liter
µg/L = micrograms per liter
SU = standard units
µS/cm = microsiemens per centimeter
C = degrees centigrade
mg CaCO3/L = milligrams of calcium carbonate per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.
NT — Not tested.

Results shown in bold exceed Ground Water Quality Criteria.
† Indicates supplement analytes measured due to Ecology request

2018 Inorganic Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-10 1Q - 2018	B-10 6/26/2018	B-10 9/18/2018	B-10 12/13/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
CONVENTIONALS						
Chemical Oxygen Demand	mg/L		NT	20 U	20 U	20 U
Total Organic Carbon	mg/L		NT	0.7	0.78	0.78
Total Dissolved Solids †	mg/L	**500	NT	208	205	204
Alkalinity †	mg/L		NT	134.8	150.7	145.3
Bicarbonate †	mg CaCO3/L		NT	134.8	150.7	145.3
Ammonia as nitrogen	mg/L		NT	0.25	0.43	0.41
Nitrate as nitrogen	mg/L	*10	NT	0.13	0.01 U	0.2
Nitrite as nitrogen	mg/L		NT	0.1 U	0.01 U	0.1 U
Chloride	mg/L	**250	NT	4.1	4	4.2
Sulfate	mg/L	**250	NT	25.5	20.9	23
pH	SU	**6.5-8.5	NT	7.27	8.22	8.47
Specific Conductance	µS/cm		NT	390	329	327
Temperature	C		NT	10.82	10.2	10.11
METALS						
Dissolved Antimony †	mg/L		NT	0.005 U	0.001 U	0.005 U
Dissolved Arsenic	mg/L	***0.00005	NT	**0.002**	**0.002**	**0.0018**
Dissolved Barium †	mg/L	*1.0	NT	0.042	0.045	0.042
Dissolved Cadmium	mg/L	*0.01	NT	0.001 U	0.001 U	0.001 U
Dissolved Chromium †	mg/L	*0.05	NT	0.01 U	0.0003	0.0003 J
Dissolved Cobalt †	mg/L		NT	0.001 U	4E-05 J	5E-05 J
Dissolved Copper †	mg/L	**1.0	NT	0.0002 J	0.002 U	0.02 U
Dissolved Iron	mg/L	**0.3	NT	**1.7**	**1.55**	**1.62**
Dissolved Lead	mg/L	*0.05	NT	0.001 U	0.0005 U	0.001 U
Dissolved Manganese	mg/L	**0.05	NT	**0.387**	**0.436**	**0.411**
Dissolved Mercury	mg/L	*0.002	NT	0.0002 U	0.0002 U	0.0002 U
Dissolved Nickel †	mg/L		NT	0.001 U	0.0001 J	0.0001 J
Dissolved Selenium †	mg/L	*0.01	NT	0.005 U	0.001 U	0.005 U
Dissolved Vanadium †	mg/L		NT	0.0005 J	0.0003	0.0002 J
Dissolved Zinc	mg/L	**5.0	NT	0.05 U	0.0025 U	0.05 U
Total Calcium	mg/L		NT	28.1	26.3	28.8
Total Magnesium †	mg/L		NT	20.9	19	20.3
Total Potassium †	mg/L		NT	3.34	3.75	3.79
Total Sodium	mg/L		NT	8.68	9.4	9.01

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen

Units:

mg/L = milligrams per liter
µg/L = micrograms per liter
SU = standard units
µS/cm = microsiemens per centimeter
C = degrees centigrade
mg CaCO3/L = milligrams of calcium carbonate per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.
NT — Not tested.

Results shown in bold exceed Ground Water Quality Criteria.
† Indicates supplement analytes measured due to Ecology request

2018 Inorganic Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-12 3/12/2018	B-12 6/19/2018	B-12 9/10/2018	B-12 12/5/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
CONVENTIONALS						
Chemical Oxygen Demand	mg/L		8 U	20 U	20 U	20 U
Total Organic Carbon	mg/L		3.4	0.54	0.39	0.31
Total Dissolved Solids †	mg/L	**500	210	216	214	201
Alkalinity †	mg/L		146	148	155.6	153
Bicarbonate †	mg CaCO3/L		146	148	155.6	168.3
Ammonia as nitrogen	mg/L		0.09	0.36	0.24	0.16
Nitrate as nitrogen	mg/L	*10	0.1 U	0.16	0.13	0.01 U
Nitrite as nitrogen	mg/L		0.1 U	0.1 U	0.1 U	0.01 U
Chloride	mg/L	**250	3.5	3.6	3.4	3.6
Sulfate	mg/L	**250	14.3	13.3	13.5	13
pH	SU	**6.5-8.5	7.30	7.51	8.00	7.30
Specific Conductance	µS/cm		310	265	325	344
Temperature	C		11.8	12.36	11.91	11.8
METALS						
Dissolved Antimony †	mg/L		8E-05 J	0.001 U	0.001 U	0.001 U
Dissolved Arsenic	mg/L	***0.00005	**0.005**	**0.0046**	**0.0005 J**	**0.0042**
Dissolved Barium †	mg/L	*1.0	0.03	0.032	0.03	0.031
Dissolved Cadmium	mg/L	*0.01	0.001 U	0.001 U	0.001 U	0.001 U
Dissolved Chromium †	mg/L	*0.05	0.01 U	0.001 U	0.001	0.001 U
Dissolved Cobalt †	mg/L		5E-05 J	0.001 U	0.0001 J	0.001 U
Dissolved Copper †	mg/L	**1.0	0.0004 J	0.0003 J	0.0003 J	0.0001 J
Dissolved Iron	mg/L	**0.3	**0.64**	**0.46**	**0.51**	**0.58**
Dissolved Lead	mg/L	*0.05	0.001 U	0.0005 U	0.001 U	0.001 U
Dissolved Manganese	mg/L	**0.05	**0.057**	**0.1**	**0.071**	**0.077**
Dissolved Mercury	mg/L	*0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Dissolved Nickel †	mg/L		0.0001 J	0.0005 J	0.0001 J	0.0004 J
Dissolved Selenium †	mg/L	*0.01	0.005 U	0.001 U	0.001 U	0.001 U
Dissolved Vanadium †	mg/L		0.0005 J	0.0008 J	0.001	0.0012
Dissolved Zinc	mg/L	**5.0	0.0004 J	0.0025 U	0.0025 U	0.0025 U
Total Calcium	mg/L		25.8	16.7	23	23.4
Total Magnesium †	mg/L		24.3	15.7	21.8	22.2
Total Potassium †	mg/L		4.95	3.07	4	4.3
Total Sodium	mg/L		13.2	9.88	11.4	12.6

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen

Units:

mg/L = milligrams per liter
µg/L = micrograms per liter
SU = standard units
µS/cm = microsiemens per centimeter
C = degrees centigrade
mg CaCO3/L = milligrams of calcium carbonate per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.
NT — Not tested.

Results shown in bold exceed Ground Water Quality Criteria.
† Indicates supplement analytes measured due to Ecology request

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-1 3/13/2018	B-1 6/20/2018	B-1 9/11/2018	B-1 12/10/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
1,1,1,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,1-trichloroethane	µg/L	200*	0.4 U	0.4 U	0.4 U	0.4 U
1,1,2,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichlorofluorotoluene (Freon-113)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethane	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethene	µg/L	7****	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2****	1 U	1 U	1 U	1 U
1,2-dibromoethane (EDB)	µg/L	0.001***	0.01 U	0.01 U	0.01 U	0.01 U
1,2-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloroethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloropropane	µg/L	0.6***	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,3-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,4-dichlorobenzene	µg/L	4***	0.4 U	0.4 U	0.4 U	0.4 U
1,4-dioxane	µg/L	7***	5 U	5 U	5 U	5 U
2,2-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-butanone	µg/L		3 U	3 U	3 U	3 U
2-chloroethyl vinyl ether	µg/L		2 U	2 U	2 U	2 U
2-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-nitropropane	µg/L		10 U	10 U	10 U	10 U
2-phenylbutane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-methyl-2-pentanone	µg/L		4 U	4 U	4 U	4 U
Acetone	µg/L		3 U	3 U	3 U	3 U
Acrolein	µg/L		4 U	4 U	4 U	4 U
Acrylonitrile	µg/L	0.07***	0.05 U	0.05 U	0.05 U	0.05 U
Allyl chloride	µg/L		2 U	2 U	2 U	2 U
Benzene	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Bromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon disulfide	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon tetrachloride	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chlorodibromomethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorodifluoromethane (Freon-22)	µg/L		0.4	1	0.4 U	0.7
Chloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroform	µg/L	7.0***	0.4 U	0.4 U	0.4 U	0.4 U
Chloromethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
cis-1,2-dichloroethene	µg/L	70****	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Cymene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dibromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichlorodifluoromethane (CFC-12)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichloromethane	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Dichloromonofluoromethane (Freon-21)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Diethyl ether	µg/L		0.4 U	0.4 U	0.4 U	0.4 U

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-1 3/13/2018	B-1 6/20/2018	B-1 9/11/2018	B-1 12/10/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
Ethyl methacrylate	µg/L		3 U	3 U	3 U	3 U
Ethylbenzene	µg/L	700****	0.4 U	0.4 U	0.4 U	0.4 U
Hexachloro-1,3-butadiene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Hexachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Isopropylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m+p-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Methyl acrylate	µg/L		2 U	2 U	2 U	2 U
Methyl iodide	µg/L		5 U	5 U	5 U	5 U
Methyl methacrylate	µg/L		2 U	2 U	2 U	2 U
Methyl n-butyl ketone	µg/L		5 U	5 U	5 U	5 U
Methyl tert-butyl ether	µg/L		1 U	1 U	1 U	1 U
Methylacrylonitrile	µg/L		4 U	4 U	4 U	4 U
Naphthalene	µg/L		1 U	1 U	1 U	1 U
n-butyl chloride	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-propylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
o-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Pentachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Styrene (monomer)	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Tert-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Tetrachloroethene	µg/L	0.8***	0.4 U	0.4 U	0.4 U	0.4 U
Tetrahydrofuran	µg/L		3 U	3 U	3 U	3 U
Toluene	µg/L	1****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,2-dichloroethene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,4-dichlorobutene	µg/L		5 U	5 U	5 U	5 U
Tribromomethane (Bromoform)	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	µg/L	3***	0.4 U	0.4 U	0.4 U	0.4 U
Trichlorofluoromethane (CFC-11)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Vinyl chloride	µg/L	0.02***	0.01 U	0.01 U	0.01 U	0.01 U

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen
**** = 246-290 WAC criteria

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.

J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

Units:

µg/L= micrograms per liter

Results shown in bold exceed Ground Water Quality Criteria.

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-2 3/12/2018	B-2 6/20/2018	B-2 9/6/2018	B-2 12/4/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
1,1,1,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,1-trichloroethane	µg/L	200*	0.4 U	0.4 U	0.4 U	0.4 U
1,1,2,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichlorofluorotoluene (Freon-113)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethane	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethene	µg/L	7****	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2****	1 U	1 U	1 U	1 U
1,2-dibromoethane (EDB)	µg/L	0.001***	0.01 U	0.01 U	0.01 U	0.01 U
1,2-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloroethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloropropane	µg/L	0.6***	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,3-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,4-dichlorobenzene	µg/L	4***	0.4 U	0.4 U	0.4 U	0.4 U
1,4-dioxane	µg/L	7***	5 U	5 U	5 U	5 U
2,2-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-butanone	µg/L		3 U	3 U	3 U	3 U
2-chloroethyl vinyl ether	µg/L		2 U	2 U	2 U	2 U
2-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-nitropropane	µg/L		10 U	10 U	10 U	10 U
2-phenylbutane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-methyl-2-pentanone	µg/L		4 U	4 U	4 U	4 U
Acetone	µg/L		3 U	3 U	3 U	3 U
Acrolein	µg/L		4 U	4 U	4 U	4 U
Acrylonitrile	µg/L	0.07***	0.05 U	0.05 U	0.05 U	0.05 U
Allyl chloride	µg/L		2 U	2 U	2 U	2 U
Benzene	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Bromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon disulfide	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon tetrachloride	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chlorodibromomethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorodifluoromethane (Freon-22)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroform	µg/L	7.0***	0.4 U	0.4 U	0.4 U	0.4 U
Chloromethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
cis-1,2-dichloroethene	µg/L	70****	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Cymene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dibromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichlorodifluoromethane (CFC-12)	µg/L		0.9	0.08	0.6	1.1
Dichloromethane	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Dichloromonofluoromethane (Freon-21)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Diethyl ether	µg/L		0.4 U	0.4 U	0.4 U	0.4 U

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-2 3/12/2018	B-2 6/20/2018	B-2 9/6/2018	B-2 12/4/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
Ethyl methacrylate	µg/L		3 U	3 U	3 U	3 U
Ethylbenzene	µg/L	700****	0.4 U	0.4 U	0.4 U	0.4 U
Hexachloro-1,3-butadiene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Hexachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Isopropylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m+p-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Methyl acrylate	µg/L		2 U	2 U	2 U	2 U
Methyl iodide	µg/L		5 U	5 U	5 U	5 U
Methyl methacrylate	µg/L		2 U	2 U	2 U	2 U
Methyl n-butyl ketone	µg/L		5 U	5 U	5 U	5 U
Methyl tert-butyl ether	µg/L		1 U	1 U	1 U	1 U
Methylacrylonitrile	µg/L		4 U	4 U	4 U	4 U
Naphthalene	µg/L		1 U	1 U	1 U	1 U
n-butyl chloride	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-propylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
o-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Pentachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Styrene (monomer)	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Tert-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Tetrachloroethene	µg/L	0.8***	0.4 U	0.4 U	0.4 U	0.4 U
Tetrahydrofuran	µg/L		3 U	3 U	3 U	3 U
Toluene	µg/L	1****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,2-dichloroethene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,4-dichlorobutene	µg/L		5 U	5 U	5 U	5 U
Tribromomethane (Bromoform)	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	µg/L	3***	0.4 U	0.4 U	0.4 U	0.4 U
Trichlorofluoromethane (CFC-11)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Vinyl chloride	µg/L	0.02***	0.01 U	0.01 U	0.01 U	0.01 U

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen
**** = 246-290 WAC criteria

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.

J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

Units:

µg/L= micrograms per liter

Results shown in bold exceed Ground Water Quality Criteria.

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-3 3/12/2018	B-3 6/19/2018	B-3 9/10/2018	B-3 12/5/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
1,1,1,2-tetrachloroethane	µg/L		0.4 U	0.4 U	1 U	0.4 U
1,1,1-trichloroethane	µg/L	200*	0.4 U	0.4 U	0.4 U	0.4 U
1,1,2,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichlorofluorotoluene (Freon-113)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethane	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethene	µg/L	7****	0.4 U	0.4 U	4 U	0.4 U
1,1-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2****	1 U	1 U	0.04 U	1 U
1,2-dibromoethane (EDB)	µg/L	0.001***	0.01 U	0.01 U	0.01 U	0.01 U
1,2-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloroethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloropropane	µg/L	0.6***	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-trimethylbenzene	µg/L		0.4 U	0.4 U	3 U	0.4 U
1,3-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,4-dichlorobenzene	µg/L	4***	0.4 U	0.4 U	0.4 U	0.4 U
1,4-dioxane	µg/L	7***	5 U	5 U	5 U	5 U
2,2-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-butanone	µg/L		3 U	3 U	0.4 U	3 U
2-chloroethyl vinyl ether	µg/L		2 U	2 U	0.45 UU	2 U
2-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-nitropropane	µg/L		10 U	10 U	0.4 U	10 U
2-phenylbutane	µg/L		0.4 U	0.4 U	5 U	0.4 U
4-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-methyl-2-pentanone	µg/L		4 U	4 U	0.4 U	4 U
Acetone	µg/L		3 U	3 U	0.4 U	3 U
Acrolein	µg/L		4 U	4 U	0.4 U	4 U
Acrylonitrile	µg/L	0.07***	0.05 U	0.05 U	0.05 U	0.05 U
Allyl chloride	µg/L		2 U	2 U	3 U	2 U
Benzene	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Bromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon disulfide	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon tetrachloride	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	µg/L	100****	0.4 U	0.4 U	3 U	0.4 U
Chlorobromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chlorodibromomethane	µg/L	0.5***	0.4 U	0.4 U	4 U	0.4 U
Chlorodifluoromethane (Freon-22)	µg/L		1.2	0.4 U	0.4 U	0.5
Chloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroform	µg/L	7.0***	0.4 U	0.4 U	0.4 U	0.4 U
Chloromethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
cis-1,2-dichloroethene	µg/L	70****	0.4 U	0.4 U	1 U	0.4 U
cis-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Cymene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dibromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichlorodifluoromethane (CFC-12)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichloromethane	µg/L	5***	0.4 U	0.4 U	2 U	0.4 U
Dichloromonofluoromethane (Freon-21)	µg/L		1.4	0.4 U	0.4 U	0.5
Diethyl ether	µg/L		4.2	0.5	0.4 U	0.8

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-3 3/12/2018	B-3 6/19/2018	B-3 9/10/2018	B-3 12/5/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
Ethyl methacrylate	µg/L		3 U	3 U	0.4 U	3 U
Ethylbenzene	µg/L	700****	0.4 U	0.4 U	2 U	0.4 U
Hexachloro-1,3-butadiene	µg/L		0.4 U	0.4 U	3 U	0.4 U
Hexachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Isopropylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m+p-xylene	µg/L		0.4 U	0.4 U	5 U	0.4 U
m-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Methyl acrylate	µg/L		2 U	2 U	0.4 U	2 U
Methyl iodide	µg/L		5 U	5 U	0.4 U	5 U
Methyl methacrylate	µg/L		2 U	2 U	0.4 U	2 U
Methyl n-butyl ketone	µg/L		5 U	5 U	0.4 U	5 U
Methyl tert-butyl ether	µg/L		0.6	1 U	0.4 U	1 U
Methylacrylonitrile	µg/L		4 U	4 U	0.4 U	4 U
Naphthalene	µg/L		1 U	1 U	0.4 U	1 U
n-butyl chloride	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-propylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
o-xylene	µg/L		0.4 U	0.4 U	2 U	0.4 U
Pentachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Styrene (monomer)	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Tert-butylbenzene	µg/L		0.4 U	0.4 U	10 U	0.4 U
Tetrachloroethene	µg/L	0.8***	0.4 U	0.4 U	5 U	0.4 U
Tetrahydrofuran	µg/L		3.2	3 U	0.4 U	3 U
Toluene	µg/L	1****	0.4 U	0.4 U	1 U	0.4 U
Trans-1,2-dichloroethene	µg/L	100****	0.4 U	0.4 U	2 U	0.4 U
Trans-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,4-dichlorobutene	µg/L		5 U	5 U	0.4 U	5 U
Tribromomethane (Bromoform)	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	µg/L	3***	0.4 U	0.4 U	0.4 U	0.4 U
Trichlorofluoromethane (CFC-11)	µg/L		0.4 U	0.4 U	2 U	0.4 U
Vinyl chloride	µg/L	0.02***	**0.137**	0.01 U	0.01 U	**0.023**

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen
**** = 246-290 WAC criteria

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.

J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

Units:

µg/L= micrograms per liter

Results shown in bold exceed Ground Water Quality Criteria.

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-4 3/13/2018	B-4 6/21/2018	B-4 9/12/2018	B-4 12/12/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
1,1,1,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,1-trichloroethane	µg/L	200*	0.4 U	0.4 U	0.4 U	0.4 U
1,1,2,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichlorofluorotoluene (Freon-113)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethane	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethene	µg/L	7****	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2****	1 U	1 U	1 U	1 U
1,2-dibromoethane (EDB)	µg/L	0.001***	0.01 U	0.01 U	0.01 U	0.01 U
1,2-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloroethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloropropane	µg/L	0.6***	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,3-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,4-dichlorobenzene	µg/L	4***	0.4 U	0.4 U	0.4 U	0.4 U
1,4-dioxane	µg/L	7***	5 U	5 U	5 U	5 U
2,2-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-butanone	µg/L		3 U	3 U	3 U	3 U
2-chloroethyl vinyl ether	µg/L		2 U	2 U	2 U	2 U
2-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-nitropropane	µg/L		10 U	10 U	10 U	10 U
2-phenylbutane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-methyl-2-pentanone	µg/L		4 U	4 U	4 U	4 U
Acetone	µg/L		3 U	3 U	3 U	3 U
Acrolein	µg/L		4 U	4 U	4 U	4 U
Acrylonitrile	µg/L	0.07***	0.05 U	0.05 U	0.05 U	0.05 U
Allyl chloride	µg/L		2 U	2 U	2 U	2 U
Benzene	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Bromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon disulfide	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon tetrachloride	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chlorodibromomethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorodifluoromethane (Freon-22)	µg/L		5.3	7.1	2.9	5.7
Chloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroform	µg/L	7.0***	0.4 U	0.4 U	0.4 U	0.4 U
Chloromethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
cis-1,2-dichloroethene	µg/L	70****	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Cymene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dibromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichlorodifluoromethane (CFC-12)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichloromethane	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Dichloromonofluoromethane (Freon-21)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Diethyl ether	µg/L		0.4 U	0.4 U	0.4 U	0.4 U

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-4 3/13/2018	B-4 6/21/2018	B-4 9/12/2018	B-4 12/12/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
Ethyl methacrylate	µg/L		3 U	3 U	3 U	3 U
Ethylbenzene	µg/L	700****	0.4 U	0.4 U	0.4 U	0.4 U
Hexachloro-1,3-butadiene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Hexachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Isopropylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m+p-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Methyl acrylate	µg/L		2 U	2 U	2 U	2 U
Methyl iodide	µg/L		5 U	5 U	5 U	5 U
Methyl methacrylate	µg/L		2 U	2 U	2 U	2 U
Methyl n-butyl ketone	µg/L		5 U	5 U	5 U	5 U
Methyl tert-butyl ether	µg/L		1 U	1 U	1 U	1 U
Methylacrylonitrile	µg/L		4 U	4 U	4 U	4 U
Naphthalene	µg/L		1 U	1 U	1 U	1 U
n-butyl chloride	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-propylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
o-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Pentachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Styrene (monomer)	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Tert-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Tetrachloroethene	µg/L	0.8***	0.4 U	0.4 U	0.4 U	0.4 U
Tetrahydrofuran	µg/L		3 U	3 U	3 U	3 U
Toluene	µg/L	1****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,2-dichloroethene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,4-dichlorobutene	µg/L		5 U	5 U	5 U	5 U
Tribromomethane (Bromoform)	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	µg/L	3***	0.4 U	0.4 U	0.4 U	0.4 U
Trichlorofluoromethane (CFC-11)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Vinyl chloride	µg/L	0.02***	0.019	0.01 U	**0.021**	0.01 U

Groundwater Quality Criteria:

* = Primary Contaminant

** = Secondary Contaminant

*** = Carcinogen

**** = 246-290 WAC criteria

Units:

µg/L= micrograms per liter

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.

J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

Results shown in bold exceed Ground Water Quality Criteria.

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-5 3/15/2018	B-5 6/21/2018	B-5 9/11/2018	B-5 12/13/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
1,1,1,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,1-trichloroethane	µg/L	200*	0.4 U	0.4 U	0.4 U	0.4 U
1,1,2,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichlorofluorotoluene (Freon-113)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethane	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethene	µg/L	7****	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2****	1 U	1 U	1 U	1 U
1,2-dibromoethane (EDB)	µg/L	0.001***	0.01 U	0.01 U	0.01 U	0.01 U
1,2-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloroethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloropropane	µg/L	0.6***	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,3-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,4-dichlorobenzene	µg/L	4***	0.4 U	0.4 U	0.4 U	0.4 U
1,4-dioxane	µg/L	7***	5.4	5.8	5 U	5 U
2,2-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-butanone	µg/L		3 U	3 U	3 U	3 U
2-chloroethyl vinyl ether	µg/L		2 U	2 U	2 U	2 U
2-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-nitropropane	µg/L		10 U	10 U	10 U	10 U
2-phenylbutane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-methyl-2-pentanone	µg/L		4 U	4 U	4 U	4 U
Acetone	µg/L		3 U	3 U	3 U	3 U
Acrolein	µg/L		4 U	4 U	4 U	4 U
Acrylonitrile	µg/L	0.07***	0.05 U	0.05 U	0.05 U	0.05 U
Allyl chloride	µg/L		2 U	2 U	2 U	2 U
Benzene	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Bromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon disulfide	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon tetrachloride	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chlorodibromomethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorodifluoromethane (Freon-22)	µg/L		0.7	0.9	0.7	0.8
Chloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroform	µg/L	7.0***	0.4 U	0.4 U	0.4 U	0.4 U
Chloromethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
cis-1,2-dichloroethene	µg/L	70****	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Cymene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dibromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichlorodifluoromethane (CFC-12)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichloromethane	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Dichloromonofluoromethane (Freon-21)	µg/L		0.3 J	0.4 U	0.3 J	0.3 J
Diethyl ether	µg/L		3.3	3.6	2.1 U	2.8

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-5 3/15/2018	B-5 6/21/2018	B-5 9/11/2018	B-5 12/13/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
Ethyl methacrylate	µg/L		3 U	3 U	3 U	3 U
Ethylbenzene	µg/L	700****	0.4 U	0.4 U	0.4 U	0.4 U
Hexachloro-1,3-butadiene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Hexachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Isopropylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m+p-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Methyl acrylate	µg/L		2 U	2 U	2 U	2 U
Methyl iodide	µg/L		5 U	5 U	5 U	5 U
Methyl methacrylate	µg/L		2 U	2 U	2 U	2 U
Methyl n-butyl ketone	µg/L		5 U	5 U	5 U	5 U
Methyl tert-butyl ether	µg/L		1 U	1 U	1 U	1 U
Methylacrylonitrile	µg/L		4 U	4 U	4 U	4 U
Naphthalene	µg/L		1 U	1 U	1 U	1 U
n-butyl chloride	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-propylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
o-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Pentachloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Styrene (monomer)	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Tert-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Tetrachloroethene	µg/L	0.8***	0.4 U	0.4 U	0.4 U	0.4 U
Tetrahydrofuran	µg/L		3.9	3.7	4.2	3 U
Toluene	µg/L	1****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,2-dichloroethene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,4-dichlorobutene	µg/L		5 U	5 U	5 U	5 U
Tribromomethane (Bromoform)	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	µg/L	3***	0.4 U	0.4 U	0.4 U	0.4 U
Trichlorofluoromethane (CFC-11)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Vinyl chloride	µg/L	0.02***	**0.137**	**0.047**	**0.115**	**0.098**

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen
**** = 246-290 WAC criteria

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.

J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

Units:

µg/L= micrograms per liter

Results shown in bold exceed Ground Water Quality Criteria.

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional		
MONITORING WELL Sampling Date			B-10 6/26/2018	B-10 9/18/2018	B-10 12/13/2018
Analyte	Units	GW Quality Standards (173-200 WAC)			
1,1,1,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U
1,1,1-trichloroethane	µg/L	200*	0.4 U	0.4 U	0.4 U
1,1,2,2-tetrachloroethane	µg/L		0.4 U	0.4 U	0.4 U
1,1,2-trichloroethane	µg/L		0.4 U	0.4 U	0.4 U
1,1,2-trichlorofluorotoluene (Freon-113)	µg/L		0.4 U	0.4 U	0.4 U
1,1-dichloroethane	µg/L	1.0***	0.4 U	0.4 U	0.4 U
1,1-dichloroethene	µg/L	7****	0.4 U	0.4 U	0.4 U
1,1-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U
1,2,3-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U
1,2,3-trichloropropane	µg/L		0.4 U	0.4 U	0.4 U
1,2,4-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U
1,2,4-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2****	1 U	1 U	1 U
1,2-dibromoethane (EDB)	µg/L	0.001***	0.01 U	0.01 U	0.01 U
1,2-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U
1,2-dichloroethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U
1,2-dichloropropane	µg/L	0.6***	0.4 U	0.4 U	0.4 U
1,3,5-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U
1,3-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U
1,4-dichlorobenzene	µg/L	4***	0.4 U	0.4 U	0.4 U
1,4-dioxane	µg/L	7***	5 U	5 U	5 U
2,2-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U
2-butanone	µg/L		3 U	3 U	3 U
2-chloroethyl vinyl ether	µg/L		2 U	2 U	2 U
2-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U
2-nitropropane	µg/L		10 U	10 U	10 U
2-phenylbutane	µg/L		0.4 U	0.4 U	0.4 U
4-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U
4-methyl-2-pentanone	µg/L		4 U	4 U	4 U
Acetone	µg/L		3 U	3 U	3 U
Acrolein	µg/L		4 U	4 U	4 U
Acrylonitrile	µg/L	0.07***	0.05 U	0.05 U	0.05 U
Allyl chloride	µg/L		2 U	2 U	2 U
Benzene	µg/L	1.0***	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L		0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.3***	0.4 U	0.4 U	0.4 U
Bromomethane	µg/L		0.4 U	0.4 U	0.4 U
Carbon disulfide	µg/L		0.4 U	0.4 U	0.4 U
Carbon tetrachloride	µg/L	0.3***	0.4 U	0.4 U	0.4 U
Chlorobenzene	µg/L	100****	0.4 U	0.4 U	0.4 U
Chlorobromomethane	µg/L		0.4 U	0.4 U	0.4 U
Chlorodibromomethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U
Chlorodifluoromethane (Freon-22)	µg/L		0.4 U	0.4 U	0.4 U
Chloroethane	µg/L		0.4 U	0.4 U	0.4 U
Chloroform	µg/L	7.0***	0.4 U	0.4 U	0.4 U
Chloromethane	µg/L		0.4 U	0.4 U	0.4 U
cis-1,2-dichloroethene	µg/L	70****	0.4 U	0.4 U	0.4 U
cis-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U
Cymene	µg/L		0.4 U	0.4 U	0.4 U
Dibromomethane	µg/L		0.4 U	0.4 U	0.4 U
Dichlorodifluoromethane (CFC-12)	µg/L		0.4 U	0.4 U	0.4 U
Dichloromethane	µg/L	5***	0.4 U	0.4 U	0.4 U
Dichloromonofluoromethane (Freon-21)	µg/L		0.4 U	0.4 U	0.4 U
Diethyl ether	µg/L		0.4 U	0.4 U	0.4 U

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional		
MONITORING WELL Sampling Date			B-10 6/26/2018	B-10 9/18/2018	B-10 12/13/2018
Analyte	Units	GW Quality Standards (173-200 WAC)			
Ethyl methacrylate	µg/L		2 U	3 U	3 U
Ethylbenzene	µg/L	700****	0.4 U	0.4 U	0.4 U
Hexachloro-1,3-butadiene	µg/L		0.4 U	0.4 U	0.4 U
Hexachloroethane	µg/L		0.4 U	0.4 U	0.4 U
Isopropylbenzene	µg/L		0.4 U	0.4 U	0.4 U
m+p-xylene	µg/L		0.4 U	0.4 U	0.4 U
m-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U
Methyl acrylate	µg/L		2 U	2 U	2 U
Methyl iodide	µg/L		5 U	5 U	5 U
Methyl methacrylate	µg/L		2 U	2 U	2 U
Methyl n-butyl ketone	µg/L		5 U	5 U	5 U
Methyl tert-butyl ether	µg/L		1 U	1 U	1 U
Methylacrylonitrile	µg/L		4 U	4 U	4 U
Naphthalene	µg/L		1 U	1 U	1 U
n-butyl chloride	µg/L		0.4 U	0.4 U	0.4 U
n-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U
n-propylbenzene	µg/L		0.4 U	0.4 U	0.4 U
o-xylene	µg/L		0.4 U	0.4 U	0.4 U
Pentachloroethane	µg/L		0.4 U	0.4 U	0.4 U
Styrene (monomer)	µg/L	100****	0.4 U	0.4 U	0.4 U
Tert-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U
Tetrachloroethene	µg/L	0.8***	0.4 U	0.4 U	0.4 U
Tetrahydrofuran	µg/L		3 U	3 U	3 U
Toluene	µg/L	1****	0.4 U	0.4 U	0.4 U
Trans-1,2-dichloroethene	µg/L	100****	0.4 U	0.4 U	0.4 U
Trans-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U
Trans-1,4-dichlorobutene	µg/L		5 U	5 U	5 U
Tribromomethane (Bromoform)	µg/L	5***	0.4 U	0.4 U	0.4 U
Trichloroethene	µg/L	3***	0.4 U	0.4 U	0.4 U
Trichlorofluoromethane (CFC-11)	µg/L		0.4 U	0.4 U	0.4 U
Vinyl chloride	µg/L	0.02***	0.01 U	0.01 U	0.01 U

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen
**** = 246-290 WAC criteria

Qualifiers:

U — Indicates the analyte of interest was not detected, to

J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded

Units:

µg/L= micrograms per liter

Results shown in bold exceed Ground Water Quality Criteria.

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-12 3/12/2018	B-12 6/19/2018	B-12 9/10/2018	B-12 12/5/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
1,1,1,2-tetrachloroethane	µg/L		0.4 U	0.4 U	3 U	0.4 U
1,1,1-trichloroethane	µg/L	200*	0.4 U	0.4 U	0.4 U	0.4 U
1,1,2,2-tetrachloroethane	µg/L		0.4 U	0.4 U	3 U	0.4 U
1,1,2-trichloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1,2-trichlorofluorotoluene (Freon-113)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethane	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloroethene	µg/L	7****	0.4 U	0.4 U	0.4 U	0.4 U
1,1-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,3-trichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dibromo-3-chloropropane (DBCP)	µg/L	0.2****	1 U	1 U	0.04 U	1 U
1,2-dibromoethane (EDB)	µg/L	0.001***	0.01 U	0.01 U	0.01 U	0.01 U
1,2-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloroethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
1,2-dichloropropane	µg/L	0.6***	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-trimethylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,3-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
1,4-dichlorobenzene	µg/L	4***	0.4 U	0.4 U	0.4 U	0.4 U
1,4-dioxane	µg/L	7***	5 U	5 U	5 U	5 U
2,2-dichloropropane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-butanone	µg/L		3 U	3 U	0.4 U	3 U
2-chloroethyl vinyl ether	µg/L		2 U	2 U	0.45 U	2 U
2-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
2-nitropropane	µg/L		10 U	10 U	5 U	10 U
2-phenylbutane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-chlorotoluene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
4-methyl-2-pentanone	µg/L		4 U	4 U	4 U	4 U
Acetone	µg/L		3 U	3 U	0.4 U	3 U
Acrolein	µg/L		4 U	4 U	2 U	4 U
Acrylonitrile	µg/L	0.07***	0.05 U	0.05 U	0.05 U	0.05 U
Allyl chloride	µg/L		2 U	2 U	3 U	2 U
Benzene	µg/L	1.0***	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Bromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Carbon disulfide	µg/L		0.4 U	0.4 U	2 U	0.4 U
Carbon tetrachloride	µg/L	0.3***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorobenzene	µg/L	100****	0.4 U	0.4 U	2 U	0.4 U
Chlorobromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chlorodibromomethane	µg/L	0.5***	0.4 U	0.4 U	0.4 U	0.4 U
Chlorodifluoromethane (Freon-22)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Chloroform	µg/L	7.0***	0.4 U	0.4 U	0.4 U	0.4 U
Chloromethane	µg/L		0.4 U	0.4 U	10 U	0.4 U
cis-1,2-dichloroethene	µg/L	70****	0.4 U	0.4 U	0.4 U	0.4 U
cis-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Cymene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dibromomethane	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichlorodifluoromethane (CFC-12)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Dichloromethane	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Dichloromonofluoromethane (Freon-21)	µg/L		0.4 U	0.4 U	1 U	0.4 U
Diethyl ether	µg/L		0.4 U	0.4 U	0.4 U	0.4 U

2018 Volatile Organic Compound Monitoring Results
Inman Landfill

AQUIFER			Regional			
MONITORING WELL Sampling Date			B-12 3/12/2018	B-12 6/19/2018	B-12 9/10/2018	B-12 12/5/2018
Analyte	Units	GW Quality Standards (173-200 WAC)				
Ethyl methacrylate	µg/L		3 U	3 U	0.4 U	3 U
Ethylbenzene	µg/L	700****	0.4 U	0.4 U	0.4 U	0.4 U
Hexachloro-1,3-butadiene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Hexachloroethane	µg/L		0.4 U	0.4 U	3 U	0.4 U
Isopropylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m+p-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
m-dichlorobenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Methyl acrylate	µg/L		2 U	2 U	0.4 U	2 U
Methyl iodide	µg/L		5 U	5 U	0.4 U	5 U
Methyl methacrylate	µg/L		2 U	2 U	2 U	2 U
Methyl n-butyl ketone	µg/L		5 U	5 U	0.4 U	5 U
Methyl tert-butyl ether	µg/L		1 U	1 U	4 U	1 U
Methylacrylonitrile	µg/L		4 U	4 U	0.4 U	4 U
Naphthalene	µg/L		1 U	1 U	1 U	1 U
n-butyl chloride	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
n-propylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
o-xylene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Pentachloroethane	µg/L		0.4 U	0.4 U	5 U	0.4 U
Styrene (monomer)	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Tert-butylbenzene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Tetrachloroethene	µg/L	0.8***	0.4 U	0.4 U	0.4 U	0.4 U
Tetrahydrofuran	µg/L		3 U	3 U	0.4 U	3 U
Toluene	µg/L	1****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,2-dichloroethene	µg/L	100****	0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,3-dichloropropene	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Trans-1,4-dichlorobutene	µg/L		5 U	5 U	2 U	5 U
Tribromomethane (Bromoform)	µg/L	5***	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	µg/L	3***	0.4 U	0.4 U	0.4 U	0.4 U
Trichlorofluoromethane (CFC-11)	µg/L		0.4 U	0.4 U	0.4 U	0.4 U
Vinyl chloride	µg/L	0.02***	0.01 U	0.01 U	0.01 U	0.01 U

Groundwater Quality Criteria:

* = Primary Contaminant
** = Secondary Contaminant
*** = Carcinogen
**** = 246-290 WAC criteria

Qualifiers:

U — Indicates the analyte of interest was not detected, to the limit of detection indicated.

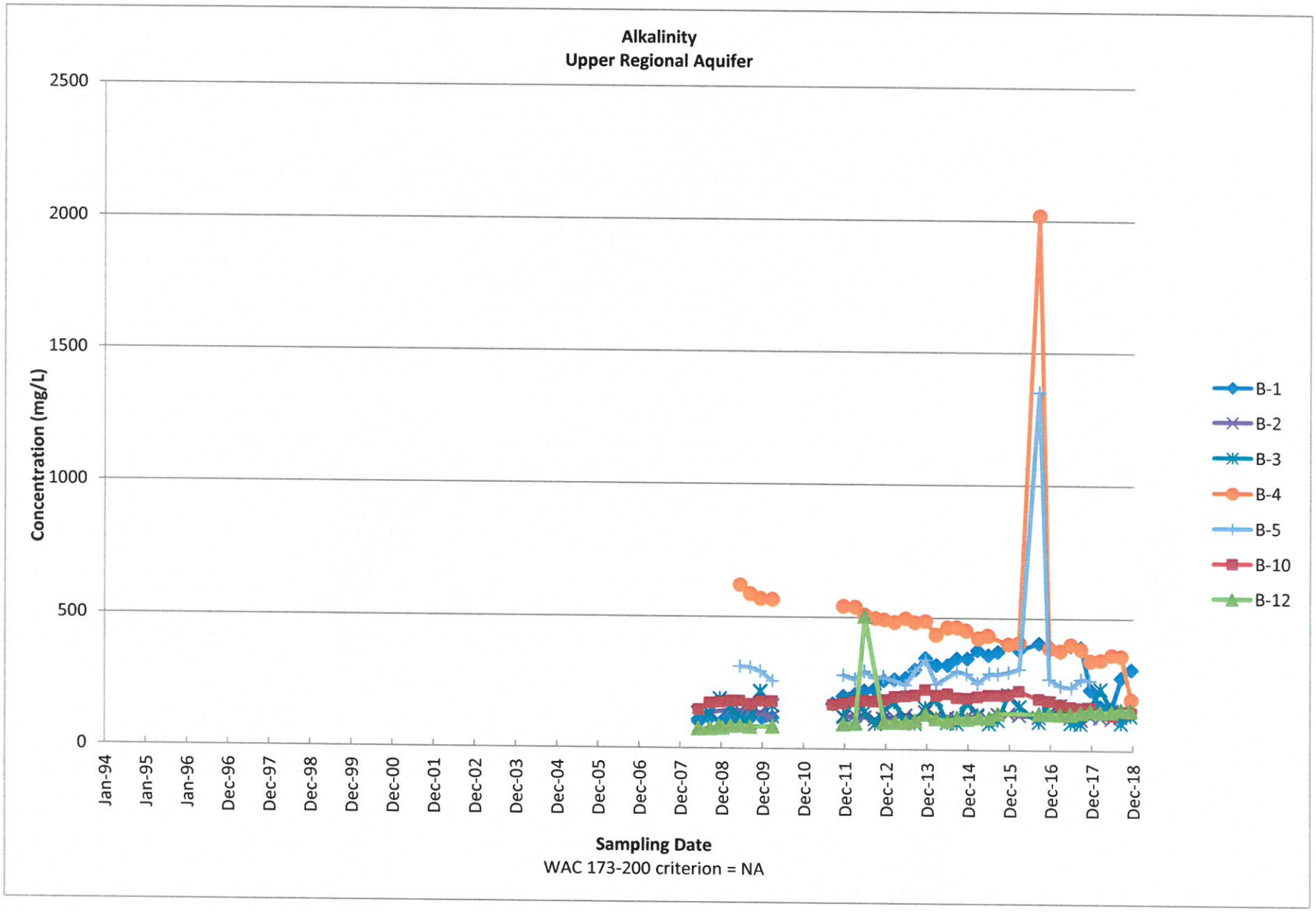
J — Indicates the analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

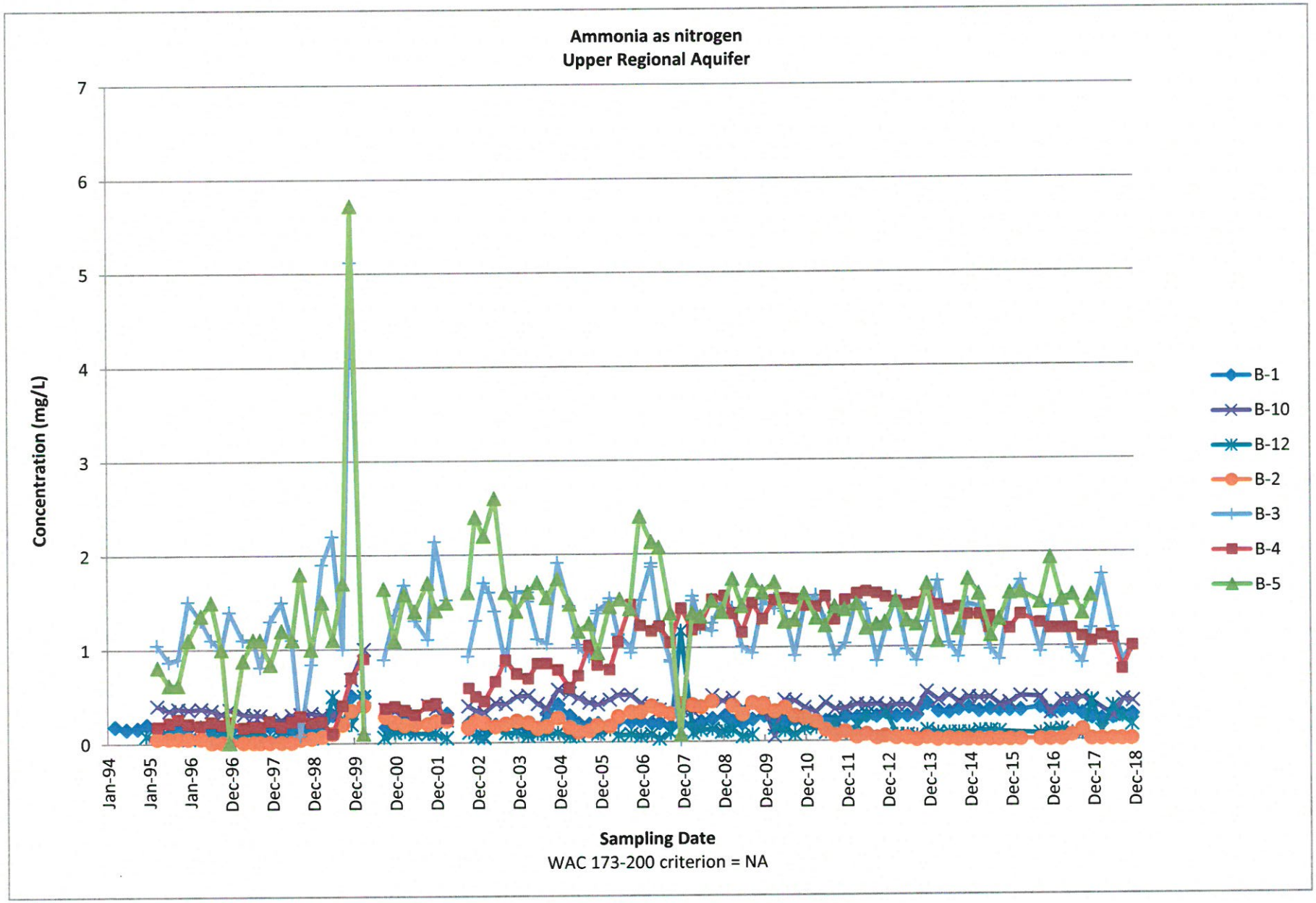
Units:

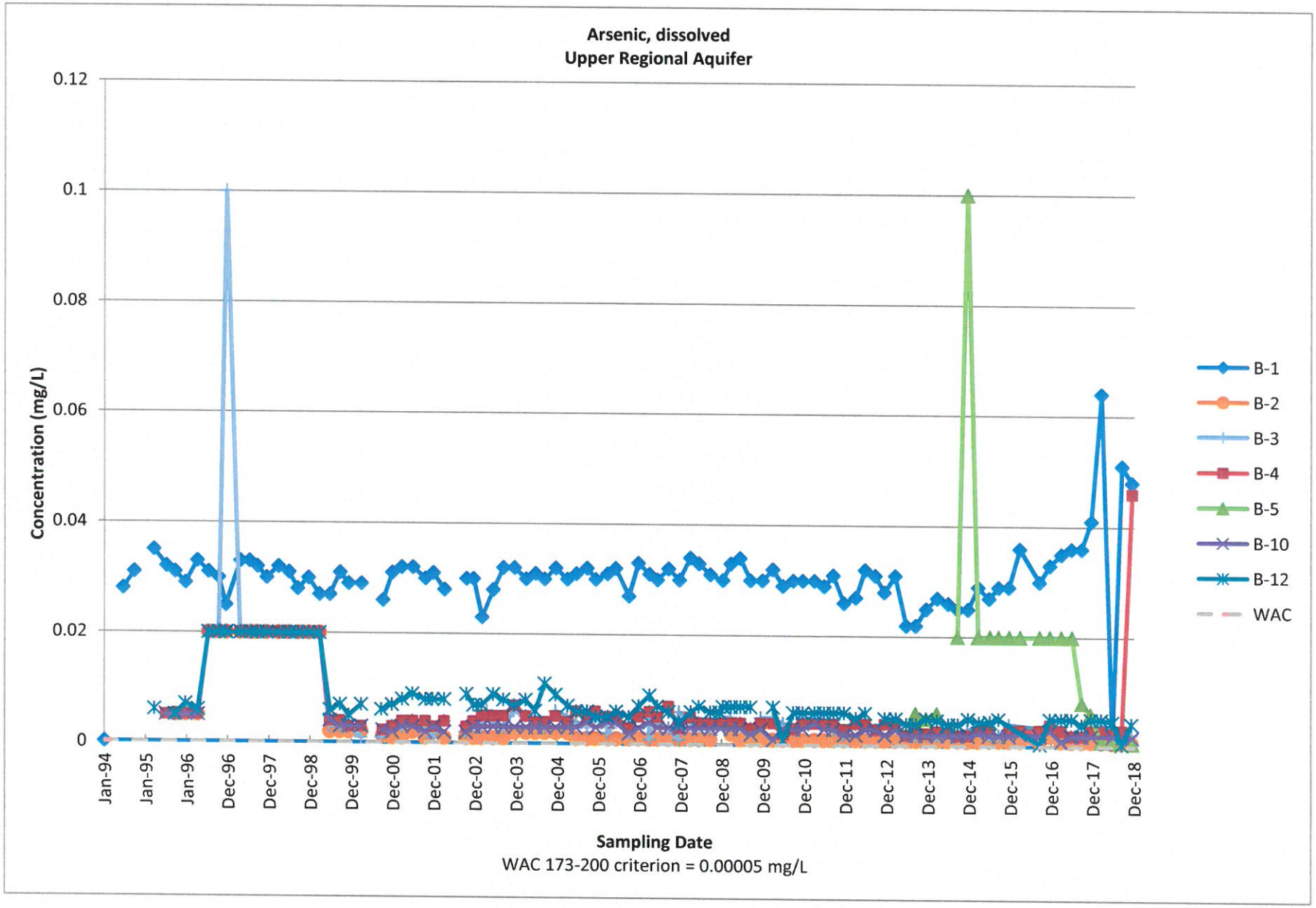
µg/L= micrograms per liter

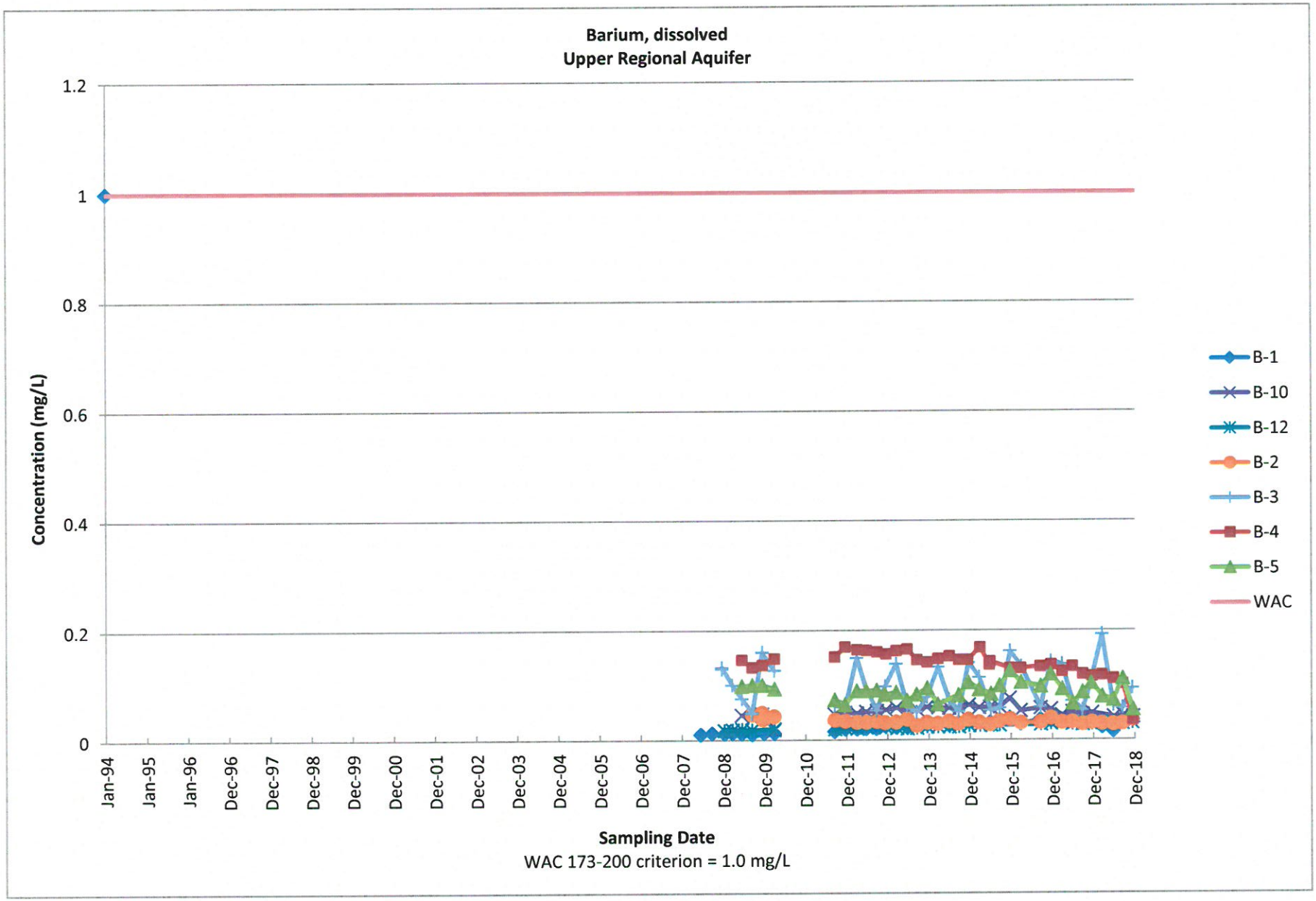
Results shown in bold exceed Ground Water Quality Criteria.

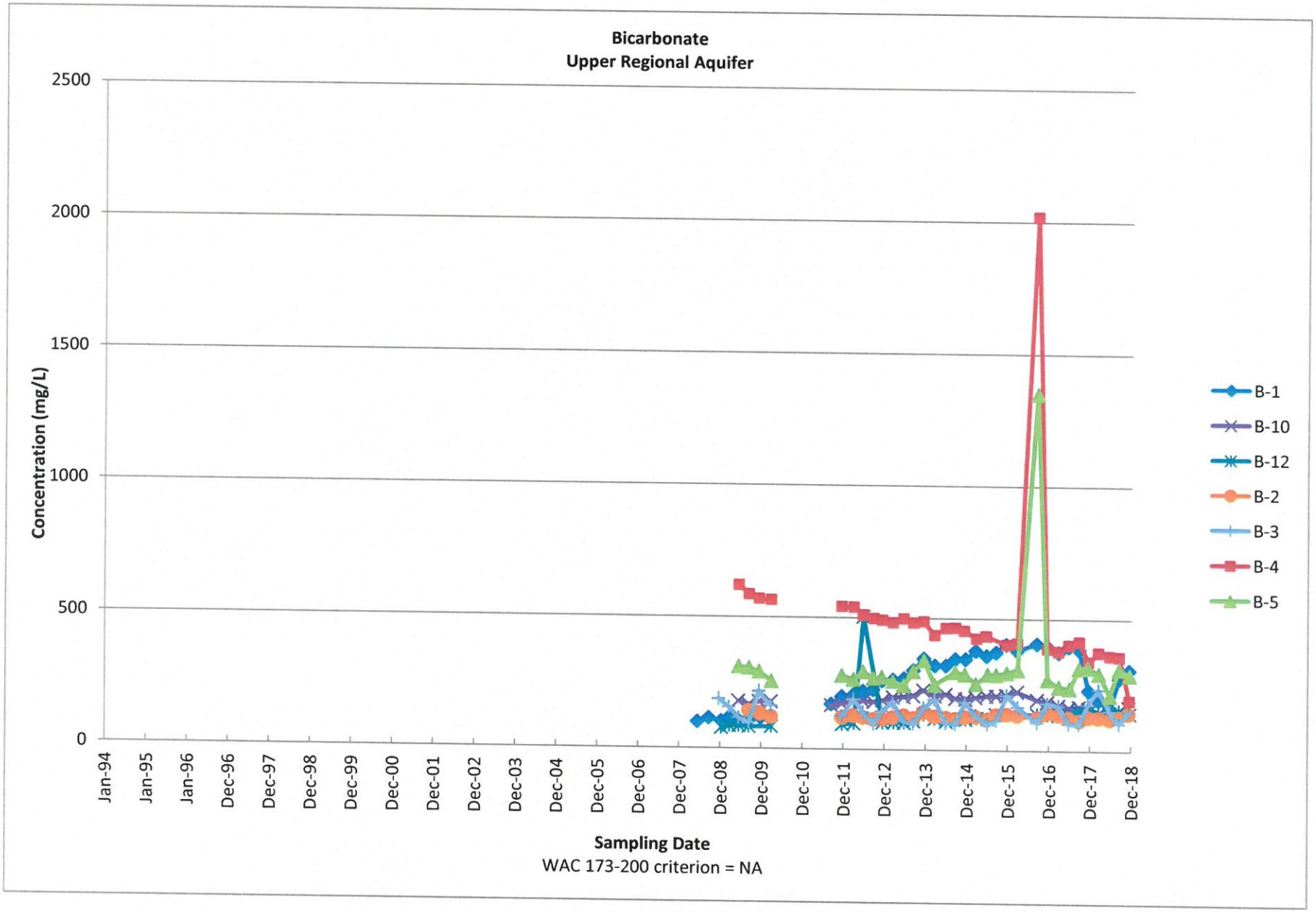
APPENDIX B-2:
Long-Term Time Series Plots 1994-2018 – Upper Regional Aquifer

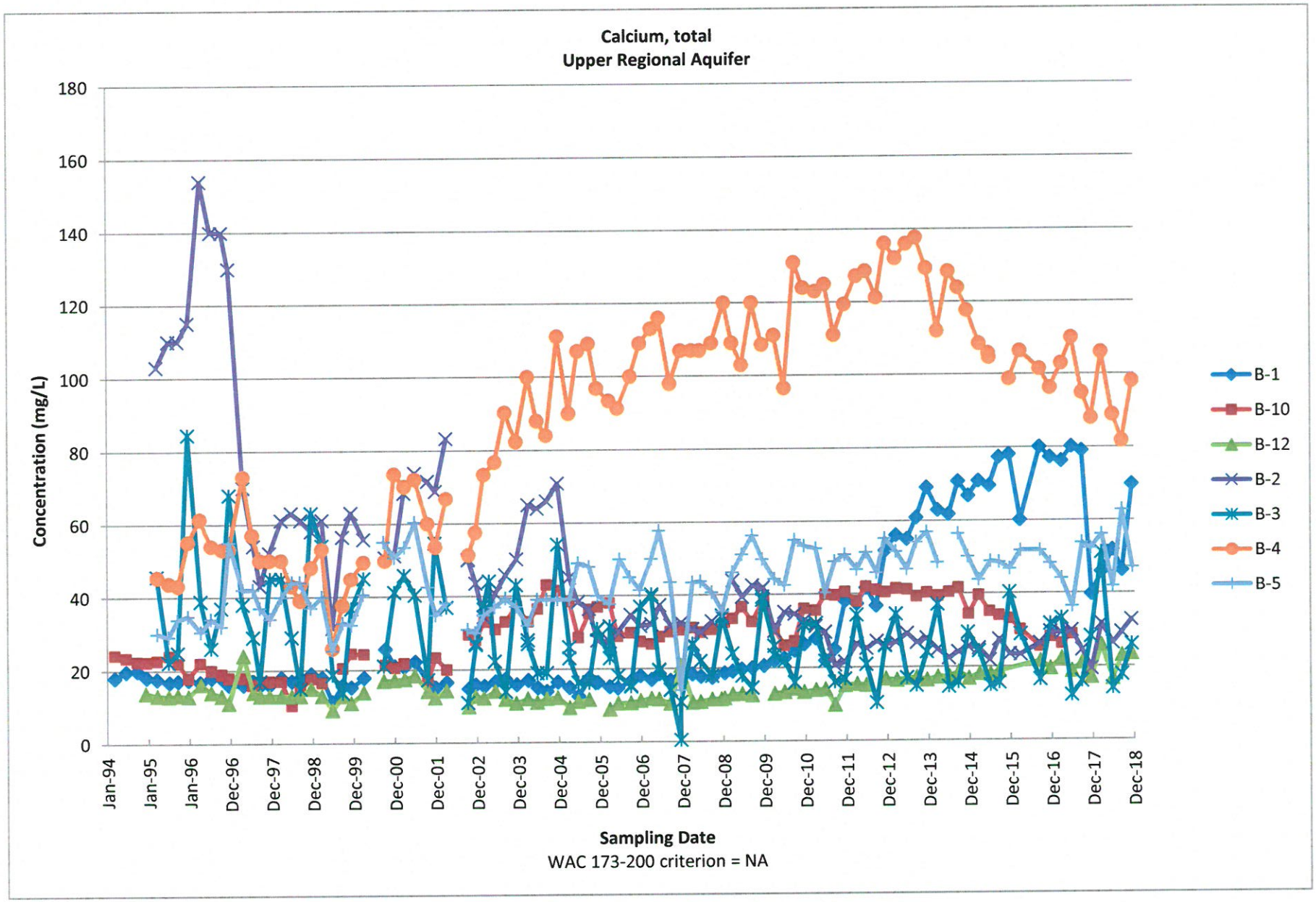

Alkalinity
Upper Regional Aquifer
2500
2000
1500
1000
500
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

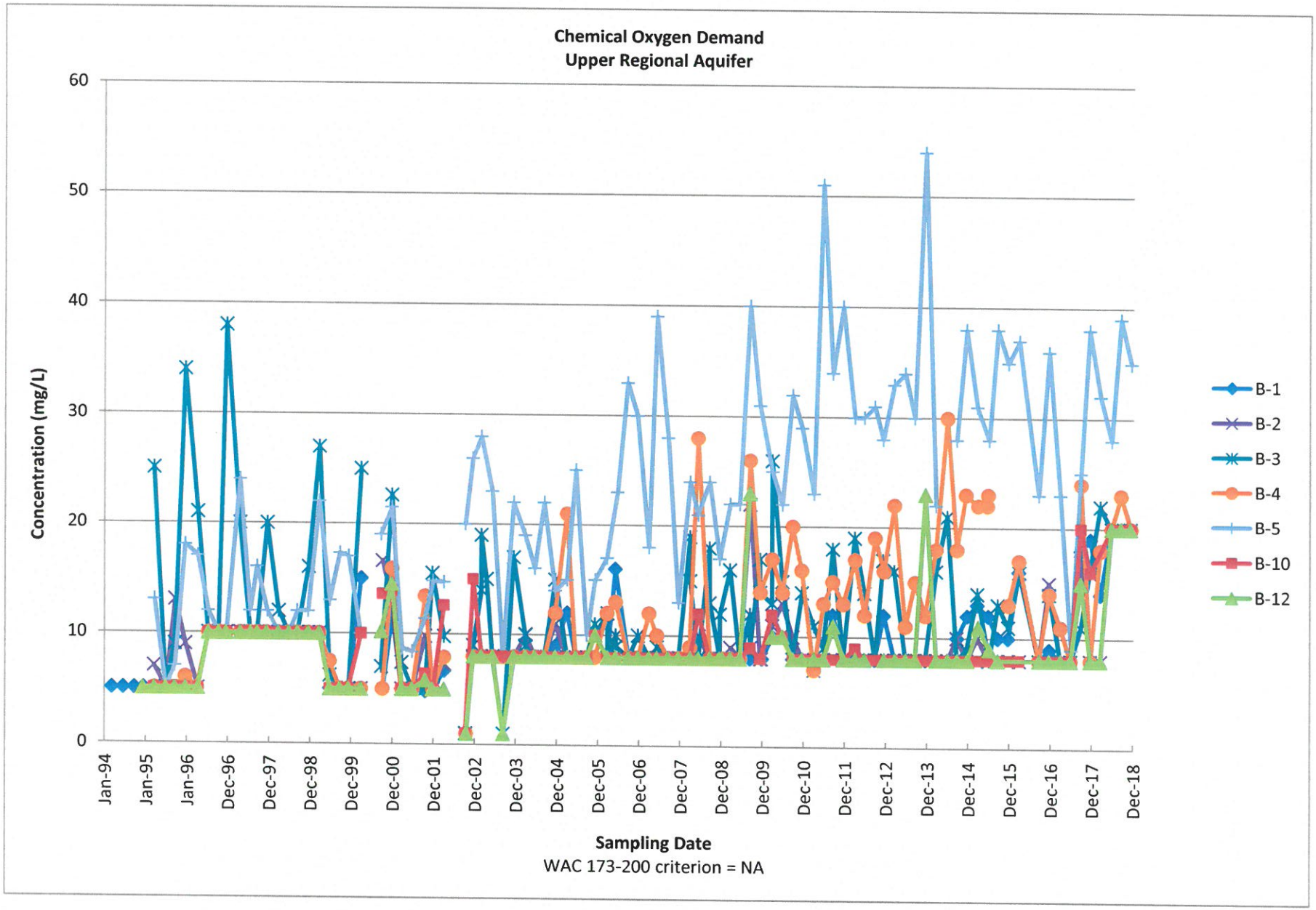

Ammonia as nitrogen
Upper Regional Aquifer
Concentration (mg/L)
0
1
2
3
4
5
6
7
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-10
B-12
B-2
B-3
B-4
B-5

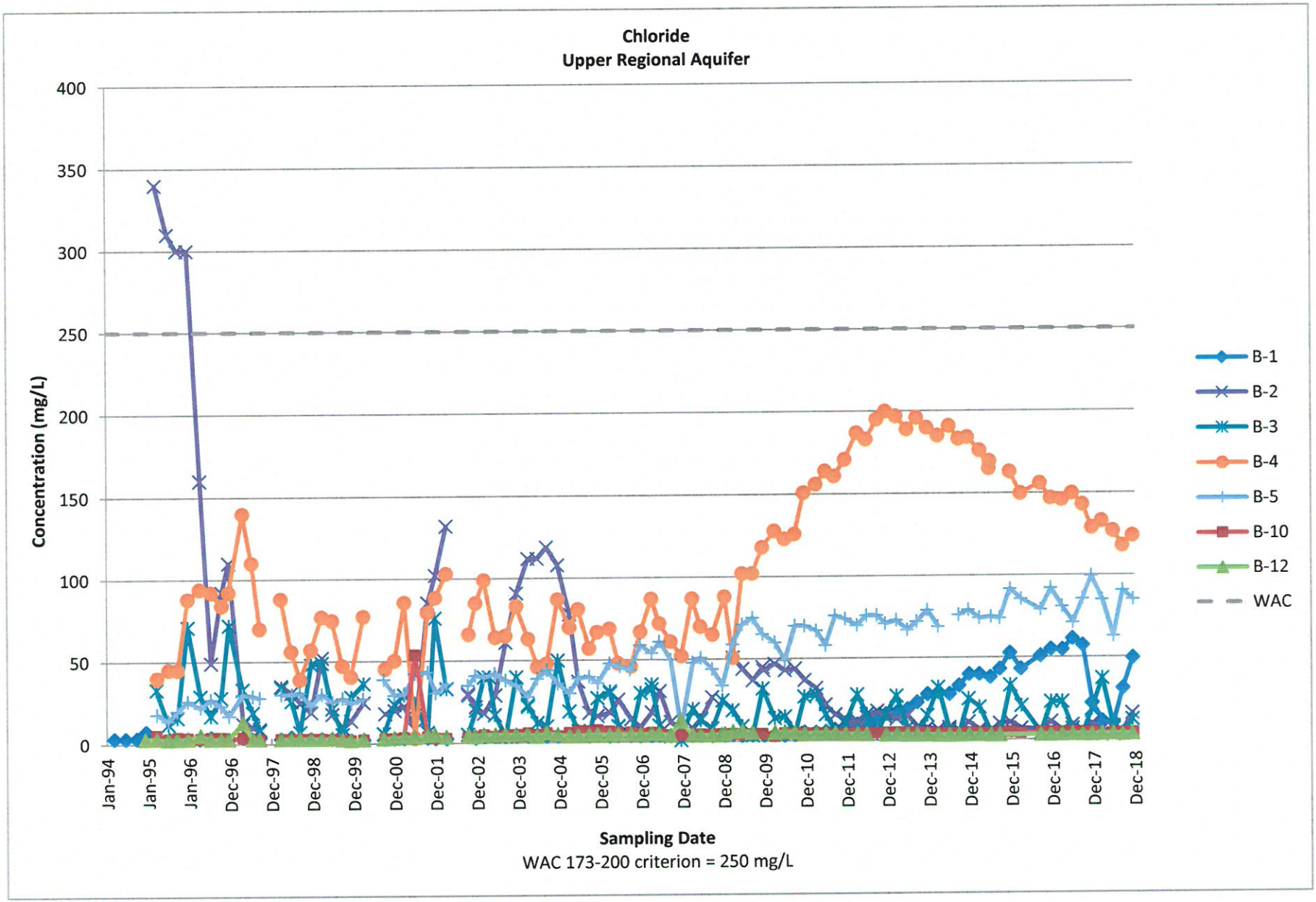

Arsenic, dissolved
Upper Regional Aquifer
0.12
0.1
0.08
0.06
0.04
0.02
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC
WAC 173-200 criterion = 0.00005 mg/L

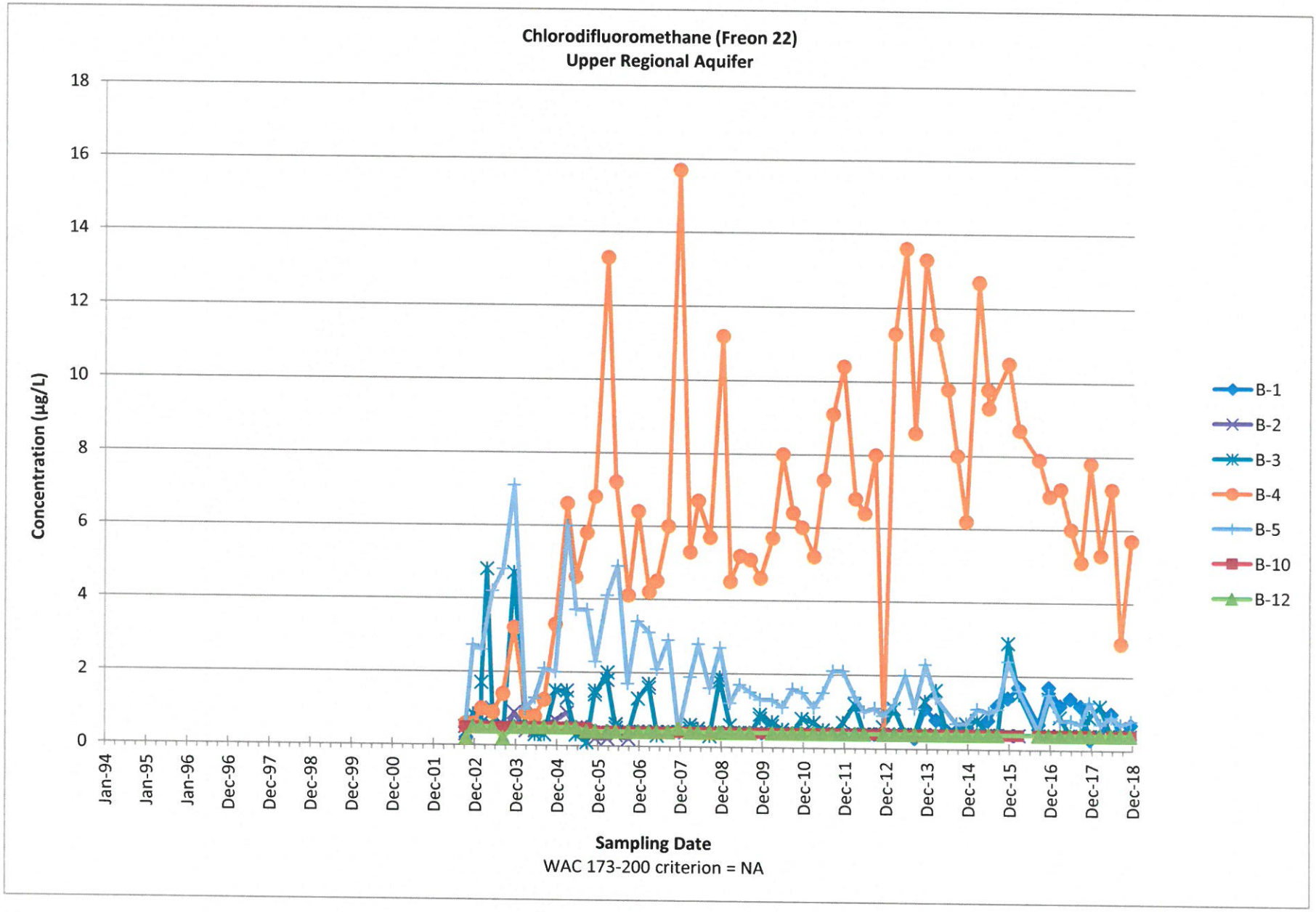

Barium, dissolved
Upper Regional Aquifer
Concentration (mg/L)
1.2
1
0.8
0.6
0.4
0.2
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = 1.0 mg/L
B-1
B-10
B-12
B-2
B-3
B-4
B-5
WAC

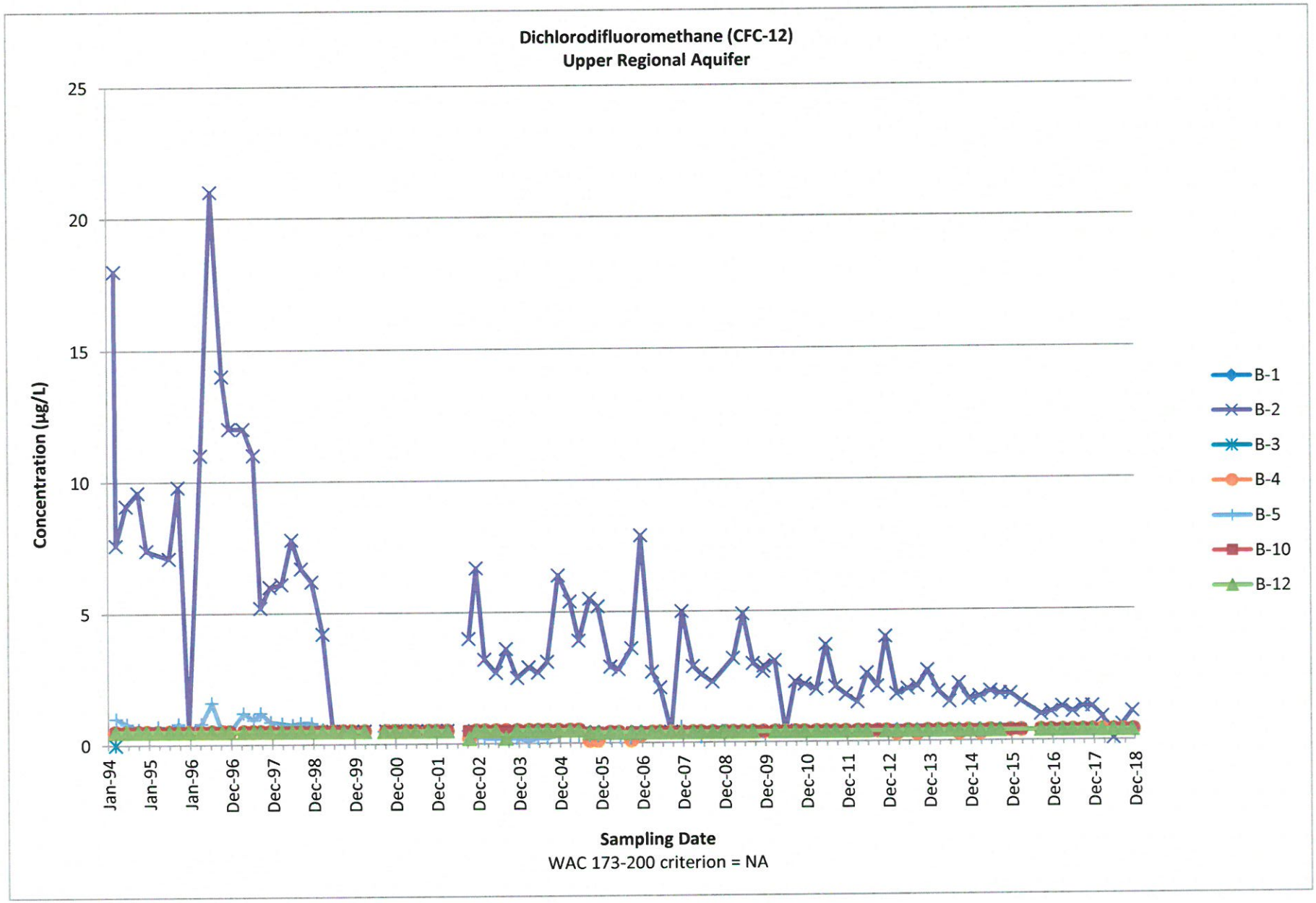

Bicarbonate
Upper Regional Aquifer
2500
2000
1500
1000
500
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-10
B-12
B-2
B-3
B-4
B-5

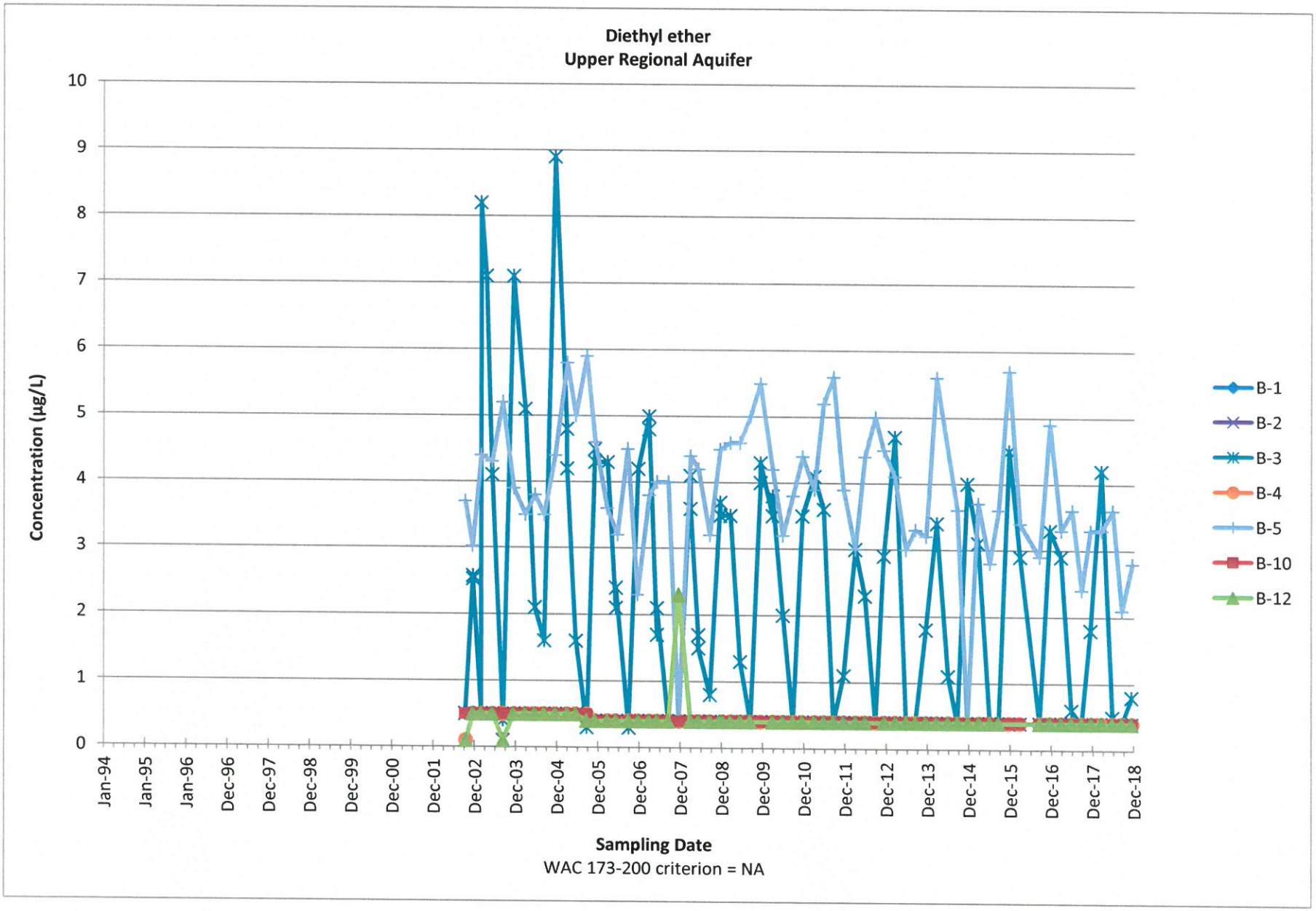

Calcium, total
Upper Regional Aquifer
Concentration (mg/L)
180
160
140
120
100
80
60
40
20
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-10
B-12
B-2
B-3
B-4
B-5

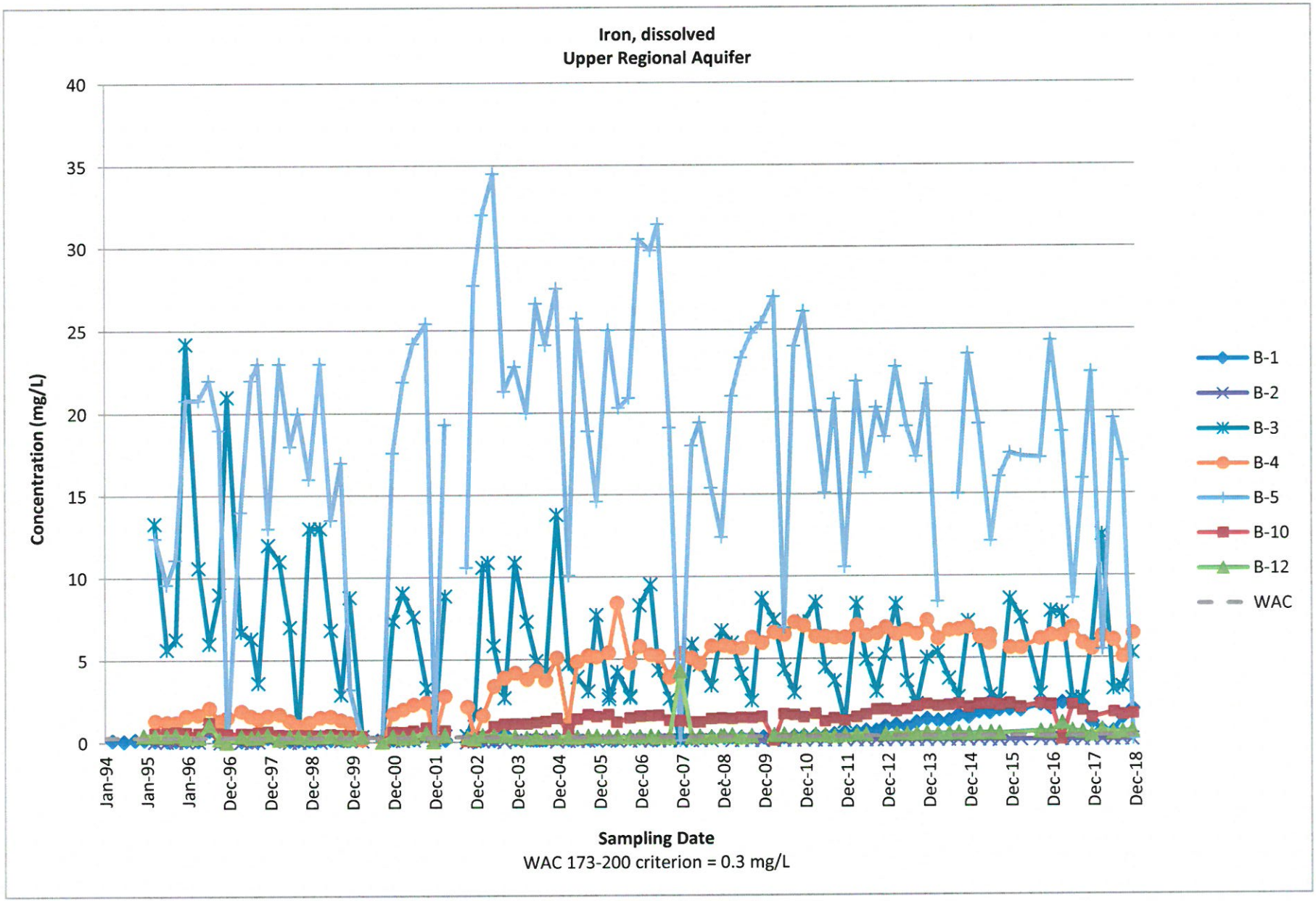

Chemical Oxygen Demand
Upper Regional Aquifer
Concentration (mg/L)
60
50
40
30
20
10
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

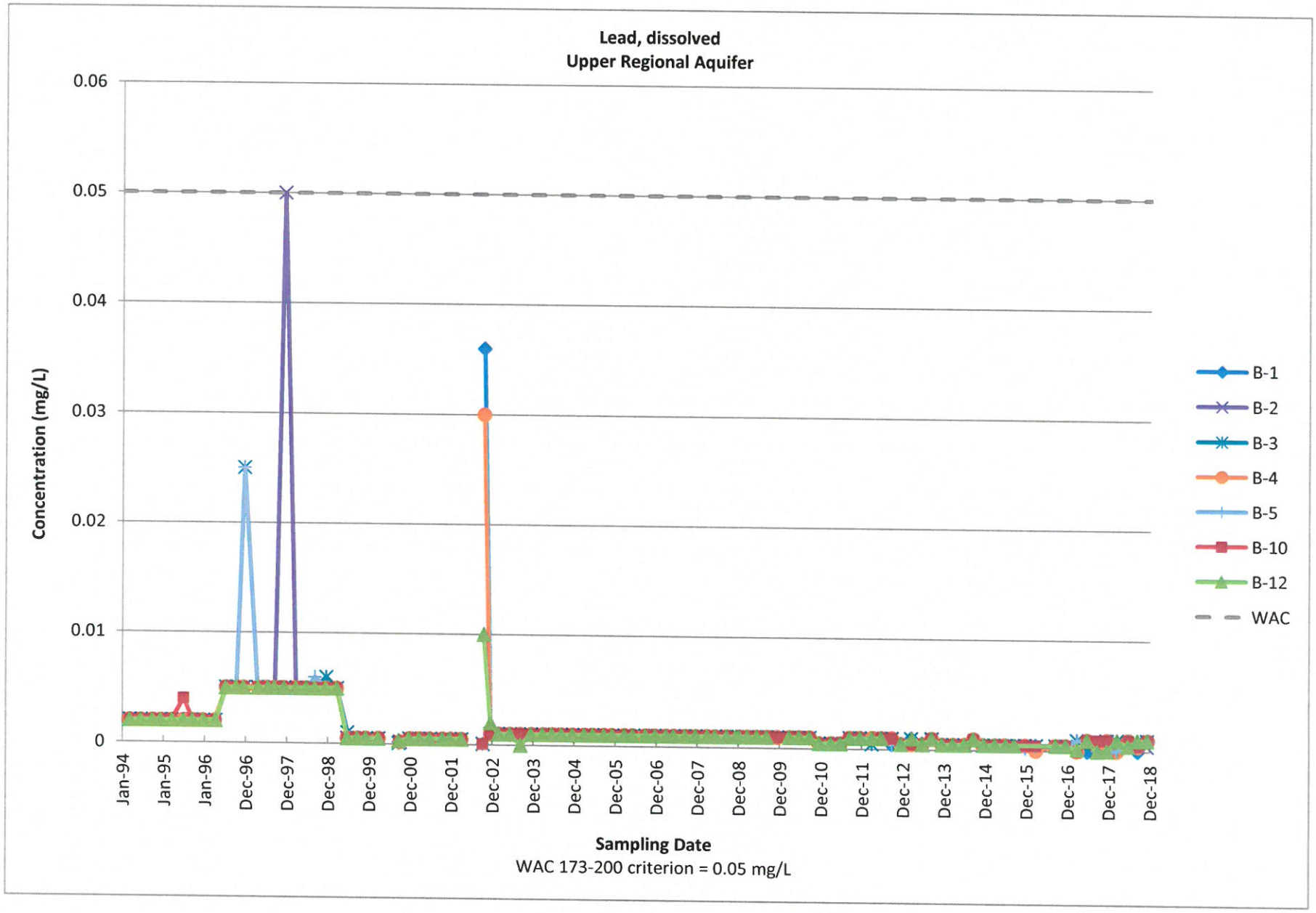

Chloride
Upper Regional Aquifer
Concentration (mg/L)
400
350
300
250
200
150
100
50
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC
WAC 173-200 criterion = 250 mg/L

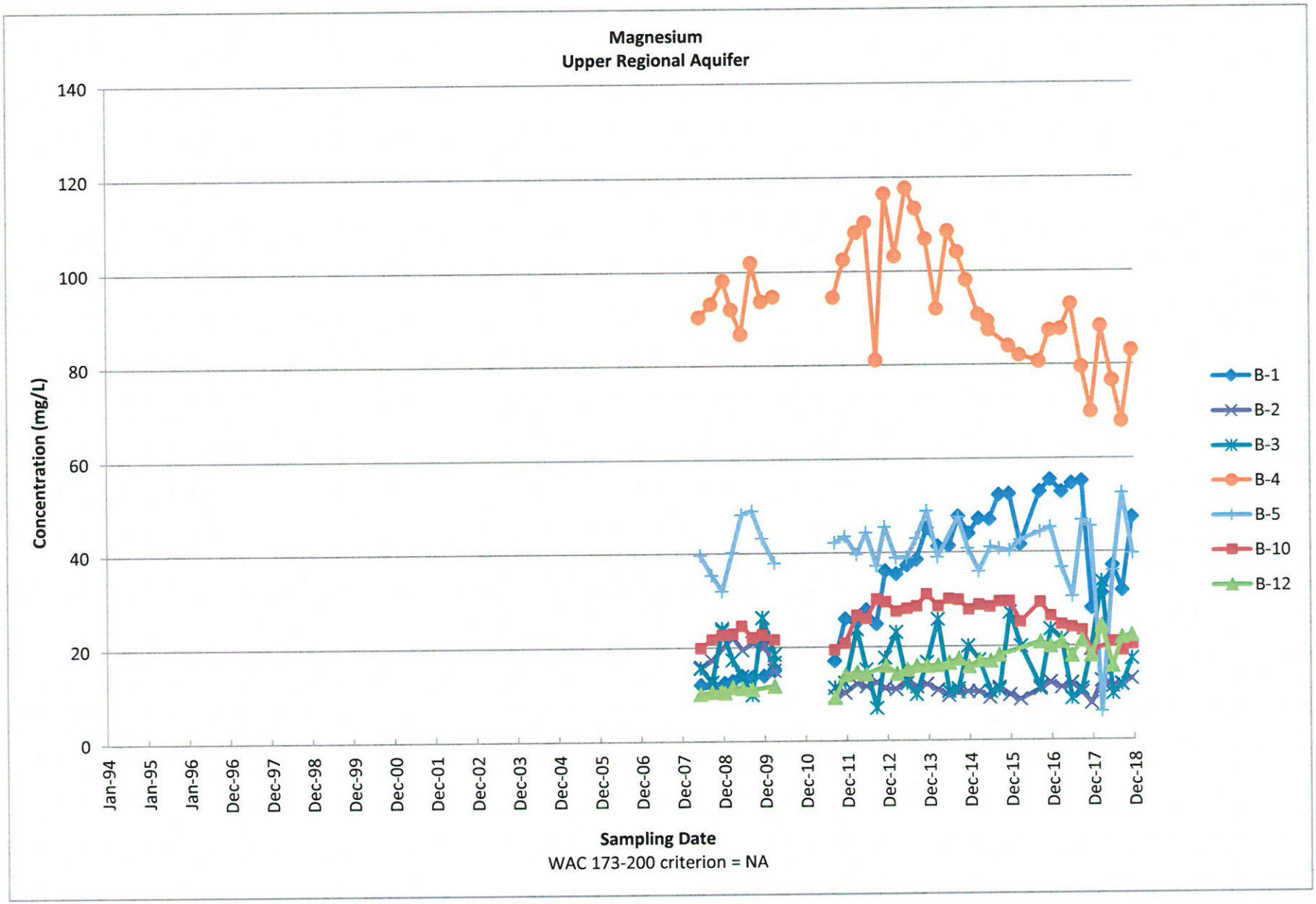

Chlorodifluoromethane (Freon 22)
Upper Regional Aquifer
Concentration (µg/L)
18
16
14
12
10
8
6
4
2
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

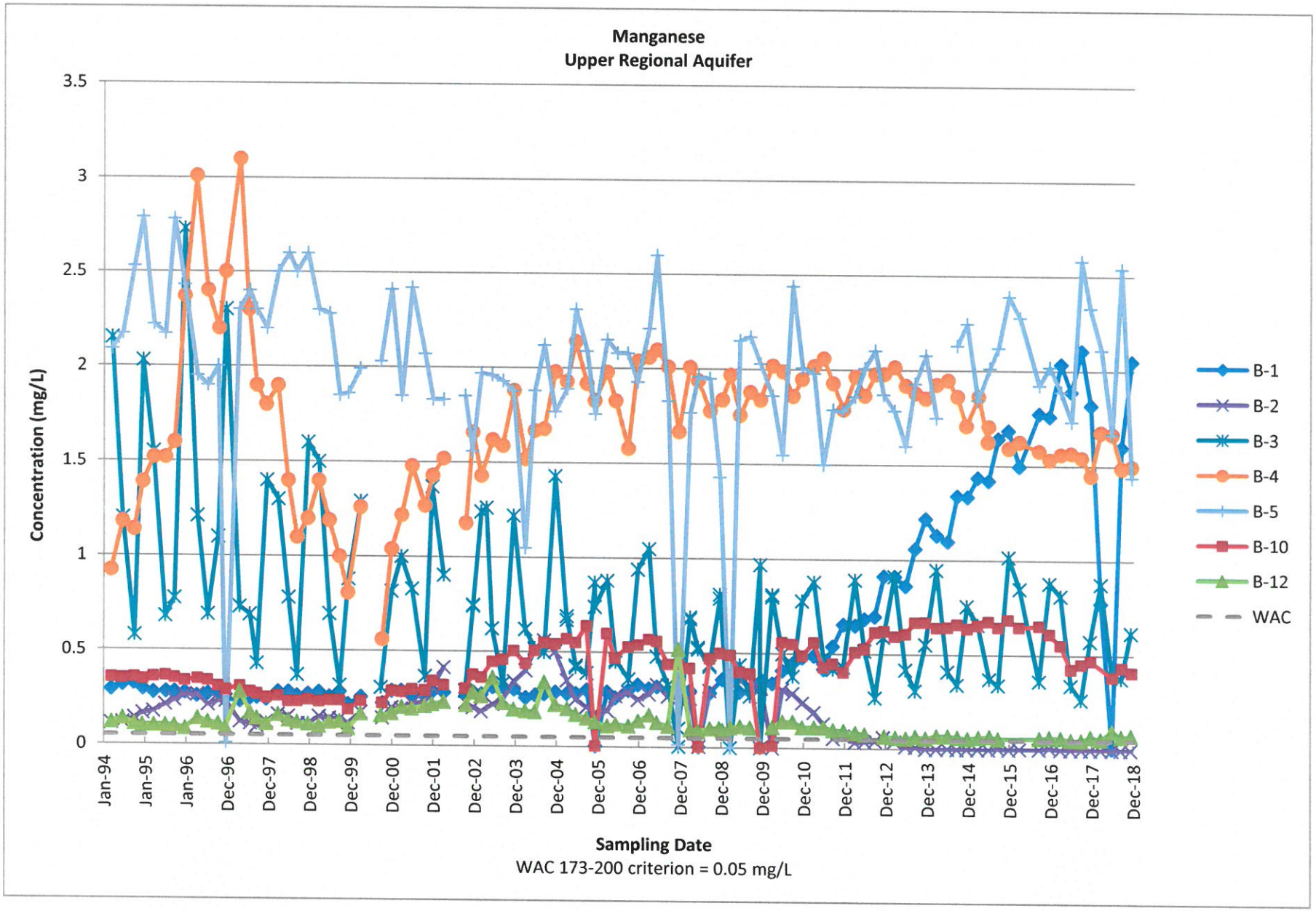

Dichlorodifluoromethane (CFC-12)
Upper Regional Aquifer
Concentration (µg/L)
25
20
15
10
5
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

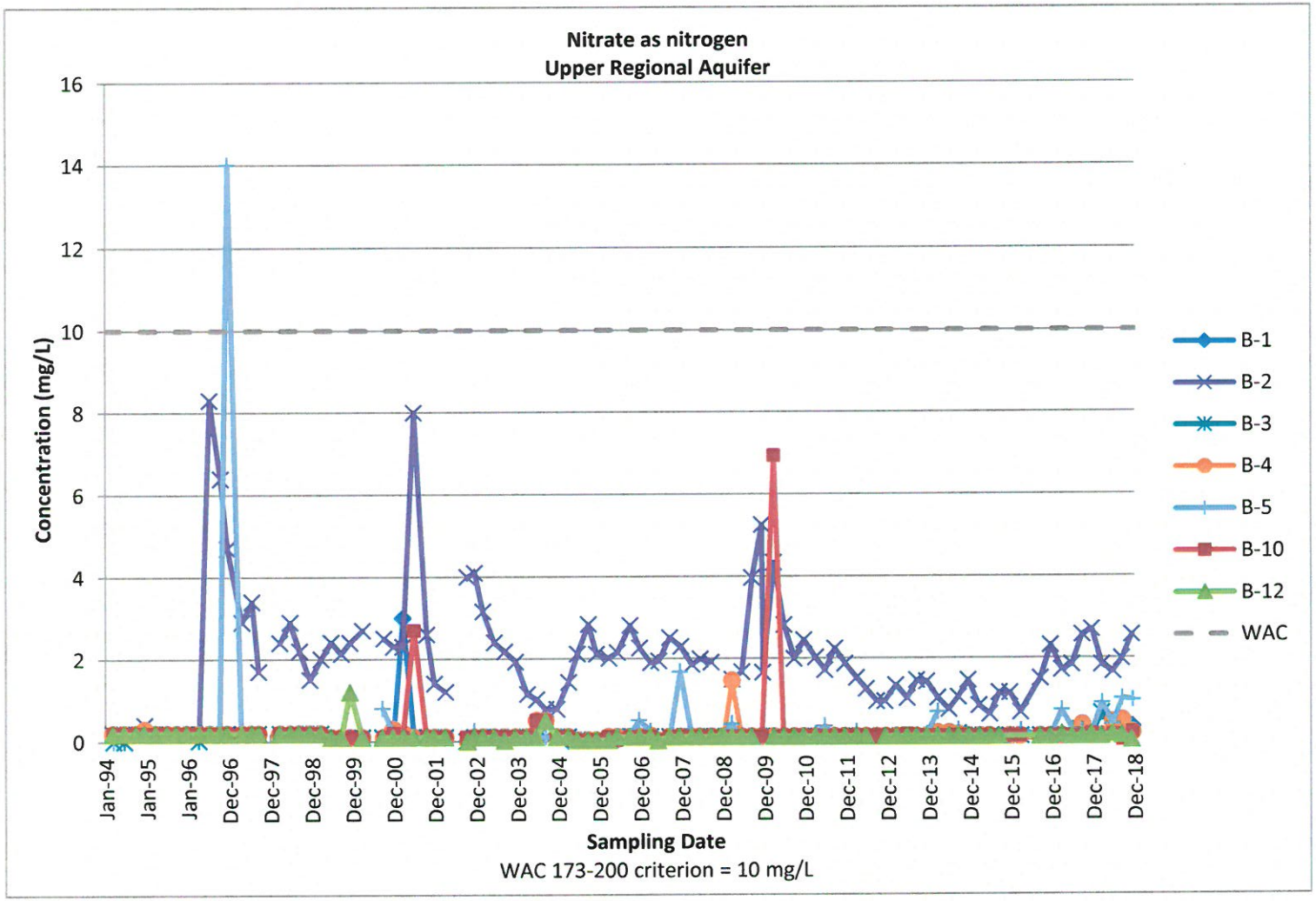

Diethyl ether
Upper Regional Aquifer
Concentration (µg/L)
10
9
8
7
6
5
4
3
2
1
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

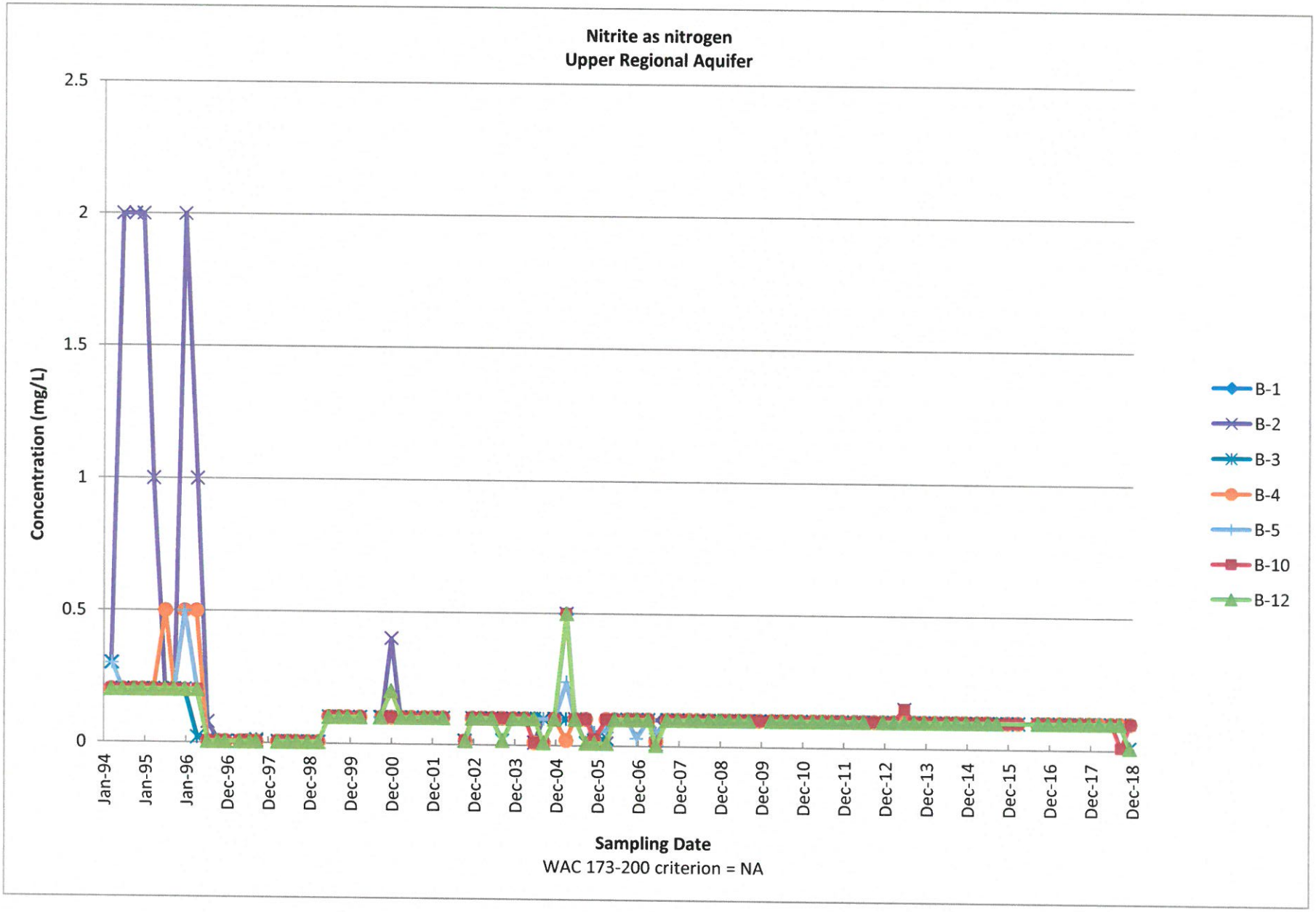

Iron, dissolved
Upper Regional Aquifer
Concentration (mg/L)
40
35
30
25
20
15
10
5
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC
Sampling Date
WAC 173-200 criterion = 0.3 mg/L

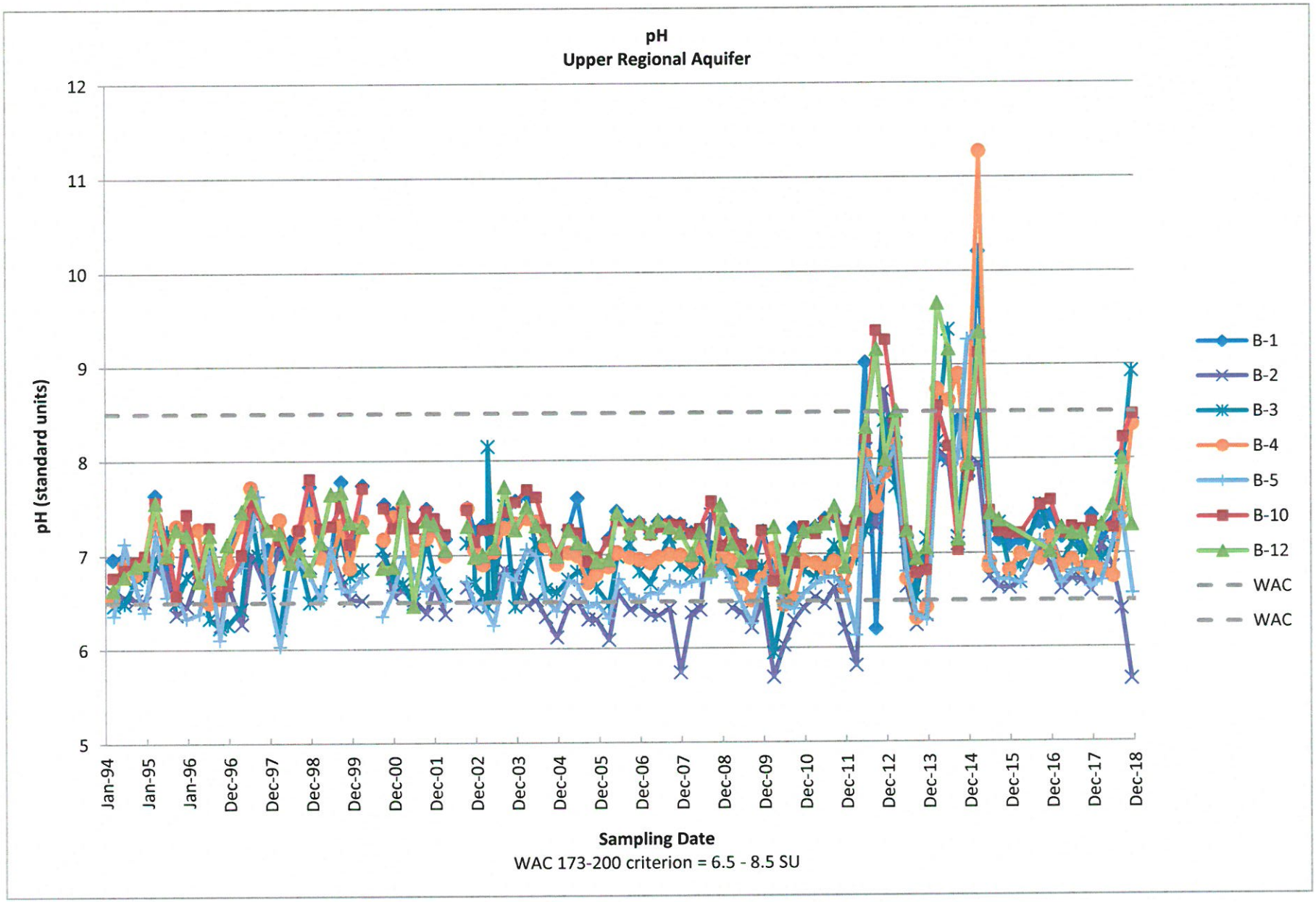

Lead, dissolved
Upper Regional Aquifer
Concentration (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC
WAC 173-200 criterion = 0.05 mg/L

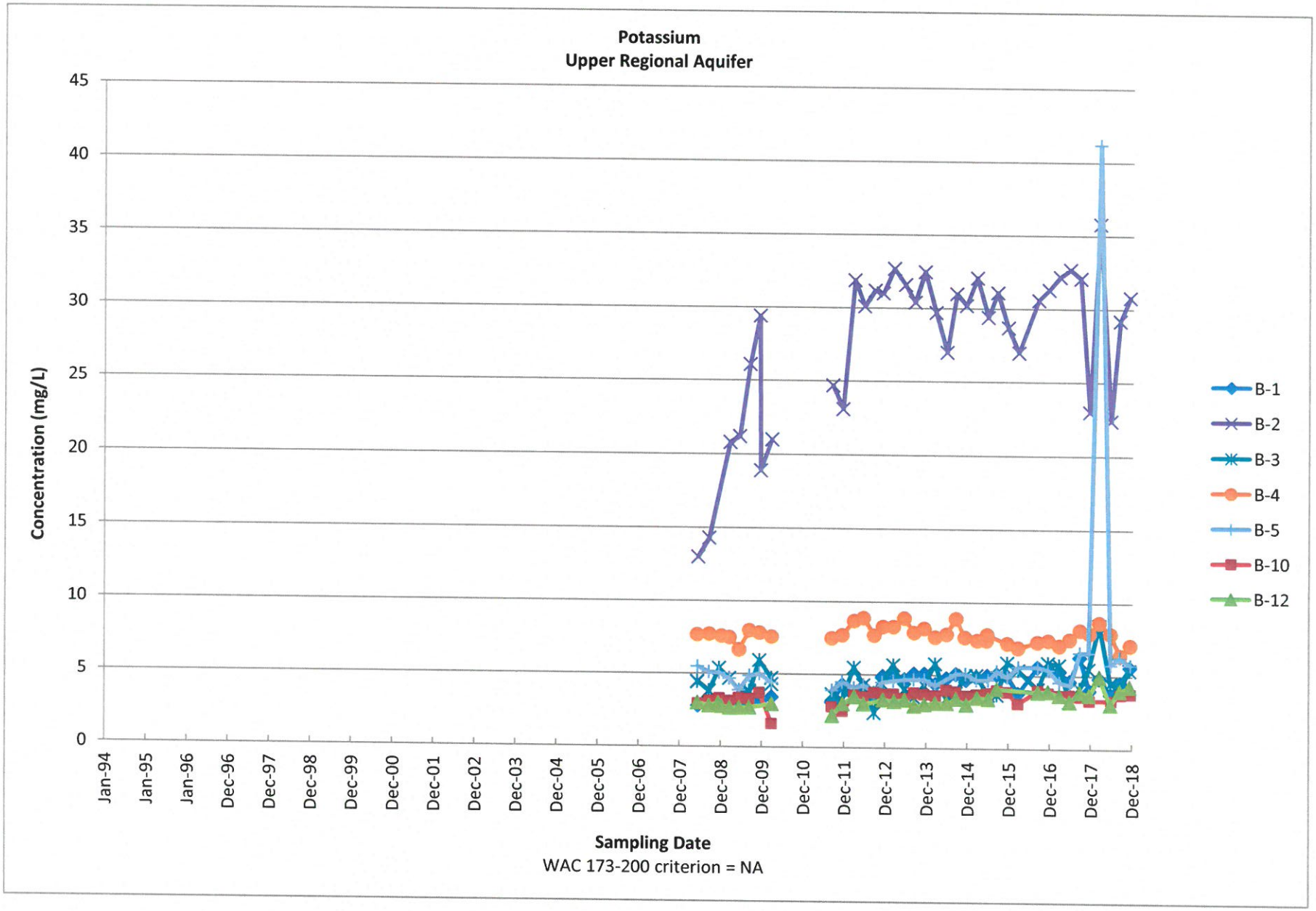

Magnesium
Upper Regional Aquifer
Concentration (mg/L)
140
120
100
80
60
40
20
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

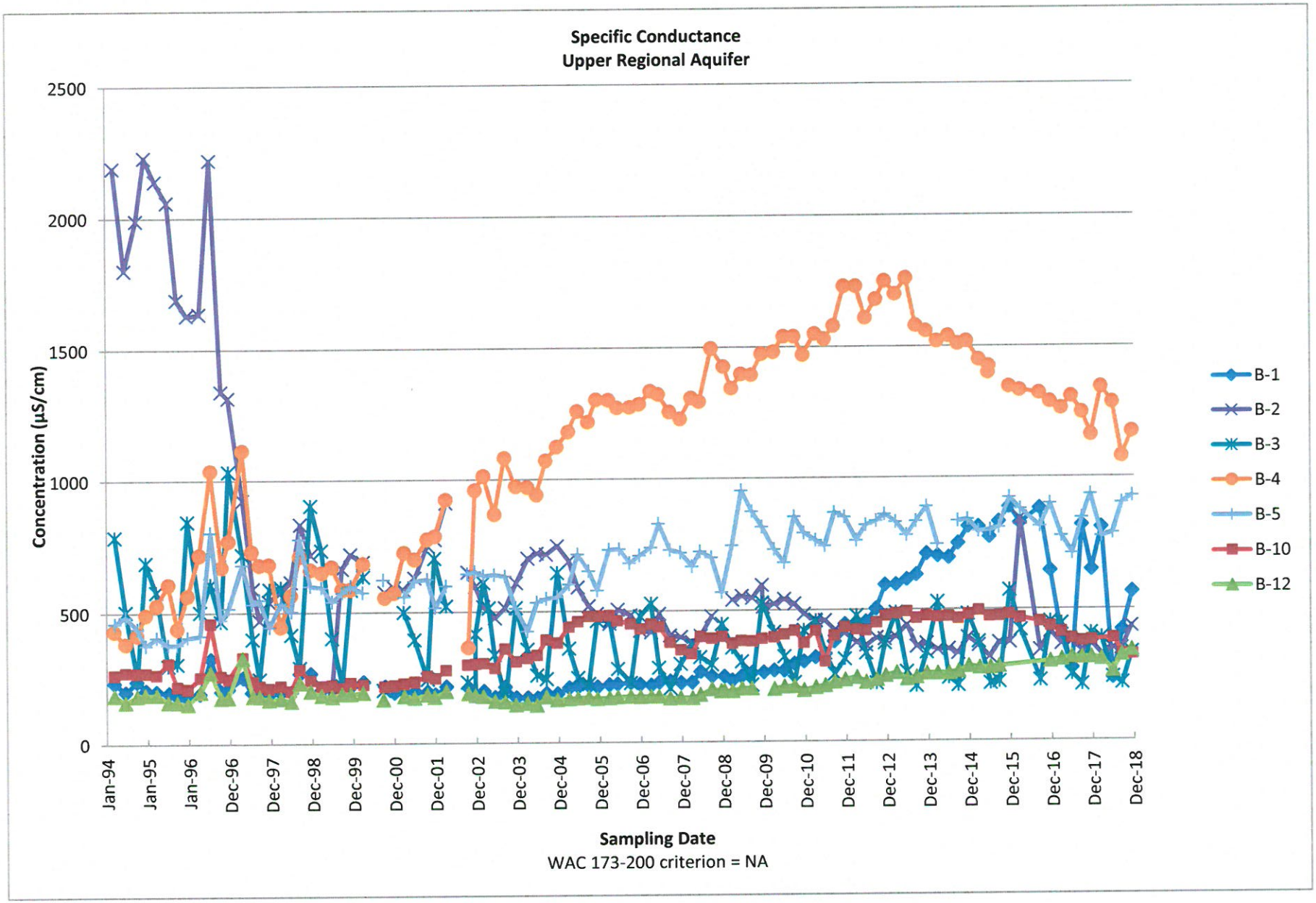

Manganese
Upper Regional Aquifer
Concentration (mg/L)
3.5
3
2.5
2
1.5
1
0.5
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC
Sampling Date
WAC 173-200 criterion = 0.05 mg/L

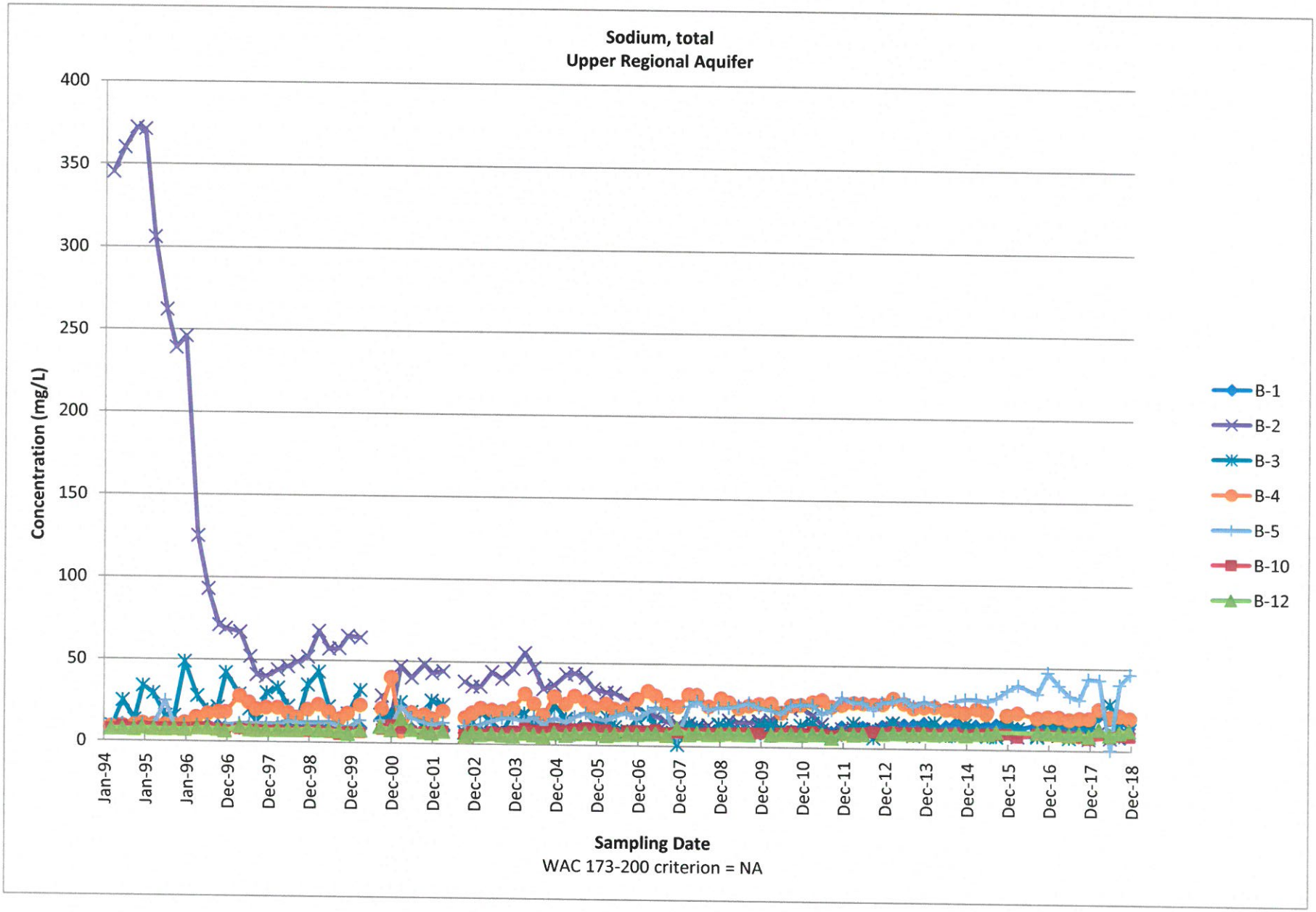

Nitrate as nitrogen
Upper Regional Aquifer
Concentration (mg/L)
16
14
12
10
8
6
4
2
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC
WAC 173-200 criterion = 10 mg/L

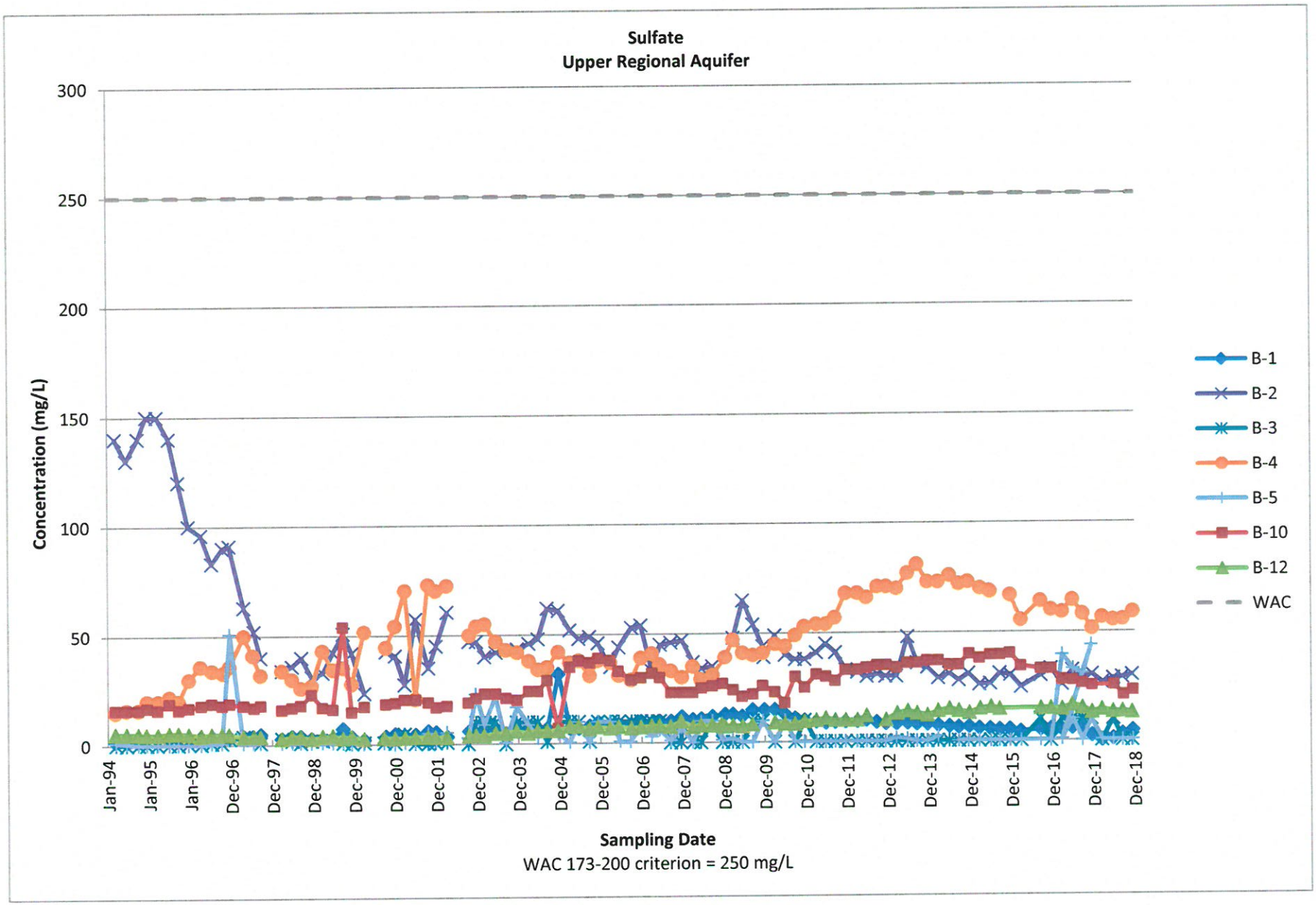

Nitrite as nitrogen
Upper Regional Aquifer
Concentration (mg/L)
2.5
2
1.5
1
0.5
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

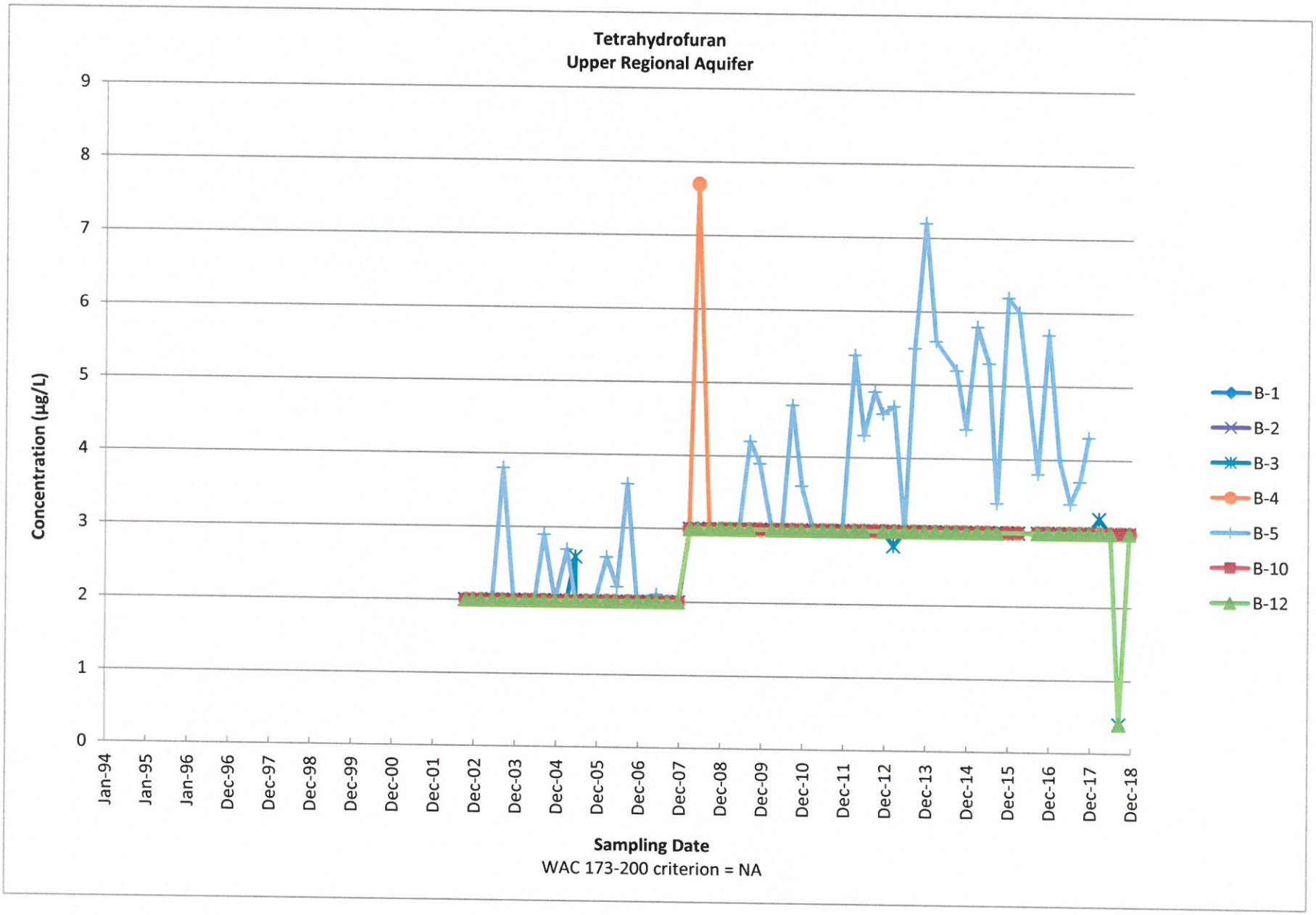

pH
Upper Regional Aquifer
pH (standard units)
12
11
10
9
8
7
6
5
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = 6.5 - 8.5 SU
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC
WAC

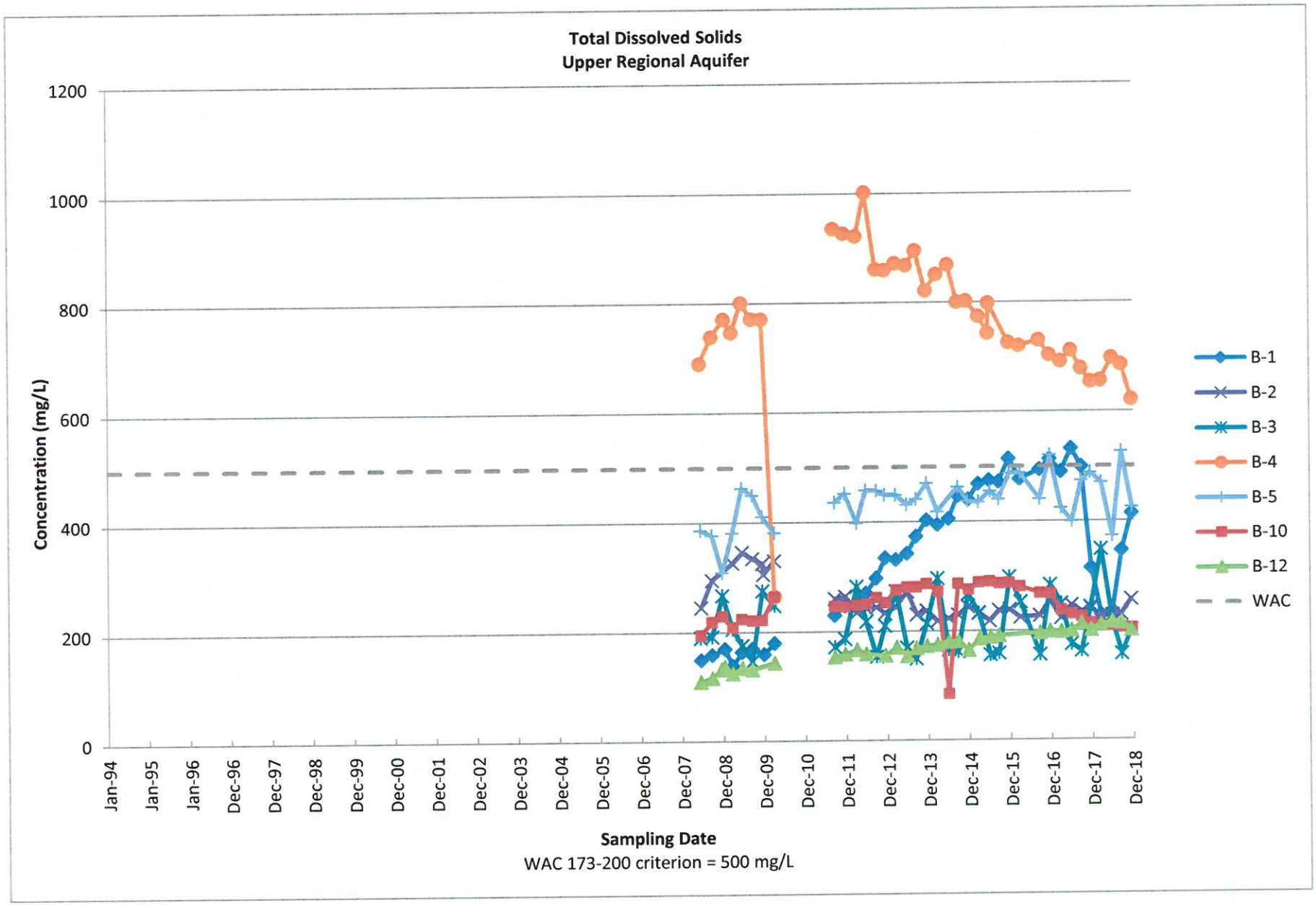

Potassium
Upper Regional Aquifer
Concentration (mg/L)
45
40
35
30
25
20
15
10
5
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

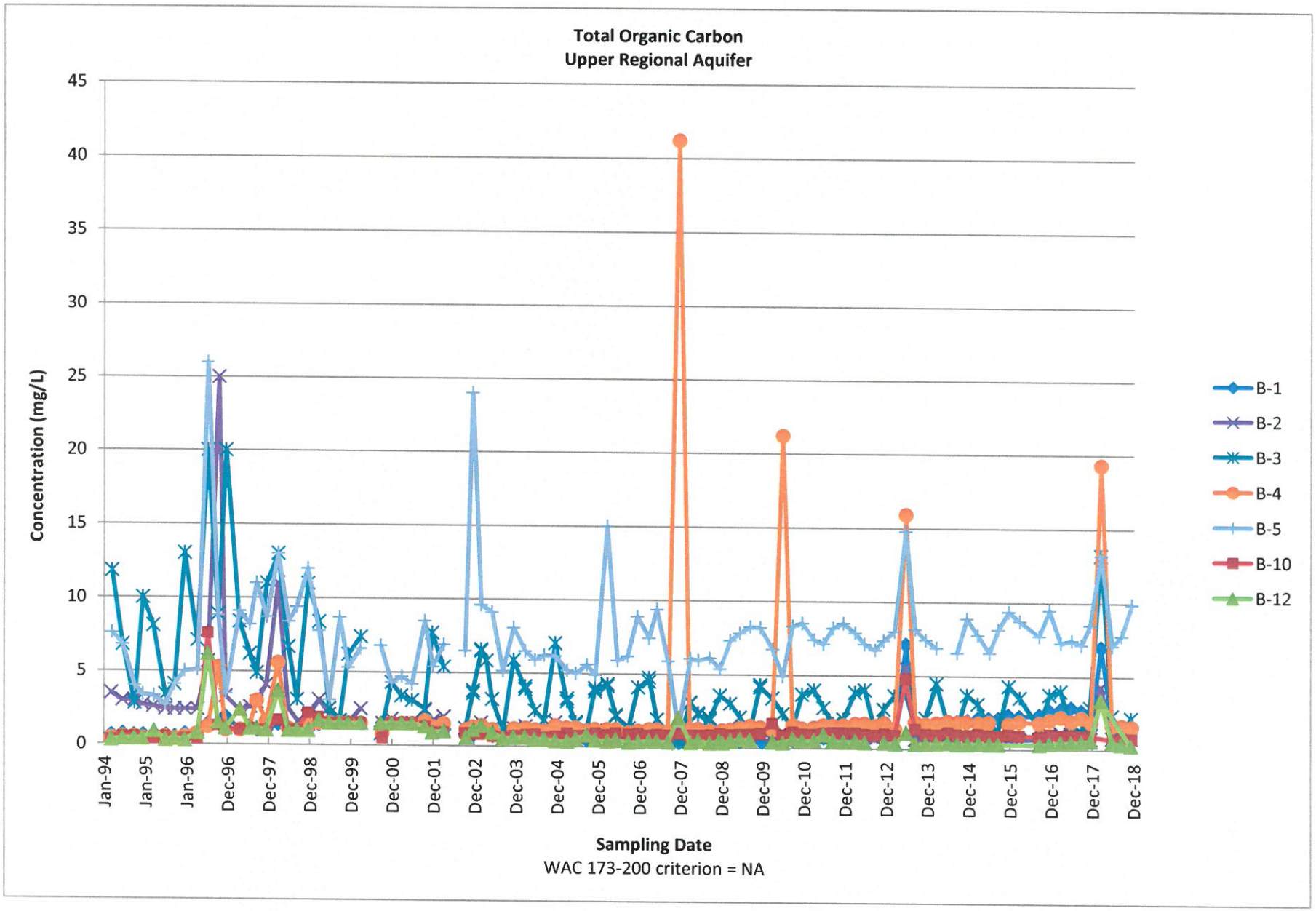

Specific Conductance
Upper Regional Aquifer
Concentration (µS/cm)
2500
2000
1500
1000
500
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

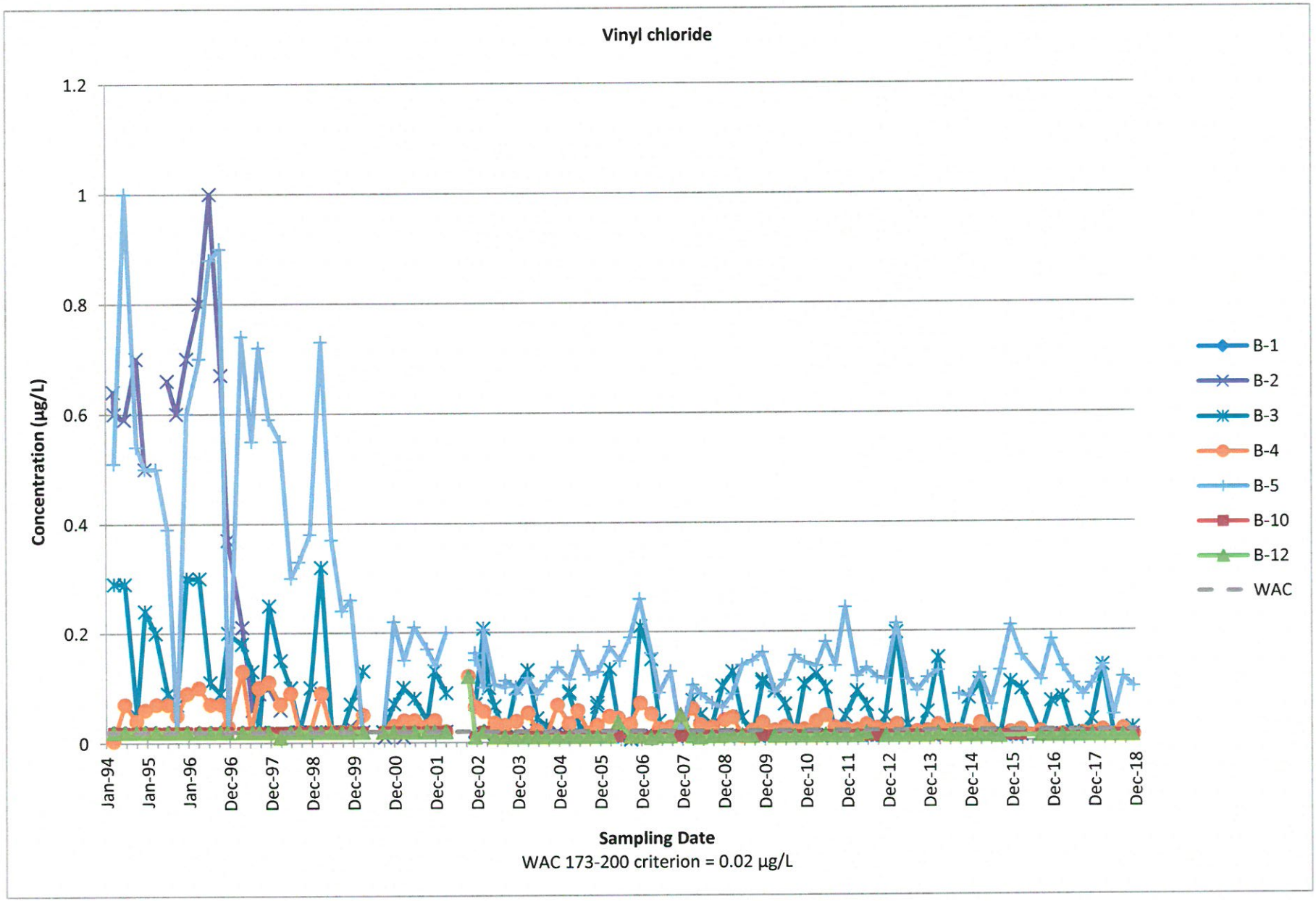

Sodium, total
Upper Regional Aquifer
Concentration (mg/L)
400
350
300
250
200
150
100
50
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12

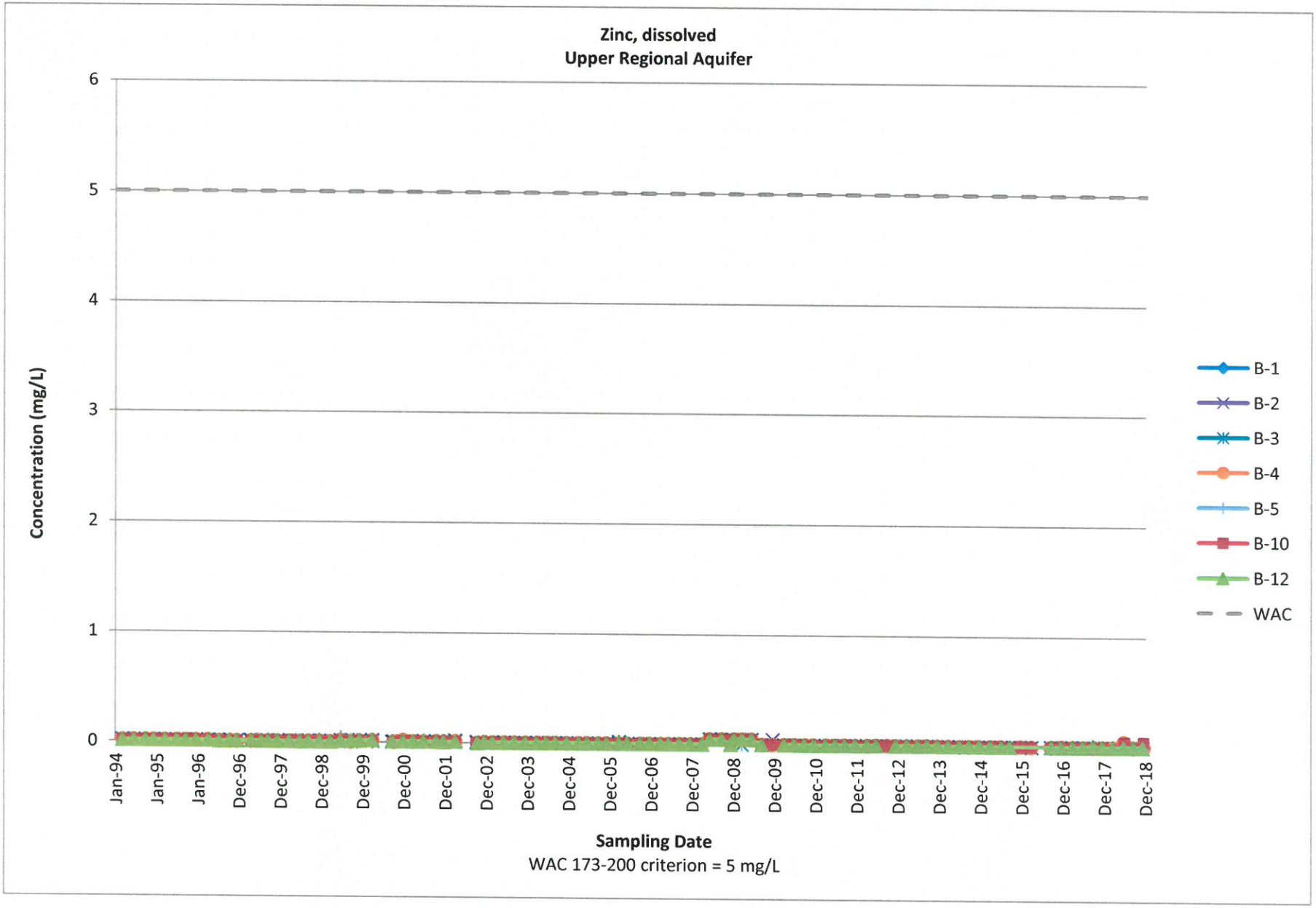

Sulfate
Upper Regional Aquifer
300
250
200
150
100
50
0
Concentration (mg/L)
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = 250 mg/L
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC


Tetrahydrofuran
Upper Regional Aquifer
Concentration (µg/L)
0
1
2
3
4
5
6
7
8
9
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12


Total Dissolved Solids
Upper Regional Aquifer
Concentration (mg/L)
1200
1000
800
600
400
200
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = 500 mg/L
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC


Total Organic Carbon
Upper Regional Aquifer
Concentration (mg/L)
45
40
35
30
25
20
15
10
5
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = NA
B-1
B-2
B-3
B-4
B-5
B-10
B-12


Vinyl chloride
Concentration (µg/L)
1.2
1
0.8
0.6
0.4
0.2
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = 0.02 µg/L
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC


Zinc, dissolved
Upper Regional Aquifer
Concentration (mg/L)
6
5
4
3
2
1
0
Jan-94
Jan-95
Jan-96
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
Dec-14
Dec-15
Dec-16
Dec-17
Dec-18
Sampling Date
WAC 173-200 criterion = 5 mg/L
B-1
B-2
B-3
B-4
B-5
B-10
B-12
WAC

APPENDIX C:
Data Validation Report
Fourth Quarter 2018

INMAN LANDFILL FOURTH QUARTER 2018 MONITORING EVENT
DATA VALIDATION REPORT

1. INTRODUCTION

This report presents the results of data validation for laboratory reports 18-44978, 18-45287, 18-45735, 18-46135, and 18-46337 by Edge Analytical, Burlington, Washington. Sample identifications and the analyses requested are provided in the following table.

Sample Location	Skagit County Sample ID	Lab Sample ID	Lab Report	Analysis (All Samples)
B-1	2927	93242	18-45735	Dissolved Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Hg, Mn, Ni, Pb, Se, Vd, Zn: 200.7/Filter, 200.8/Filter, 245.1/Filter Total Metals (Ca, K, Mg, Na): 200.7 Inorganic Anions (NO_3, NO_2, Cl, SO_4): 300.0 Nutrients (NH_3): SM 4500 Demand (TOC, COD): SM 5310B, SM 5220D Organics (VOCs): 8260B, 8260SIM Properties (Alkalinity, TDS, Bicarbonate): SM 2320B, SM 2540C
B-2	2928	91698	18-44978	
B-3	2929	92335	18-45287	
B-3 Duplicate	2930	92336	18-45287	
B-4	2931	94342	18-46135	
B-5	2932	94812	18-46337	
B-6	2933	93243	18-45735	
B-9	2935	94343	18-46135	
B-10	2936	94813	18-46337	
B-12	2937	92337	18-45287	

The samples were collected on December 4, 5, 10, 12, and 13, 2018.

2. SAMPLE HANDLING AND CUSTODY REQUIREMENTS

Samples were transported off site for analysis. Custody of the samples was controlled and documented on a chain of custody form. Unique sample identification numbers were recorded on the chain of custody forms along with date, time, matrix type, preservative, analysis required for each sample, and other required information.

2.1 Dissolved Metals

Sample custody was maintained throughout collection, transport, and lab receipt.

2.2 Total Metals

Sample custody was maintained throughout collection, transport, and lab receipt.

2.3 Inorganic Anions

Sample custody was maintained throughout collection, transport, and lab receipt.

2.4 Nutrients

Sample custody was maintained throughout collection, transport, and lab receipt.

2.5 Demand

Sample custody was maintained throughout collection, transport, and lab receipt.

2.6 Organics

Sample custody was maintained throughout collection, transport, and lab receipt.

2.7 Properties

Sample custody was maintained throughout collection, transport, and lab receipt.

3. HOLDING TIME

3.1 Dissolved Metals

All analyses were performed within the recommended maximum holding time.

3.2 Total Metals

All analyses were performed within the recommended maximum holding time.

3.3 Inorganic Anions

All analyses were performed within the recommended maximum holding time.

3.4 Nutrients

All analyses were performed within the recommended maximum holding time.

3.5 Demand

All analyses were performed within the recommended maximum holding time.

3.6 Organics

All analyses were performed within the recommended maximum holding time.

3.7 Properties

All analyses were performed within the recommended maximum holding time.

4. METHOD BLANKS

The assessment of blank analysis results is to determine the existence and magnitude of contamination resulting from laboratory activities.

4.1 Dissolved Metals

Goals for blank analyses were met. Method blanks were analyzed and were target analyte free.

4.2 Total Metals

Goals for blank analyses were met. Method blanks were analyzed and were target analyte free.

4.3 Inorganic Anions

No method blanks were analyzed for inorganic anions.

4.4 Nutrients

Goals for blank analyses were met. Method blanks were analyzed and were target analyte free.

4.5 Demand

Goals for blank analyses were met. Method blanks were analyzed and were target analyte free.

4.6 Organics

Goals for blank analyses were met. Method blanks were analyzed and were target analyte free.

4.7 Properties

Goals for blank analyses were met. Method blanks were analyzed and were target analyte free.

5. LABORATORY FORTIFIED BLANK

Data for laboratory control samples (LCS) were provided in order to evaluate the accuracy and performance of the analytical method. GC and GC/MS method performance on individual samples is established by means of spiking system monitoring compounds (surrogates), and internal standards which are added just prior to analyses.

5.1 Dissolved Metals

Goals for LCS recovery were met.

5.2 Total Metals

Goals for LCS recovery were met.

5.3 Inorganic Anions

Goals for LCS recovery were met.

5.4 Nutrients

Goals for LCS recovery were met.

5.5 Demand

Goals for LCS recovery were met.

5.6 Organics

Goals for LCS recovery were met.

5.7 Properties

Goals for LCS recovery were met.

6. LABORATORY DUPLICATE PRECISION

6.1 Dissolved Metals

The RPD values for duplicate analyses performed on dissolved metal samples were within acceptable limits.

6.2 Total Metals

The RPD values for duplicate analyses performed on total metal samples were within acceptable limits.

6.3 Inorganic Anions

The RPD values for duplicate analyses performed on inorganic anion samples were within acceptable limits.

6.4 Nutrients

The RPD values for duplicate analyses performed on nutrient samples were within acceptable limits.

6.5 Demand

The RPD values for duplicate analyses performed on demand samples were within acceptable limits.

6.6 Organics

The RPD values for duplicate analyses performed on organic samples were within acceptable limits.

6.7 Properties

The RPD values for duplicate analyses performed on organic samples were within acceptable limits.

7. MATRIX SPIKE AND MATRIX SPIKE DUPLICATE ANALYSIS

7.1 Dissolved Metals

The matrix spike and matrix spike duplicate (MS/MSD) analyses were in control for all recoveries.

7.2 Total Metals

The matrix spike and matrix spike duplicate (MS/MSD) analyses were in control for all recoveries.

7.3 Inorganic Anions

The matrix spike and matrix spike duplicate (MS/MSD) analyses were in control for all other recoveries.

7.4 Nutrients

The RPD for Ammonia-N was above the upper limit of 20%. The sample was flagged as non-homogeneous and no further action taken. The MS/MSD analyses performed on the nutrient samples were in control for all other recoveries and RPDs.

7.5 Demand

The MS/MSD analyses performed on the demand samples were in control for all recoveries and RPDs.

7.6 Organics

The MS/MSD analyses performed on the organic samples were in control for all recoveries and RPDs.

7.7 Properties

The MS/MSD analyses performed on other samples were in control for all recoveries and RPDs.

8. FIELD DUPLICATE

Analyte	Field Duplicate		
	B-3 (2929)	B-3 Duplicate (2930)	RPD (%)
Dissolved Metals (mg/L)			
Arsenic	0.0023	0.0024	4.3
Barium	0.094	0.099	5.2
Iron	5.31	5.59	5.1
Manganese	0.62	0.64	3.2
Nickel	0.0008	0.0009	11.8
Vanadium	0.0007	0.0007	0.0
Total Metals (mg/L)			
Calcium	26.0	23.0	12.2
Magnesium	17.3	15.6	10.3
Potassium	5.41	4.94	9.1
Sodium	15.4	12.3	22.4
Inorganic Anions (mg/L)			
Chloride	12.0	11.5	4.3
Nutrients (mg/L)			
Ammonia	0.99	1.00	1.0
Demand (mg/L)			
Total organic carbon	2.20	2.09	5.1
Properties (mg/L)			
Alkalinity	133	131	1.5
Bicarbonate	151.3	149.9	0.9
Total dissolved solids	201	209	3.9

Bold = Relative Percent Difference (RPD) exceeds 20% acceptance criteria
Non-detects are not shown.

8.1 Dissolved Metals

All RPDs between the duplicate samples were within ≤ 20%.

8.2 Total Metals

The RPD for Sodium was 22.4% above the 20% criteria. Since sodium does not have a groundwater quality standard and the RPDs wasn't too above the limit of 20%, the difference is not considered significant and no further action will be taken on this data set. All RPDs between all other the duplicate samples were within ≤ 20%.

8.3 Inorganic Anions

All RPDs between the duplicate samples were within ≤ 20%.

8.4 Nutrients

All RPDs between the duplicate samples were within ≤ 20%.

8.5 Demand

All RPDs between the duplicate samples were within ≤ 20%.

8.6 Organics

All RPDs between the duplicate samples were within ≤ 20%.

8.7 Properties

All RPDs between the duplicate samples were within ≤ 20%.

9. DETECTION LIMITS

If detection limit goals are met, then the analytic method is considered to have provided detection limits low enough to allow site data to be compared to the applicable groundwater criteria.

9.1 Dissolved Metals – 200.8/Filter, 245.1/Filter

Detection limit goals were met for all results.

9.2 Total Metals – 200.7

Detection limit goals were met for all results.

9.3 Inorganic Anions – 300.0

Detection limit goals were met for all results.

9.4 Nutrients – SM 4500

Detection limit goals were met for all results.

9.5 Demand – SM 5310B, SM 5220D

Detection limit goals were met for all results.

9.6 Organics – 8260B, 8260SIM

Detection limit goals were met for all results.

9.7 Properties – SM2320 B, SM2540 C

Detection limit goals were met for all results.

10. DATA VALIDATION AND USABILITY

With the exception of the above noted anomalies, standard analytical protocols were followed in the analysis of the samples and all laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits. Limitations were stated and clearly identified where applicable. As a result of this review, the data are found to be acceptable as reported by the laboratory for the intended use in this project.

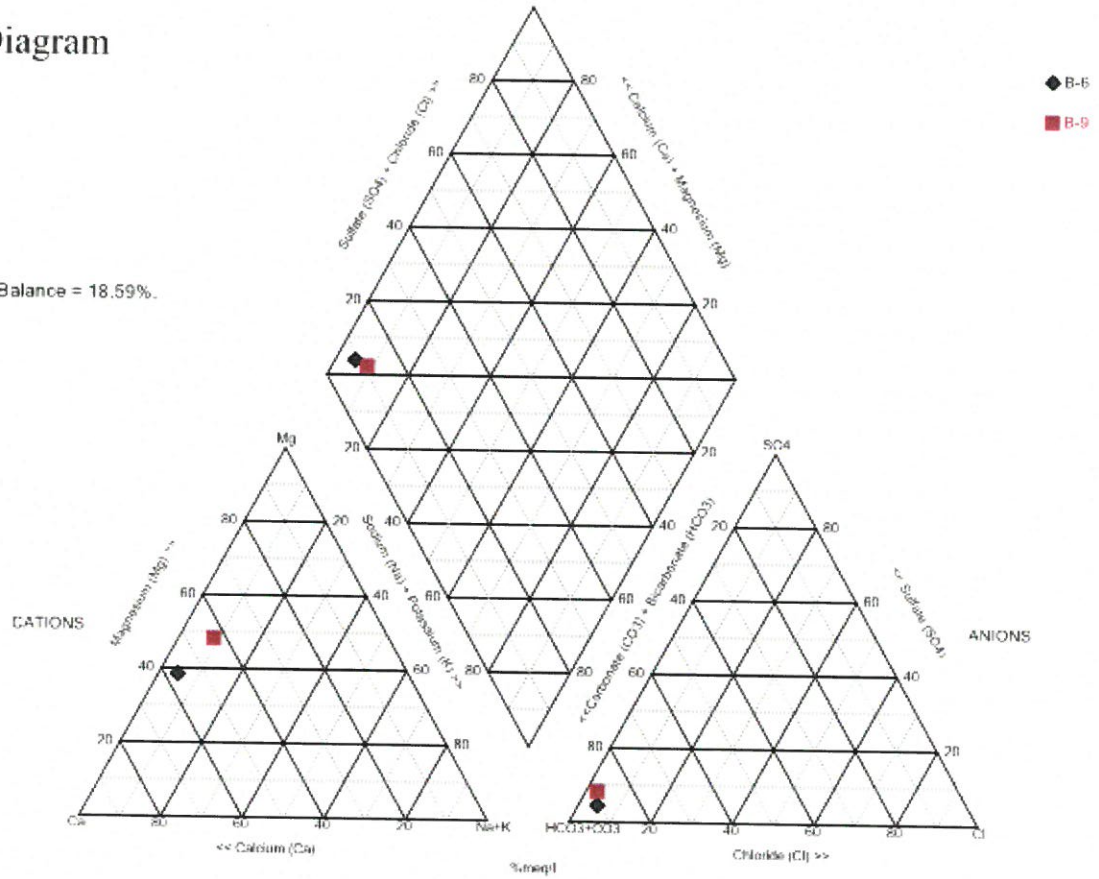
APPENDIX D-1:
Piper Diagrams 2018 – Perched Aquifer

WQStat Plus™ v.9.4.41

Piper Diagram

3/13/2018

Cation-Anion Balance = 18.59%.

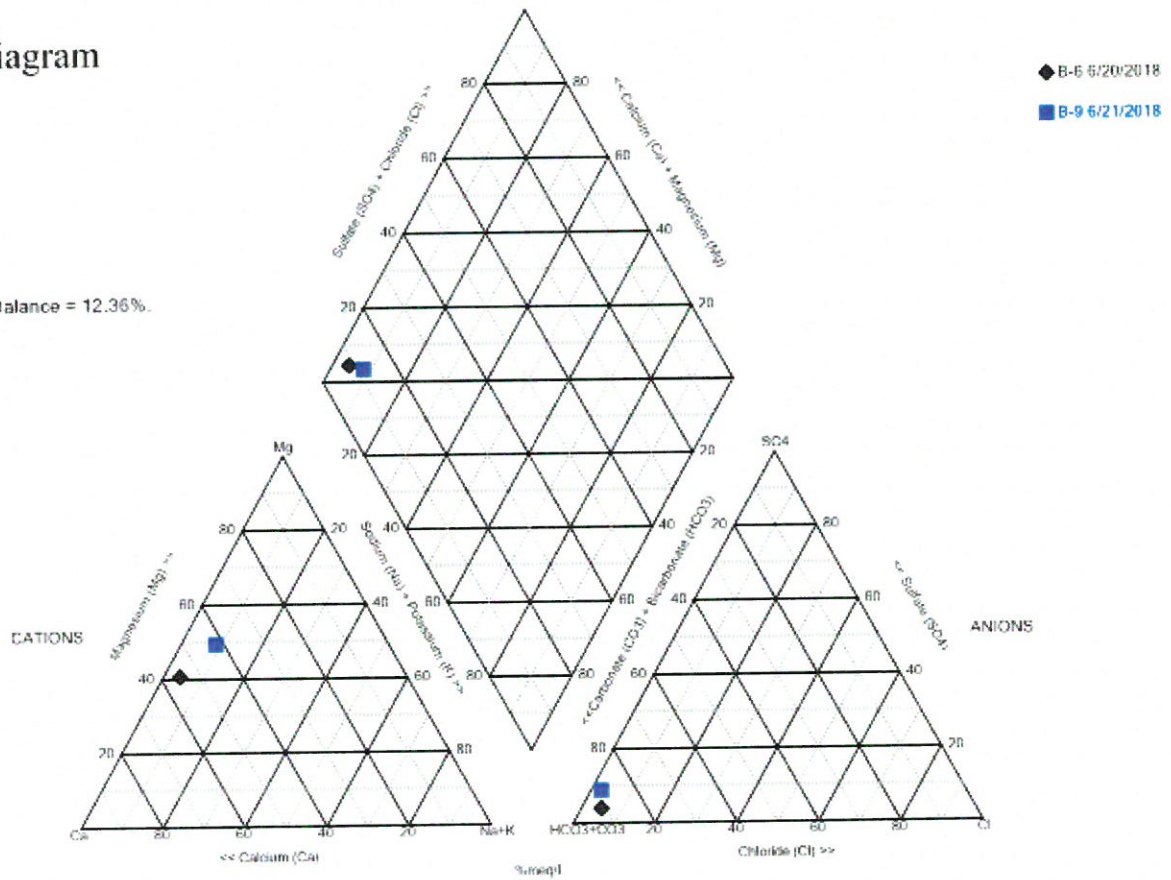


Analysis Run 3/4/2019 2:23 PM

Facility: inman landfill Data File: inman perched organic results (1995-2018)

WQStat Plus™ v.9.4.41

Piper Diagram



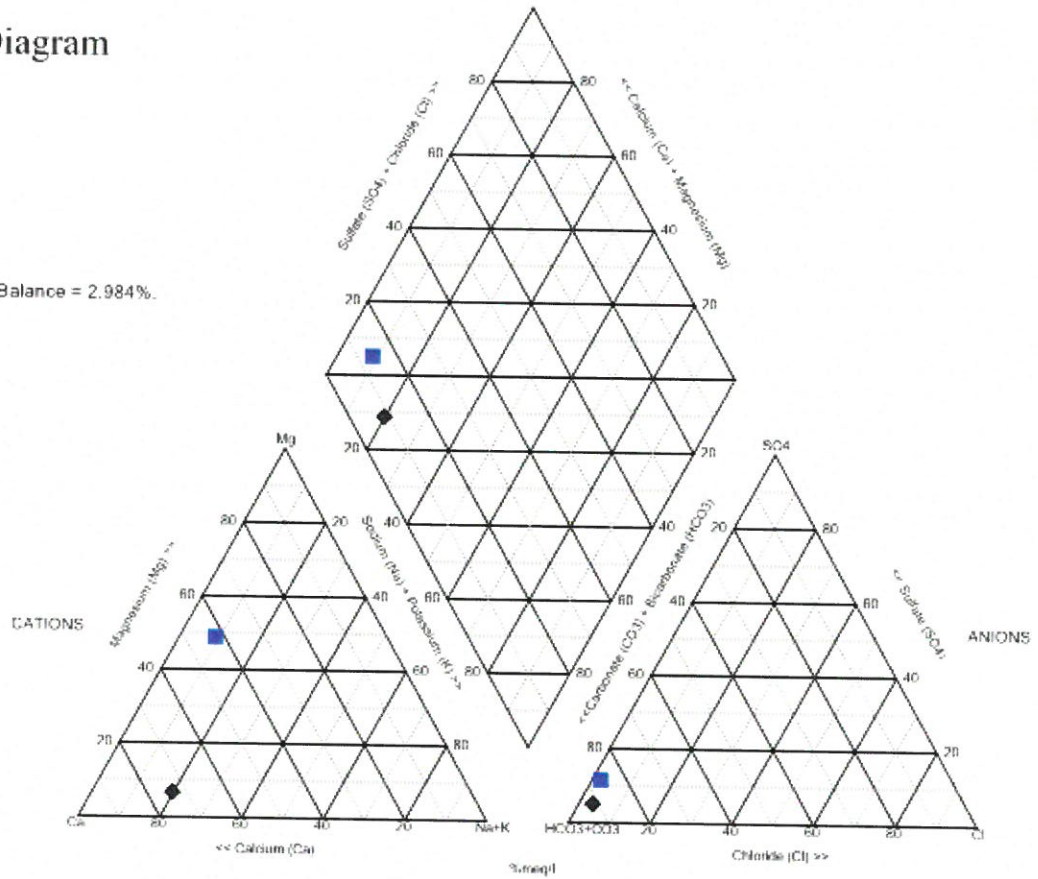
Analysis Run 3/4/2019 2:25 PM

Facility: inman landfill Data File: inman perched organic results (1995-2018)

WQStat Plus™ v.9.4.41

Piper Diagram

Cation-Anion Balance = 2.984%.

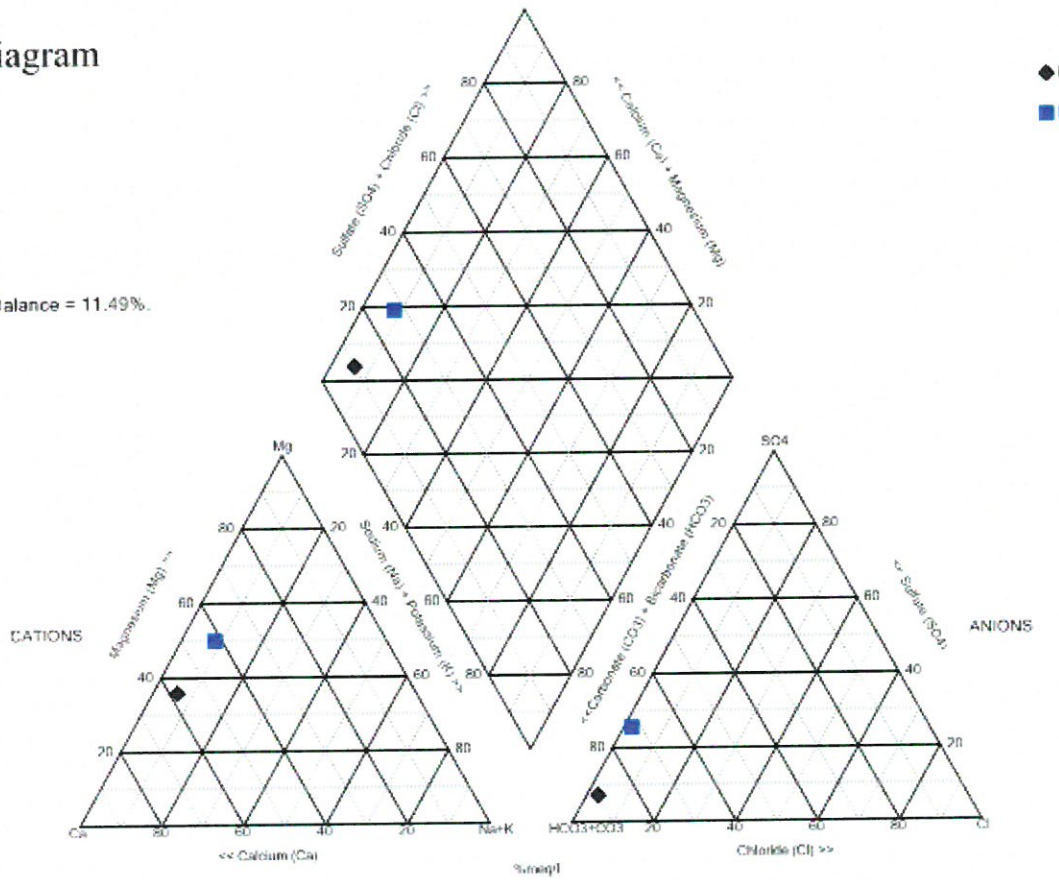


Analysis Run 3/4/2019 2:27 PM

Facility: inman landfill Data File: inman perched organic results (1995-2018)

WQStat Plus™ v.9.4.41

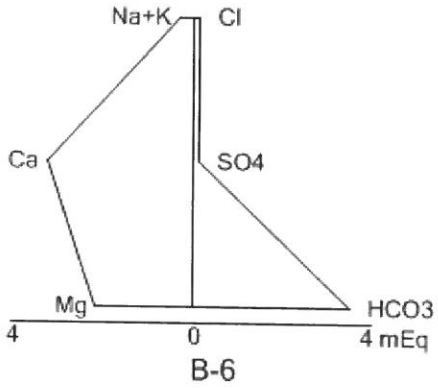
Piper Diagram



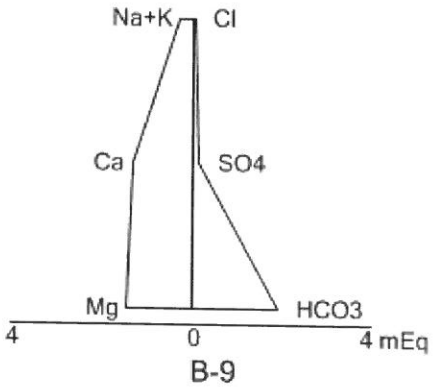
Analysis Run 3/4/2019 2:27 PM

Facility: inman landfill Data File: inman perched organic results (1995-2018)

APPENDIX D-2:
Stiff Diagrams 2018 – Perched Aquifer



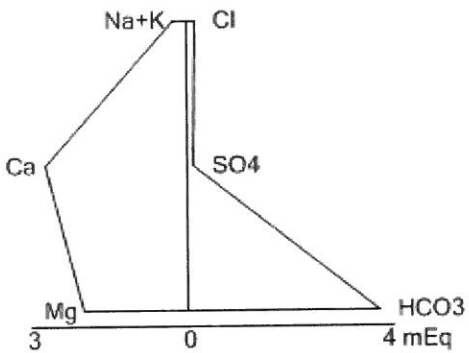
B-6



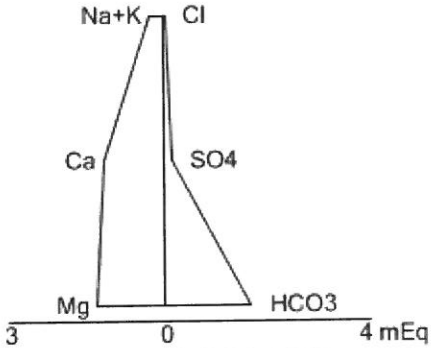
B-9

Stiff Diagram - 3/13/2018 Analysis Run 3/4/2019 2:30 PM

Facility: inman landfill Data File: inman perched organic results (1995-2018)



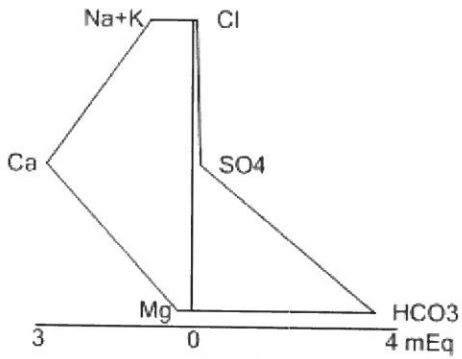
B-6 6/20/2018



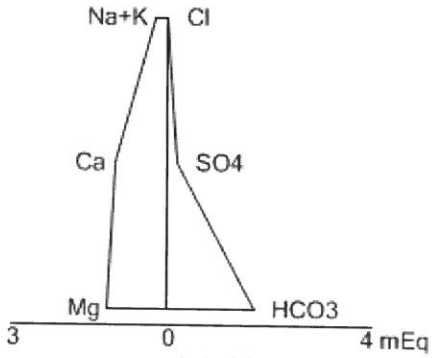
B-9 6/21/2018

Stiff Diagram Analysis Run 3/4/2019 2:31 PM

Facility: inman landfill Data File: inman perched organic results (1995-2018)



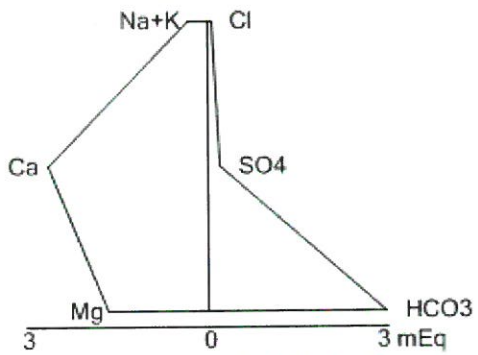
B-6 9/11/2018



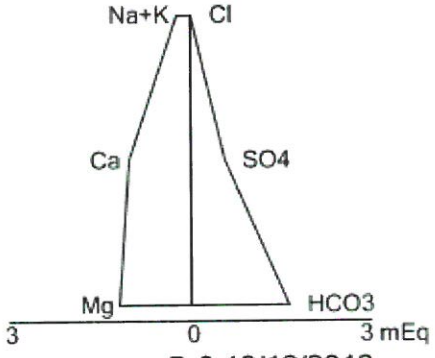
B-9 9/12/2018

Stiff Diagram Analysis Run 3/4/2019 2:34 PM

Facility: inman landfill Data File: inman perched organic results (1995-2018)



B-6 12/10/2018

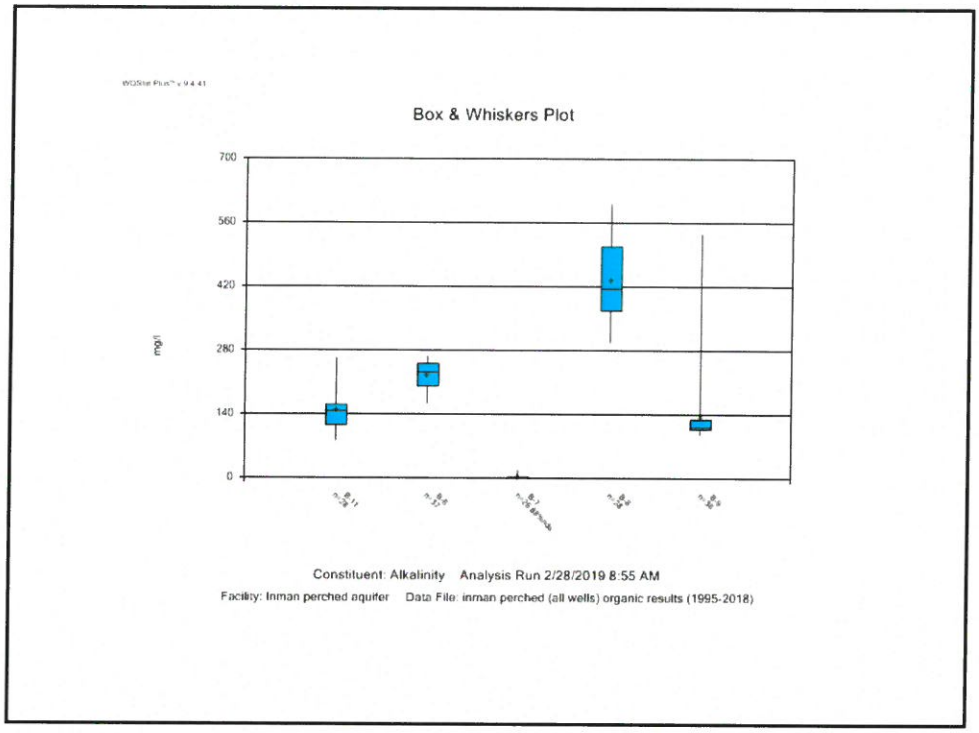


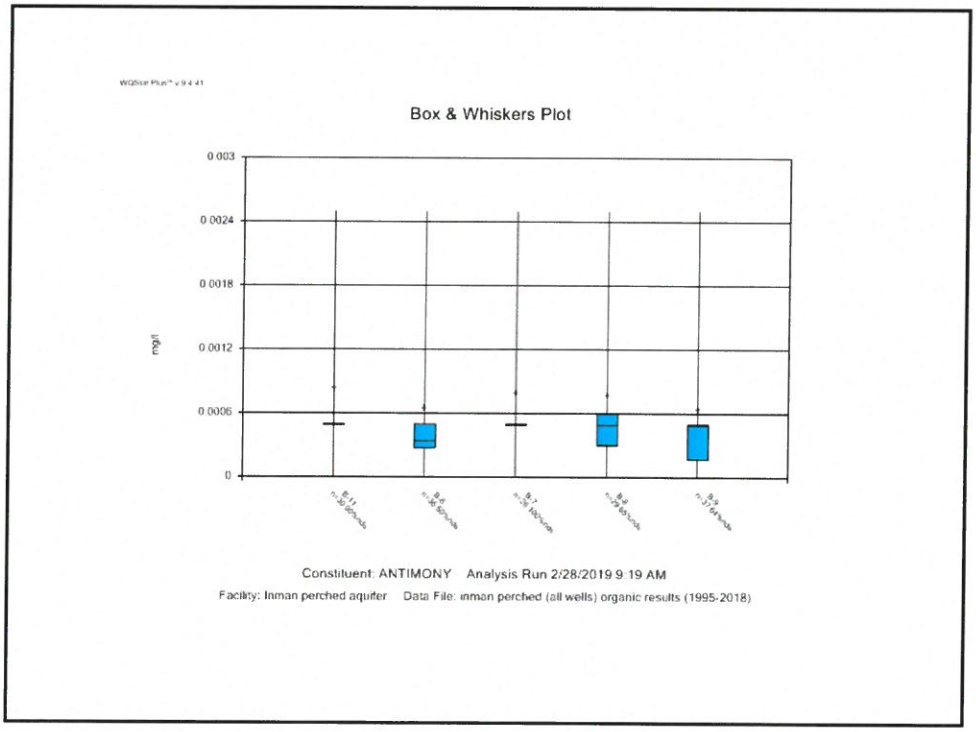
B-9 12/12/2018

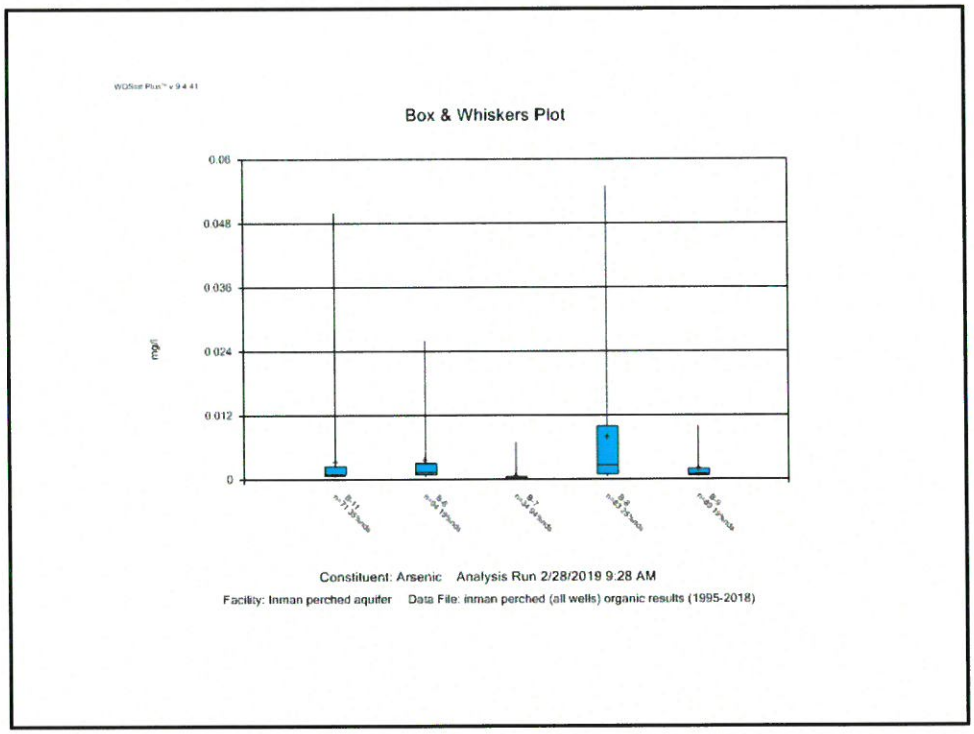
Stiff Diagram Analysis Run 3/4/2019 2:34 PM

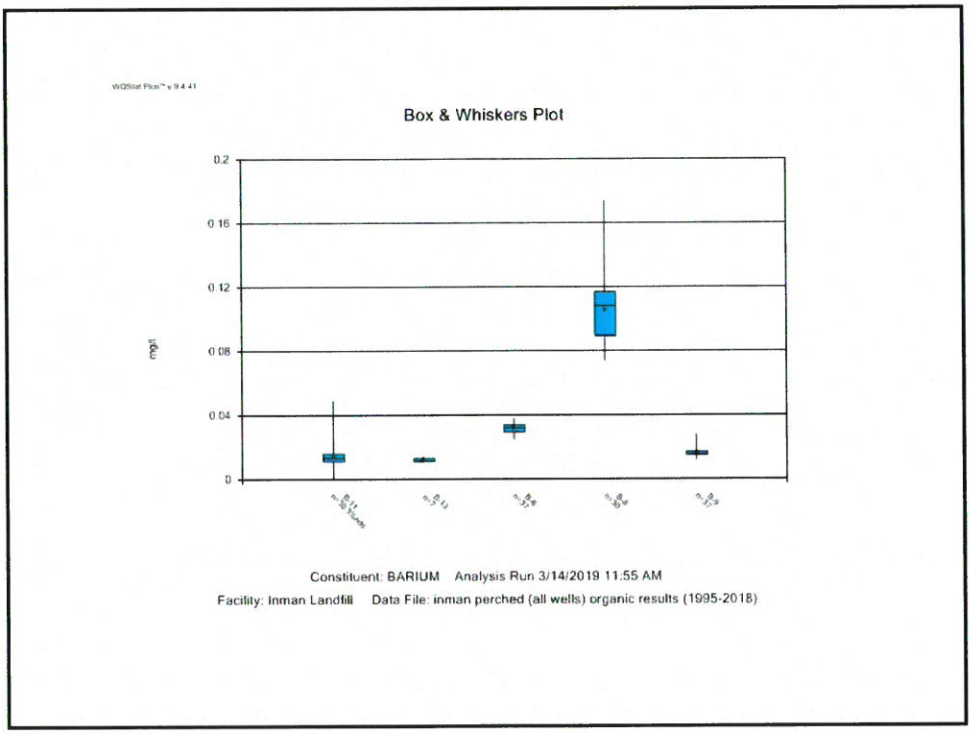
Facility: inman landfill Data File: inman perched organic results (1995-2018)

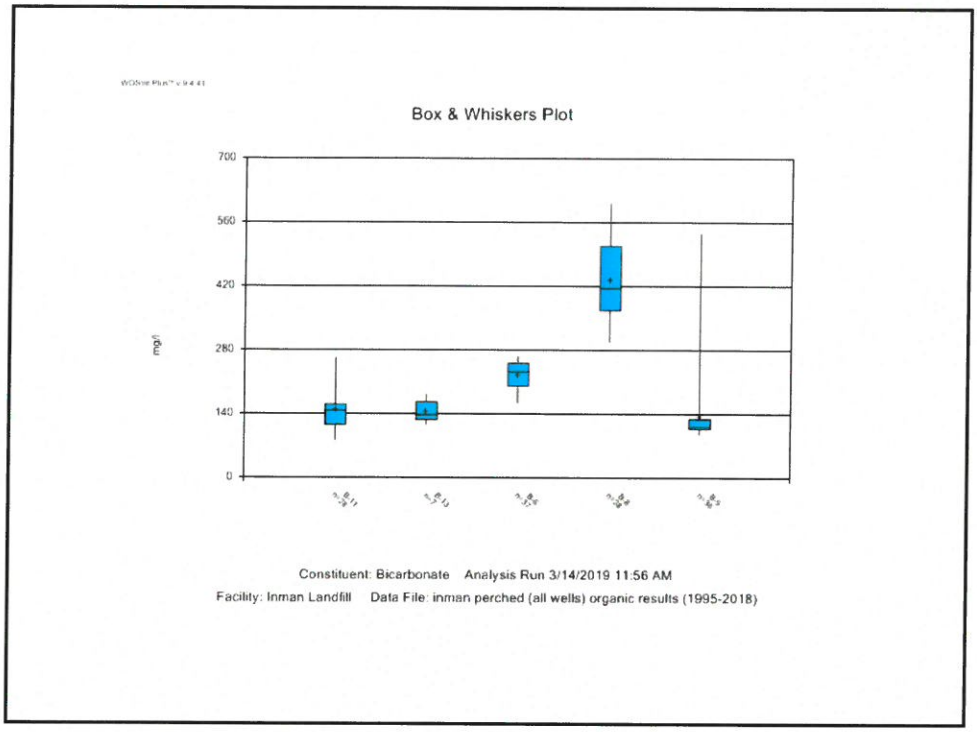
APPENDIX D-3:
Box Plots 1994-2018 – Perched Aquifer

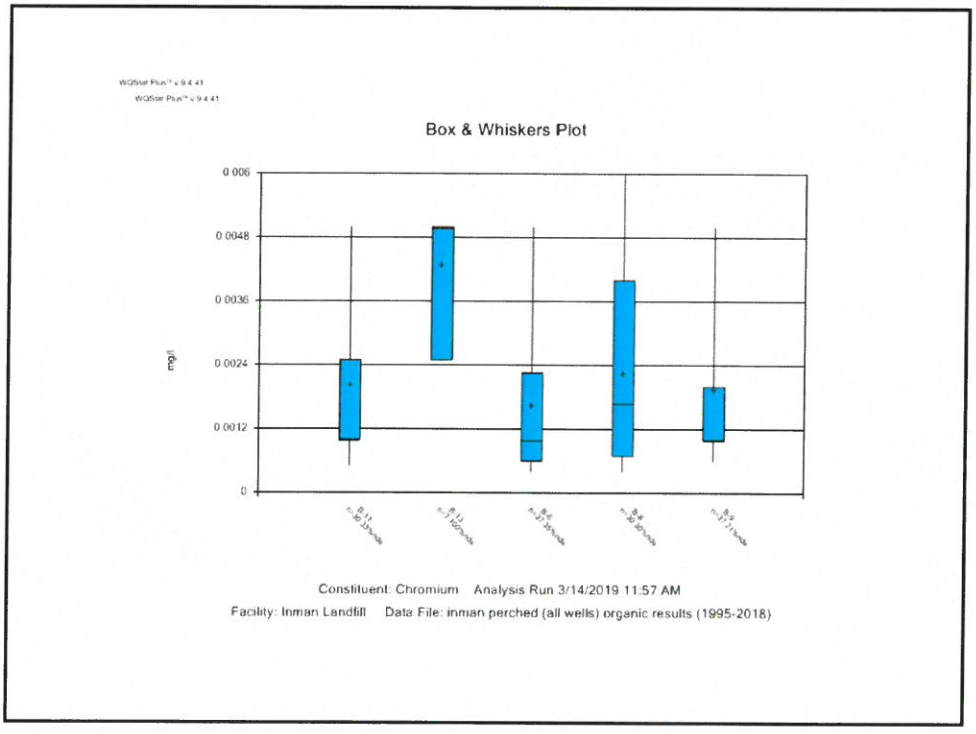

Box & Whiskers Plot
700
560
420
280
140
0
mg/l
Constituent: Alkalinity Analysis Run 2/28/2019 8:55 AM
Facility: Inman perched aquifer Data File: inman perched (all wells) organic results (1995-2018)

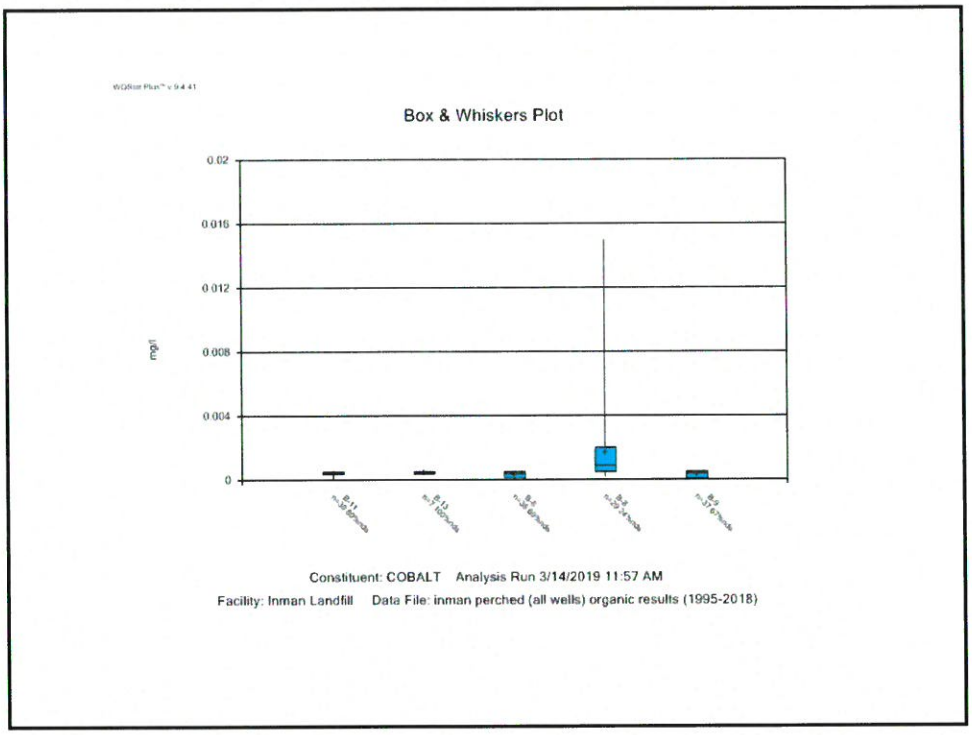

Box & Whiskers Plot
0.003
0.0024
0.0018
0.0012
0.0006
0
mg/l
Constituent: ANTIMONY Analysis Run 2/28/2019 9:19 AM
Facility: Inman perched aquifer Data File: inman perched (all wells) organic results (1995-2018)

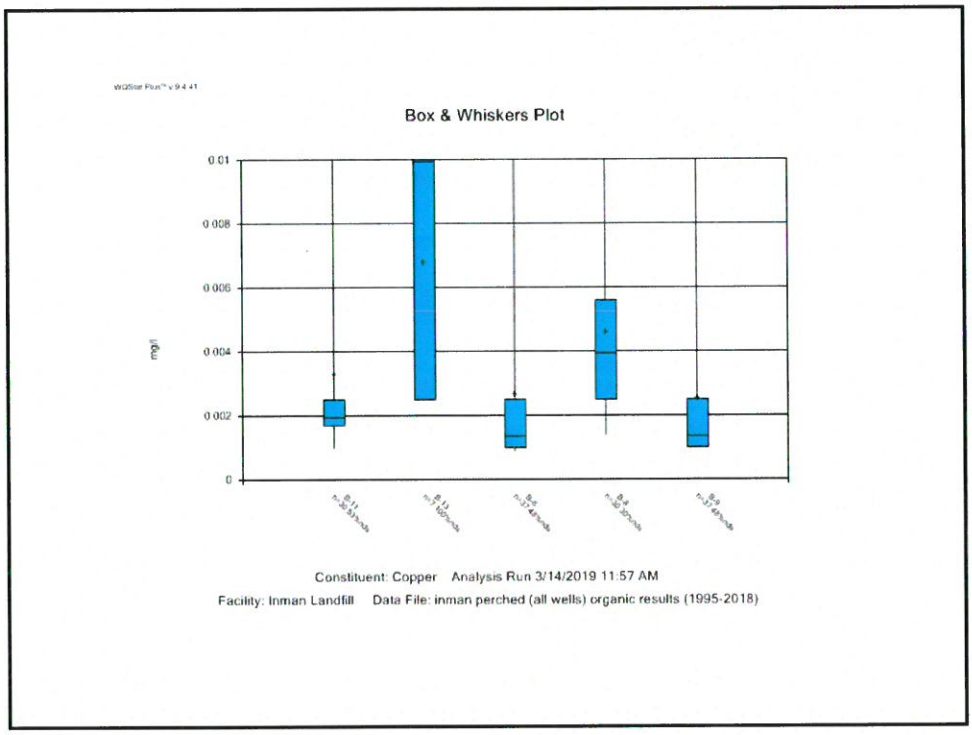

WQStat Plus™ v 9.4.41
Box & Whiskers Plot
0.06
0.048
0.036
0.024
0.012
0
mg/l
Constituent: Arsenic Analysis Run 2/28/2019 9:28 AM
Facility: Inman perched aquifer Data File: inman perched (all wells) organic results (1995-2018)

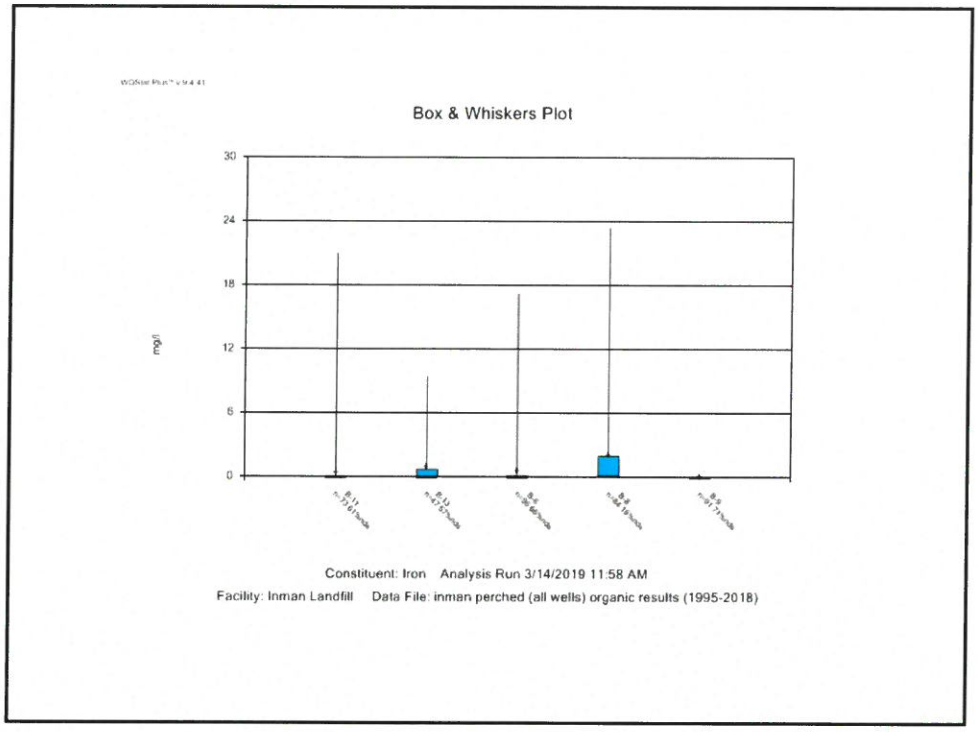

WQStat Plus™ v 9.4.41
Box & Whiskers Plot
0.2
0.16
0.12
0.08
0.04
0
mg/l
Constituent: BARIUM Analysis Run 3/14/2019 11:55 AM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

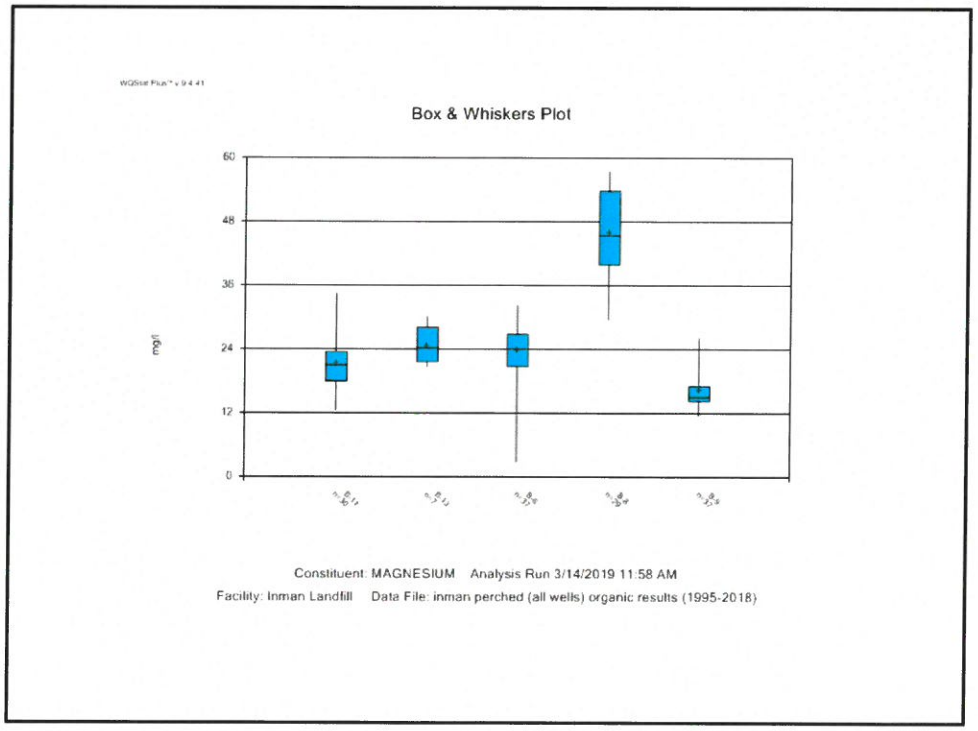

Box & Whiskers Plot
700
560
420
280
140
0
mg/l
Constituent: Bicarbonate Analysis Run 3/14/2019 11:56 AM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

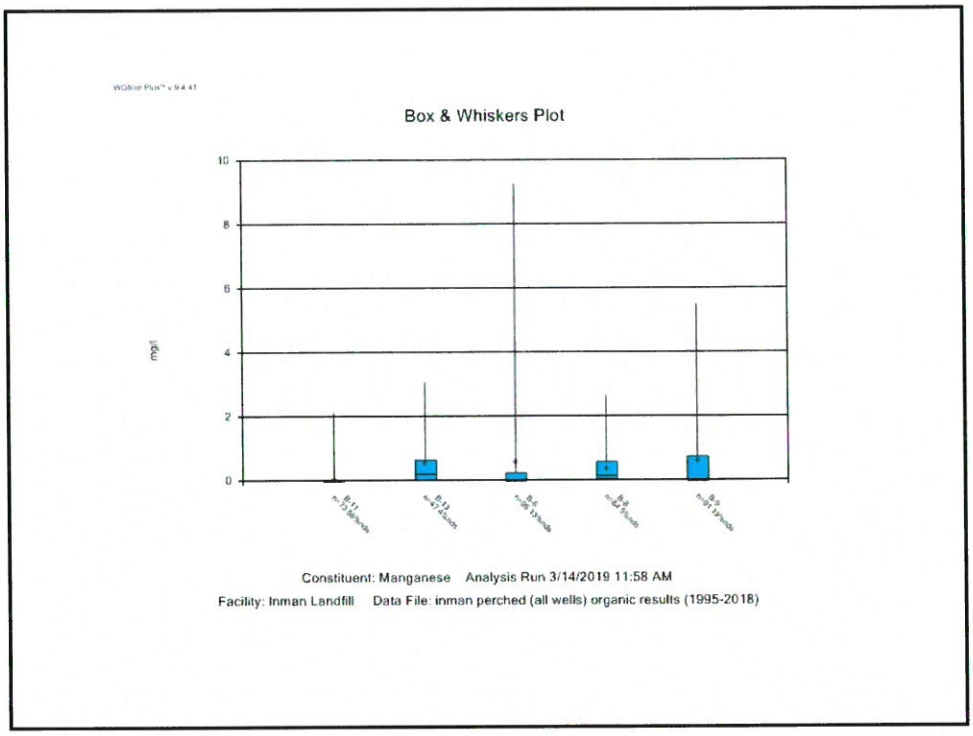

Box & Whiskers Plot
0.006
0.0048
0.0036
0.0024
0.0012
0
mg/l
Constituent: Chromium Analysis Run 3/14/2019 11:57 AM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

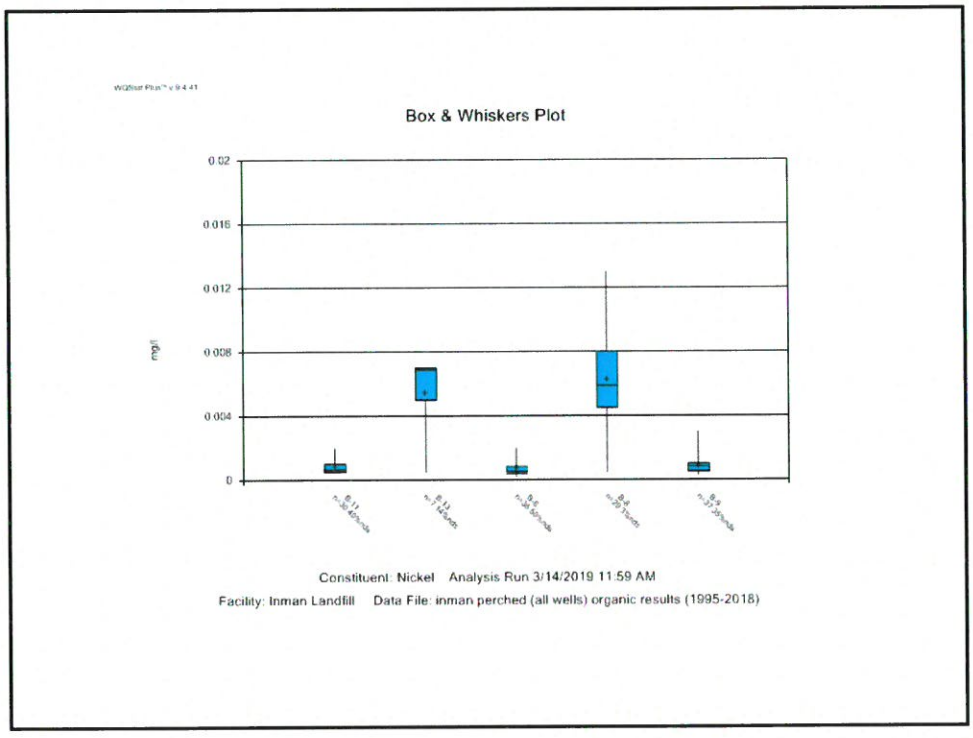

Box & Whiskers Plot
0.02
0.016
0.012
0.008
0.004
0
mg/l
Constituent: COBALT Analysis Run 3/14/2019 11:57 AM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

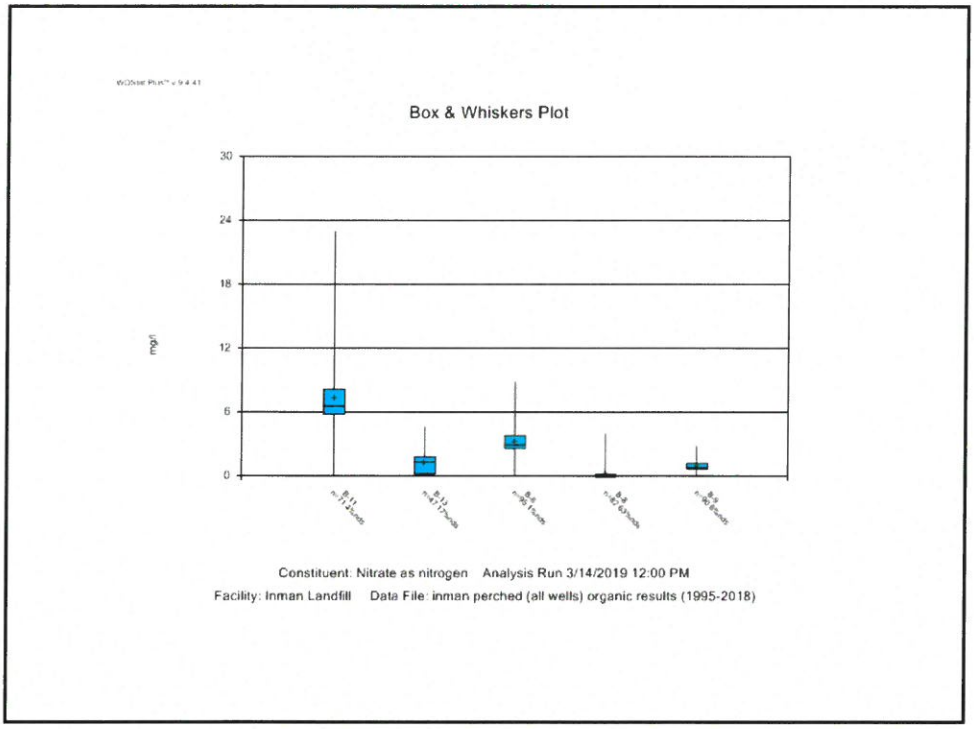

Box & Whiskers Plot
0.01
0.008
0.006
0.004
0.002
0
mg/l
Constituent: Copper Analysis Run 3/14/2019 11:57 AM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

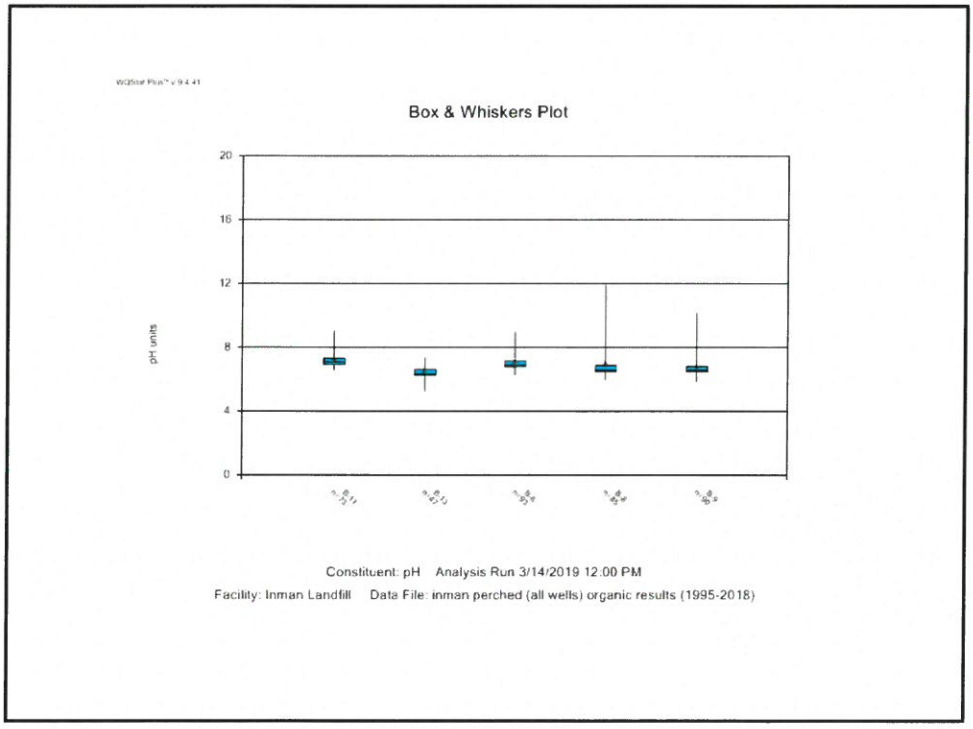

Box & Whiskers Plot
30
24
18
12
6
0
mg/l
Constituent: Iron Analysis Run 3/14/2019 11:58 AM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

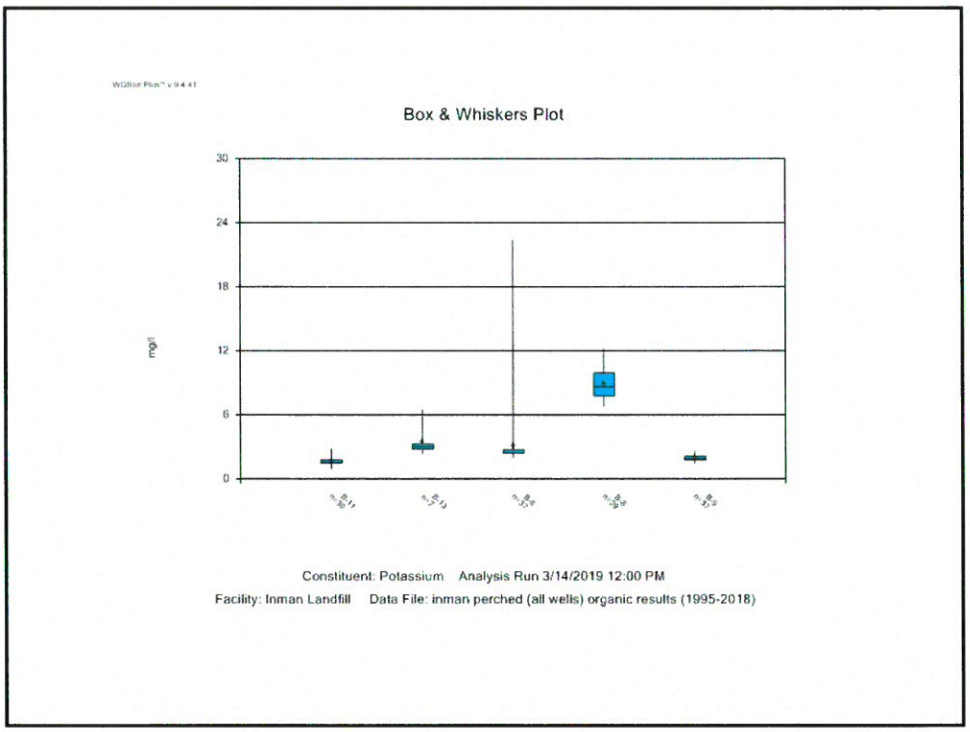

Box & Whiskers Plot
60
48
36
24
12
0
mg/l
Constituent: MAGNESIUM Analysis Run 3/14/2019 11:58 AM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

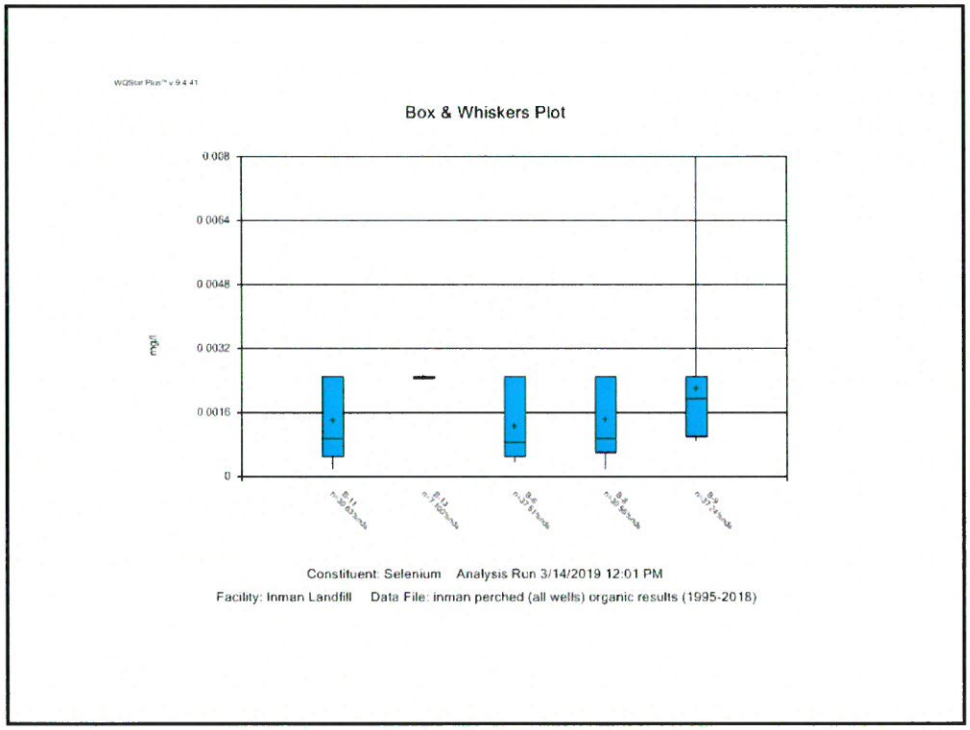

Box & Whiskers Plot
mg/l
10
8
6
4
2
0
Constituent: Manganese Analysis Run 3/14/2019 11:58 AM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

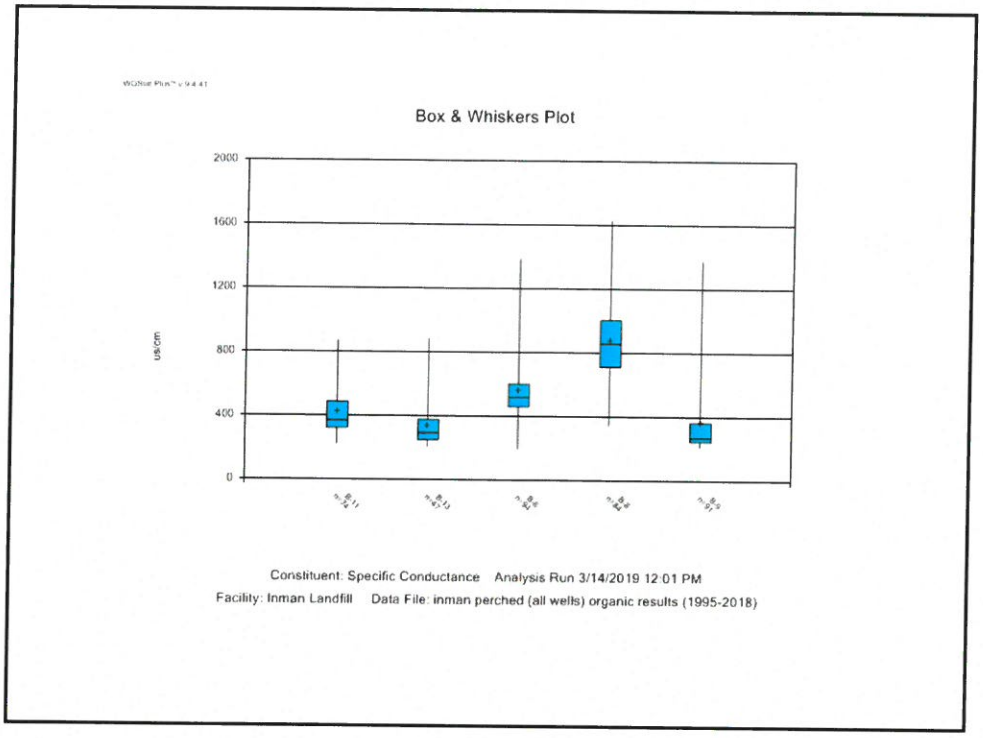

Box & Whiskers Plot
mg/l
0.02
0.016
0.012
0.008
0.004
0
Constituent: Nickel Analysis Run 3/14/2019 11:59 AM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

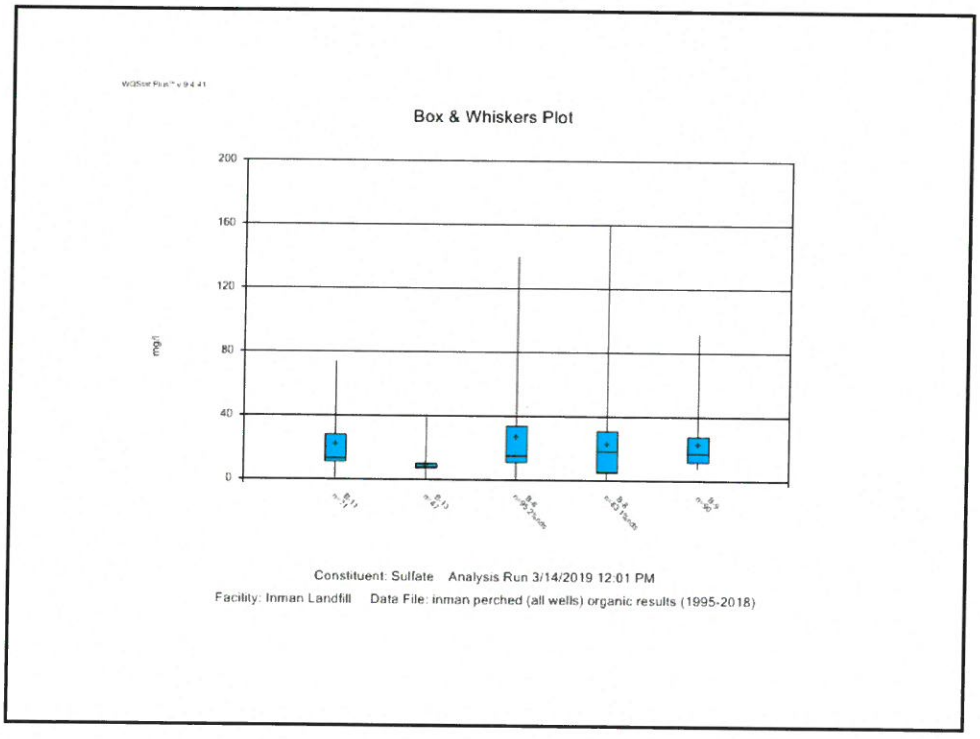

Box & Whiskers Plot
mg/l
30
24
18
12
6
0
Constituent: Nitrate as nitrogen Analysis Run 3/14/2019 12:00 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

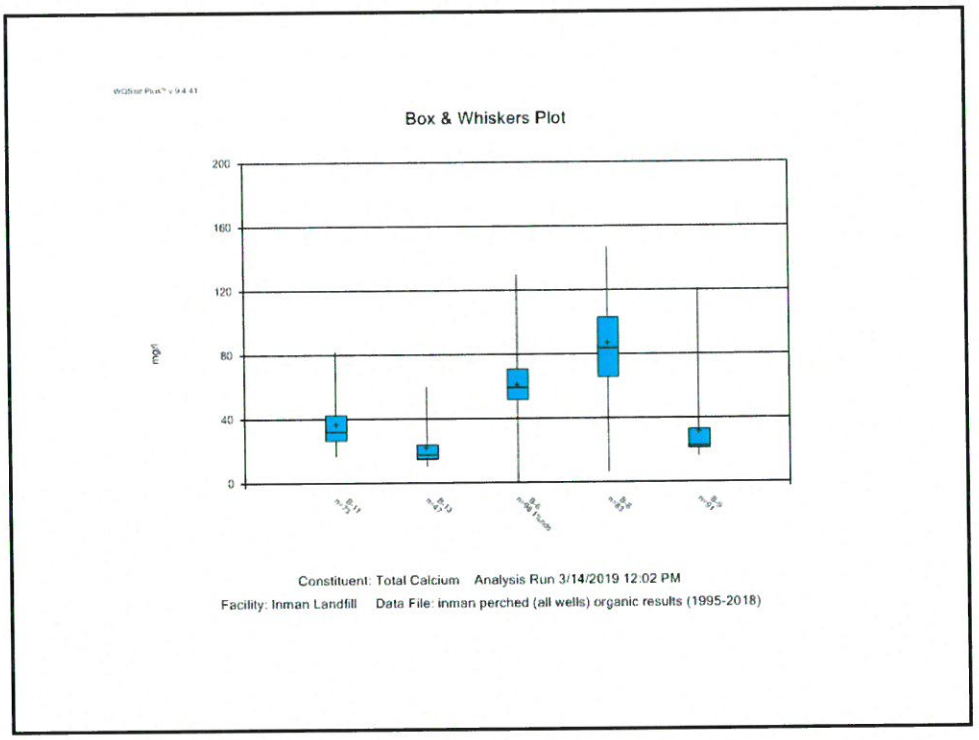

Box & Whiskers Plot
pH units
20
16
12
8
4
0
Constituent: pH Analysis Run 3/14/2019 12:00 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

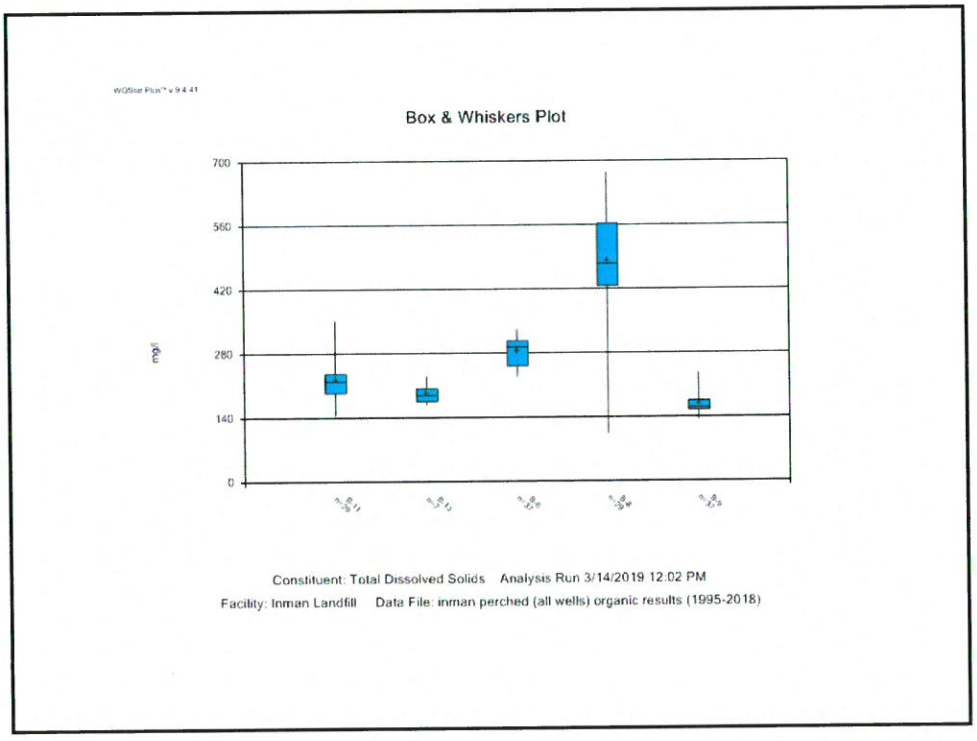

Box & Whiskers Plot
mg/l
30
24
18
12
6
0
Constituent: Potassium Analysis Run 3/14/2019 12:00 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

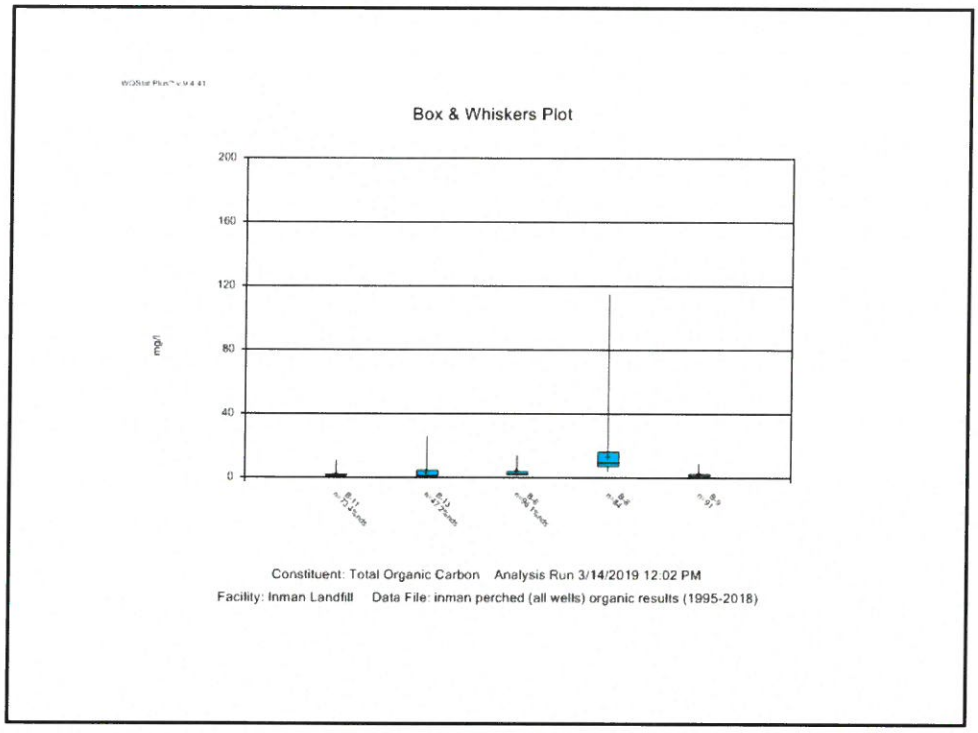

Box & Whiskers Plot
mg/l
0.008
0.0064
0.0048
0.0032
0.0016
0
Constituent: Selenium Analysis Run 3/14/2019 12:01 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

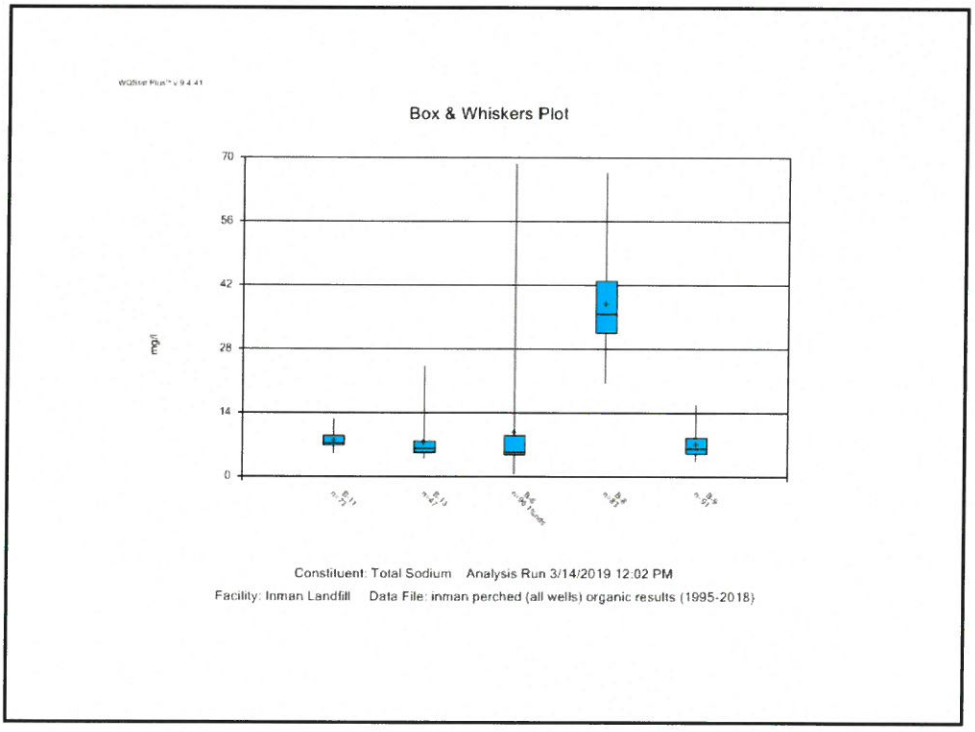

Box & Whiskers Plot
2000
1600
1200
800
400
0
uS/cm
Constituent: Specific Conductance Analysis Run 3/14/2019 12:01 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

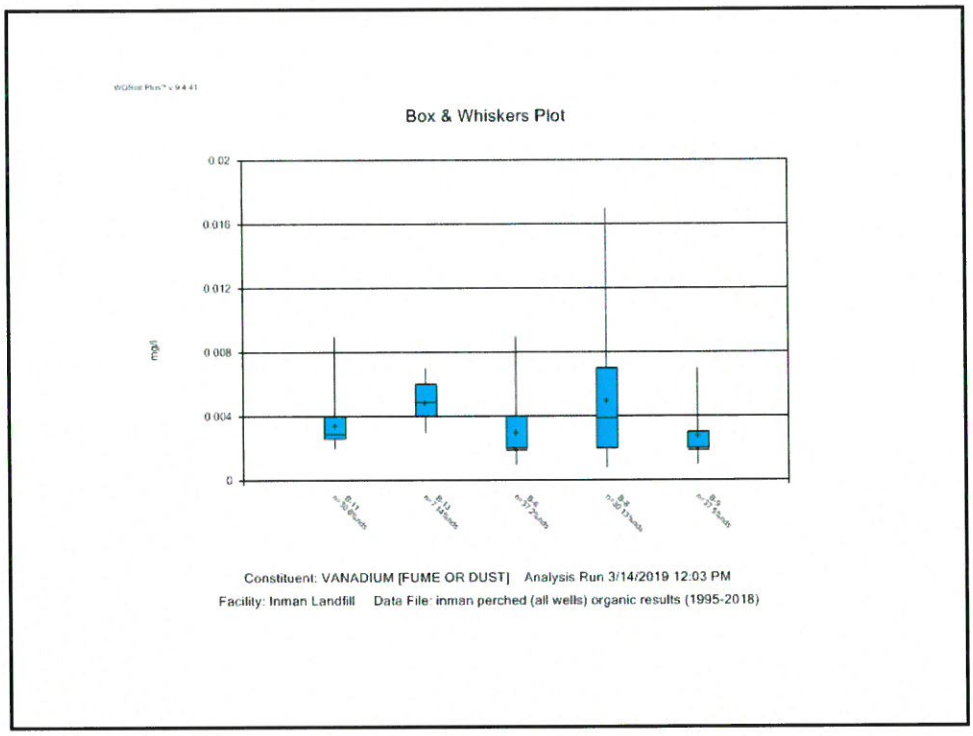

Box & Whiskers Plot
200
160
120
80
40
0
mg/l
Constituent: Sulfate Analysis Run 3/14/2019 12:01 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)

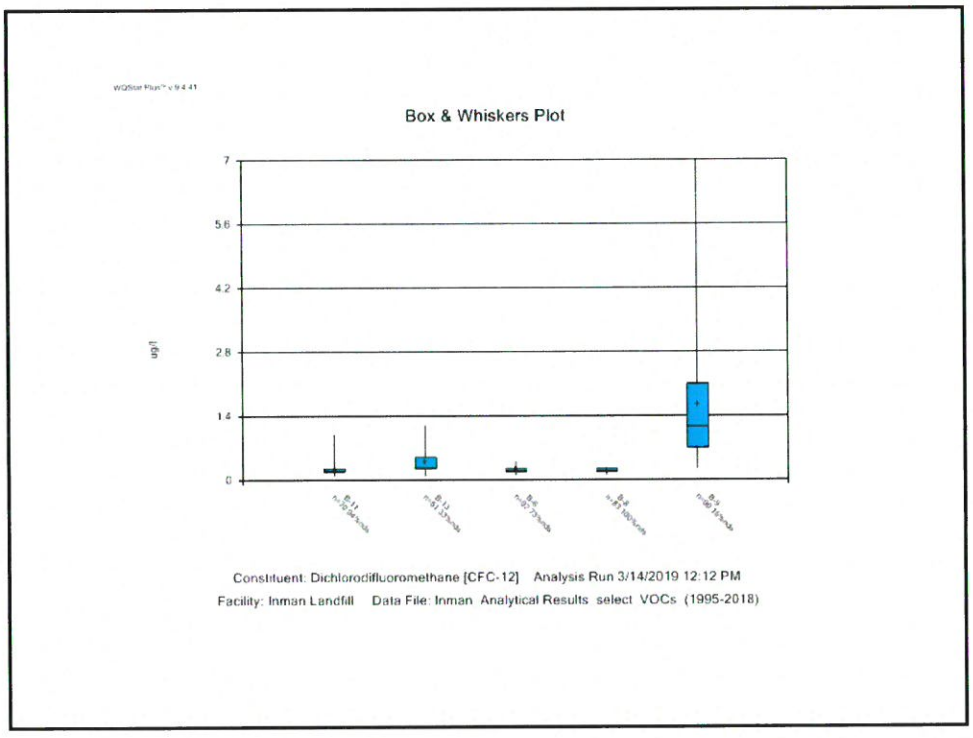

Box & Whiskers Plot
200
160
120
80
40
0
mg/l
Constituent: Total Calcium Analysis Run 3/14/2019 12:02 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)


Box & Whiskers Plot
700
560
420
280
140
0
mg/l
Constituent: Total Dissolved Solids Analysis Run 3/14/2019 12:02 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)


Box & Whiskers Plot
200
160
120
80
40
0
mg/l
Constituent: Total Organic Carbon Analysis Run 3/14/2019 12:02 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)


Box & Whiskers Plot
70
56
42
28
14
0
mg/l
Constituent: Total Sodium Analysis Run 3/14/2019 12:02 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)


Box & Whiskers Plot
0.02
0.016
0.012
0.008
0.004
0
mg/l
Constituent: VANADIUM [FUME OR DUST] Analysis Run 3/14/2019 12:03 PM
Facility: Inman Landfill Data File: inman perched (all wells) organic results (1995-2018)


Box & Whiskers Plot
7
5.6
4.2
2.8
1.4
0
ug/l
Constituent: Dichlorodifluoromethane [CFC-12] Analysis Run 3/14/2019 12:12 PM
Facility: Inman Landfill Data File: Inman Analytical Results select VOCs (1995-2018)

APPENDIX D-4:
Long-Term Mann-Kendall Trend Tests 1994-2018 – Perched Aquifer

Long-Term Mann-Kendall Trend Tests 1995-2018
Perched Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
1,1-dichloroethane	ug/L	**B-6**	**0**	**-5.713**	**-2.33**	**Yes**	**92**	**96.74**	**0.02**
		B-8	**-0.000547**	**-5.445**	**-2.33**	**Yes**	**83**	**72.29**	**0.02**
		B-9	**-0.003576**	**-8.466**	**-2.33**	**Yes**	**90**	**62.22**	**0.02**
		B-11	**0**	**-6.239**	**-2.33**	**Yes**	**70**	**97.14**	**0.02**
		B-13	**-0.1555**	**-5.805**	**-2.33**	**Yes**	**51**	**11.76**	**0.02**
1,2-dichloroethane	ug/L	**B-6**	**0**	**-5.691**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-8	**0**	**-5.586**	**-2.33**	**Yes**	**83**	**100**	**0.02**
		B-9	**0**	**-5.648**	**-2.33**	**Yes**	**90**	**100**	**0.02**
		B-11	**0**	**-6.239**	**-2.33**	**Yes**	**70**	**97.14**	**0.02**
		B-13	**-0.006843**	**-5.044**	**-2.33**	**Yes**	**51**	**74.51**	**0.02**
Acetone	ug/L	**B-6**	**0.06319**	**9.129**	**2.33**	**Yes**	**92**	**96.74**	**0.02**
		B-8	**0.07931**	**9.078**	**2.33**	**Yes**	**83**	**90.36**	**0.02**
		B-9	**0.06224**	**9.514**	**2.33**	**Yes**	**90**	**98.89**	**0.02**
		B-11	**0.06941**	**7.804**	**2.33**	**Yes**	**70**	**97.14**	**0.02**
		B-13	0	0.4298	2.33	No	51	76.47	0.02
Alkalinity	mg/L	**B-6**	**-3.507**	**-185**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-8	-1.745	-14	-119	No	28	0	0.02
		B-9	*-3.712*	*-262*	*-171*	*Yes*	*36*	*0*	*0.02*
		B-11	-5.069	-86	-119	No	28	0	0.02
		B-13	-39.11	-9	-17	No	7	0	0.02
Ammonia as nitrogen	mg/L	**B-6**	**-0.009369**	**-9.713**	**-2.33**	**Yes**	**96**	**26.04**	**0.02**
		B-8	0.005382	2.306	2.33	No	83	13.25	0.02
		B-9	0	-1.743	-2.33	No	91	62.64	0.02
		B-11	**-0.0002879**	**-2.369**	**-2.33**	**Yes**	**72**	**69.44**	**0.02**
		B-13	0	-0.1014	-2.33	No	47	25.53	0.02
Antimony, dissolved	mg/L	**B-6**	**-0.00004416**	**-304**	**-171**	**Yes**	**36**	**50**	**0.02**
		B-8	**-0.00006732**	**-169**	**-125**	**Yes**	**29**	**65.52**	**0.02**
		B-9	**-0.00005122**	**-290**	**-179**	**Yes**	**37**	**64.86**	**0.02**
		B-11	**0**	**-149**	**-132**	**Yes**	**30**	**90**	**0.02**
		B-13	0	-8	-17	No	7	100	0.02
Arsenic, dissolved	mg/L	**B-6**	**-0.0001752**	**-9.879**	**-2.33**	**Yes**	**94**	**19.15**	**0.02**
		B-8	**-0.000315**	**-3.84**	**-2.33**	**Yes**	**83**	**25.3**	**0.02**
		B-9	**-0.00003804**	**-8.887**	**-2.33**	**Yes**	**89**	**19.1**	**0.02**
		B-11	**0**	**-4.501**	**-2.33**	**Yes**	**71**	**35.21**	**0.02**
		B-13	**-0.0003771**	**-6.139**	**-2.33**	**Yes**	**46**	**50**	**0.02**
Barium, dissolved	mg/L	B-6	-0.0003331	-151	-179	No	37	0	0.02
		B-8	-0.0004403	-22	-132	No	30	0	0.02
		B-9	**-0.0002659**	**-194**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-11	-0.0004398	-63	-132	No	30	3.333	0.02
		B-13	-0.001834	-11	-17	No	7	0	0.02
Bicarbonate	mg/L	**B-6**	**-3.501**	**-183**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-8	-1.745	-14	-119	No	28	0	0.02
		B-9	**-3.512**	**-244**	**-171**	**Yes**	**36**	**0**	**0.02**
		B-11	-5.037	-84	-119	No	28	0	0.02
		B-13	-39.11	-9	-17	No	7	0	0.02
Cadmium, dissolved	mg/L	**B-6**	**-0.00003929**	**-6.651**	**-2.33**	**Yes**	**94**	**88.3**	**0.02**
		B-8	**-0.00004165**	**-5.753**	**-2.33**	**Yes**	**82**	**84.15**	**0.02**
		B-9	**-0.00002789**	**-5.658**	**-2.33**	**Yes**	**90**	**87.78**	**0.02**
		B-11	**-0.00004803**	**-6.989**	**-2.33**	**Yes**	**72**	**91.67**	**0.02**
		B-13	0	-1.635	-2.33	No	46	95.65	0.02
Calcium, total	mg/L	**B-6**	**-1.053**	**-5.79**	**-2.33**	**Yes**	**96**	**1.042**	**0.02**
		B-8	**-1.556**	**-3.697**	**-2.33**	**Yes**	**83**	**0**	**0.02**
		B-9	**-0.7472**	**-7.085**	**-2.33**	**Yes**	**91**	**0**	**0.02**
		B-11	**-0.8061**	**-3.915**	**-2.33**	**Yes**	**73**	**0**	**0.02**
		B-13	**-0.6144**	**-2.487**	**-2.33**	**Yes**	**47**	**0**	**0.02**
Chemical Oxygen Demand	mg/L	**B-6**	**-0.08265**	**-2.827**	**-2.33**	**Yes**	**96**	**51.04**	**0.02**
		B-8	-0.3821	-1.251	-2.33	No	83	6.024	0.02
		B-9	0	-0.3687	-2.33	No	91	67.03	0.02
		B-11	**0**	**-2.471**	**-2.33**	**Yes**	**72**	**69.44**	**0.02**
		B-13	-0.09674	-2.018	-2.33	No	47	65.96	0.02

Long-Term Mann-Kendall Trend Tests 1995-2018
Perched Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
Chloride	mg/L	B-6	-0.04454	-1.407	-2.33	No	95	2.105	0.02
		B-8	**-3.431**	**-9.044**	**-2.33**	**Yes**	**83**	**0**	**0.02**
		B-9	**-0.2837**	**-10.09**	**-2.33**	**Yes**	**90**	**0**	**0.02**
		B-11	**-0.1893**	**-7.717**	**-2.33**	**Yes**	**71**	**0**	**0.02**
		B-13	**0.443**	**5.155**	**2.33**	**Yes**	**47**	**0**	**0.02**
Chlorodifluoromethane (Freon 22)	ug/L	B-6	0	1.126	2.33	No	64	98.44	0.02
		B-8	**-0.07293**	**-4.031**	**-2.33**	**Yes**	**58**	**34.48**	**0.02**
		B-9	0	0.8382	2.33	No	64	96.88	0.02
		B-11	0	0	2.33	No	45	97.78	0.02
		B-13	**-0.0183**	**-179**	**-132**	**Yes**	**30**	**43.33**	**0.02**
Chloroethane	ug/L	**B-6**	**0**	**-5.691**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-8	**0**	**-5.459**	**-2.33**	**Yes**	**82**	**100**	**0.02**
		B-9	**0**	**-6.102**	**-2.33**	**Yes**	**90**	**94.44**	**0.02**
		B-11	**0**	**-6.295**	**-2.33**	**Yes**	**70**	**98.57**	**0.02**
		B-13	**-0.004256**	**-4.733**	**-2.33**	**Yes**	**51**	**94.12**	**0.02**
Chromium, dissolved	mg/L	**B-6**	**-0.0001998**	**-271**	**-179**	**Yes**	**37**	**35.14**	**0.02**
		B-8	**-0.0005017**	**-272**	**-132**	**Yes**	**30**	**30**	**0.02**
		B-9	**-0.0002247**	**-416**	**-179**	**Yes**	**37**	**21.62**	**0.02**
		B-11	**-0.0002863**	**-209**	**-132**	**Yes**	**30**	**33.33**	**0.02**
		B-13	0	-10	-17	No	7	100	0.02
cis-1,2-dichloroethene	ug/L	**B-6**	**0**	**-5.691**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-8	**0**	**-5.586**	**-2.33**	**Yes**	**83**	**100**	**0.02**
		B-9	**0**	**-5.648**	**-2.33**	**Yes**	**90**	**100**	**0.02**
		B-11	**0**	**-6.239**	**-2.33**	**Yes**	**70**	**97.14**	**0.02**
		B-13	**-0.6822**	**-6.076**	**-2.33**	**Yes**	**51**	**11.76**	**0.02**
Cobalt, dissolved	mg/L	**B-6**	**0**	**-211**	**-171**	**Yes**	**36**	**69.44**	**0.02**
		B-8	0	-33	-125	No	29	24.14	0.02
		B-9	**0**	**-236**	**-179**	**Yes**	**37**	**67.57**	**0.02**
		B-11	0	-111	-132	No	30	80	0.02
		B-13	0	0	17	No	7	100	0.02
Copper, dissolved	mg/L	**B-6**	**-0.0002187**	**-346**	**-179**	**Yes**	**37**	**48.65**	**0.02**
		B-8	**-0.0004953**	**-185**	**-132**	**Yes**	**30**	**30**	**0.02**
		B-9	**-0.0001802**	**-263**	**-179**	**Yes**	**37**	**48.65**	**0.02**
		B-11	**-0.000166**	**-185**	**-132**	**Yes**	**30**	**53.33**	**0.02**
		B-13	-0.004968	-12	-17	No	7	100	0.02
Dichlorodifluoromethane (CFC-12)	ug/L	**B-6**	**0**	**-4.533**	**-2.33**	**Yes**	**92**	**73.91**	**0.02**
		B-8	**0**	**-5.586**	**-2.33**	**Yes**	**83**	**100**	**0.02**
		B-9	**-0.08013**	**-4.032**	**-2.33**	**Yes**	**90**	**16.67**	**0.02**
		B-11	**0**	**-6.008**	**-2.33**	**Yes**	**70**	**94.29**	**0.02**
		B-13	0	1.469	2.33	No	51	33.33	0.02
Diethyl ether	ug/L	B-6	0	0.8548	2.33	No	64	98.44	0.02
		B-8	**-0.09053**	**-2.749**	**-2.33**	**Yes**	**58**	**24.14**	**0.02**
		B-9	0	0.8724	2.33	No	64	100	0.02
		B-11	0	0	2.33	No	45	97.78	0.02
		B-13	**-0.2631**	**-258**	**-132**	**Yes**	**30**	**40**	**0.02**
Iron, dissolved	mg/L	**B-6**	**0**	**-4.156**	**-2.33**	**Yes**	**96**	**66.67**	**0.02**
		B-8	0.0113	2.067	2.33	No	84	16.67	0.02
		B-9	0	-1.809	-2.33	No	91	71.43	0.02
		B-11	**0**	**-2.9**	**-2.33**	**Yes**	**73**	**61.64**	**0.02**
		B-13	**-0.06808**	**-4.307**	**-2.33**	**Yes**	**47**	**57.45**	**0.02**
Lead, dissolved	mg/L	**B-6**	**-0.00002728**	**-5.157**	**-2.33**	**Yes**	**95**	**94.74**	**0.02**
		B-8	**-0.00003172**	**-4.753**	**-2.33**	**Yes**	**83**	**92.77**	**0.02**
		B-9	**-0.00002564**	**-4.755**	**-2.33**	**Yes**	**91**	**90.11**	**0.02**
		B-11	**-0.00003616**	**-6.515**	**-2.33**	**Yes**	**73**	**95.89**	**0.02**
		B-13	0	-1.736	-2.33	No	47	97.87	0.02

Long-Term Mann-Kendall Trend Tests 1995-2018
Perched Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
Magnesium, total	mg/L	**B-6**	**-0.5909**	**-201**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-8	-0.06567	-4	-125	No	29	0	0.02
		B-9	**-0.4586**	**-339**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-11	-0.3036	-40	-132	No	30	0	0.02
		B-13	-3.542	-5	-17	No	7	0	0.02
Manganese, dissolved	mg/L	**B-6**	**-0.0126**	**-11.03**	**-2.33**	**Yes**	**96**	**13.54**	**0.02**
		B-8	-0.005571	-1.669	-2.33	No	84	5.952	0.02
		B-9	**-0.0499**	**-10.42**	**-2.33**	**Yes**	**91**	**19.78**	**0.02**
		B-11	**-0.0002883**	**-6.807**	**-2.33**	**Yes**	**73**	**56.16**	**0.02**
		B-13	**-0.07596**	**-8.101**	**-2.33**	**Yes**	**47**	**4.255**	**0.02**
Mercury, dissolved	mg/L	B-6	0	-1.697	-2.33	No	95	98.95	0.02
		B-8	0	-1.133	-2.33	No	83	98.8	0.02
		B-9	**0**	**-2.858**	**-2.33**	**Yes**	**90**	**98.89**	**0.02**
		B-11	0	-2.083	-2.33	No	72	97.22	0.02
		B-13	0	0.1324	2.33	No	47	100	0.02
Nickel, dissolved	mg/L	B-6	0	119	171	No	36	50	0.02
		B-8	-0.0002463	-83	-125	No	29	3.448	0.02
		B-9	0	60	179	No	37	35.14	0.02
		B-11	**0.00003788**	**146**	**132**	**Yes**	**30**	**40**	**0.02**
		B-13	0	-6	-17	No	7	14.29	0.02
Nitrate as nitrogen	mg/L	**B-6**	**0.05874**	**4.631**	**2.33**	**Yes**	**95**	**1.053**	**0.02**
		B-8	0	-0.9772	-2.33	No	82	63.41	0.02
		B-9	0.007293	1.081	2.33	No	90	6.667	0.02
		B-11	-0.04655	-1.097	-2.33	No	71	4.225	0.02
		B-13	**0.1155**	**4.112**	**2.33**	**Yes**	**47**	**17.02**	**0.02**
Nitrite as nitrogen	mg/L	B-6	0	-0.1329	-2.33	No	95	89.47	0.02
		B-8	**0**	**3.268**	**2.33**	**Yes**	**82**	**95.12**	**0.02**
		B-9	0	0.3628	2.33	No	90	96.67	0.02
		B-11	0	0.5863	2.33	No	71	92.96	0.02
		B-13	0	1.767	2.33	No	47	87.23	0.02
pH	mg/L	**B-6**	**0.02325**	**5.308**	**2.33**	**Yes**	**93**	**0**	**0.02**
		B-8	0.009998	1.671	2.33	No	85	0	0.02
		B-9	**0.01451**	**3.636**	**2.33**	**Yes**	**90**	**0**	**0.02**
		B-11	**0.01451**	**2.567**	**2.33**	**Yes**	**73**	**0**	**0.02**
		B-13	-0.01595	-1.991	-2.33	No	47	0	0.02
Potassium, total	mg/L	B-6	0.01838	87	179	No	37	0	0.02
		B-8	-0.1734	-76	-125	No	29	0	0.02
		B-9	-0.01184	-99	-179	No	37	0	0.02
		B-11	-0.03544	-101	-132	No	30	0	0.02
		B-13	-0.3668	-9	-17	No	7	0	0.02
Selenium, dissolved	mg/L	**B-6**	**-0.0002001**	**-389**	**-179**	**Yes**	**37**	**51.35**	**0.02**
		B-8	**-0.000254**	**-287**	**-132**	**Yes**	**30**	**56.67**	**0.02**
		B-9	**-0.0001837**	**-368**	**-179**	**Yes**	**37**	**24.32**	**0.02**
		B-11	**-0.0002743**	**-225**	**-132**	**Yes**	**30**	**63.33**	**0.02**
		B-13	0	0	17	No	7	100	0.02
Sodium, total	mg/L	**B-6**	**-0.3675**	**-10.63**	**-2.33**	**Yes**	**96**	**1.042**	**0.02**
		B-8	**-0.9913**	**-7.076**	**-2.33**	**Yes**	**83**	**0**	**0.02**
		B-9	**-0.313**	**-10.7**	**-2.33**	**Yes**	**91**	**0**	**0.02**
		B-11	**-0.1399**	**-5.864**	**-2.33**	**Yes**	**73**	**0**	**0.02**
		B-13	**-0.2233**	**-3.054**	**-2.33**	**Yes**	**47**	**0**	**0.02**
Specific Conductance	us/cm	**B-6**	**-10.48**	**-7.108**	**-2.33**	**Yes**	**94**	**0**	**0.02**
		B-8	**-13.11**	**-3.639**	**-2.33**	**Yes**	**84**	**0**	**0.02**
		B-9	**-8.692**	**-9.343**	**-2.33**	**Yes**	**91**	**0**	**0.02**
		B-11	**-8.513**	**-3.799**	**-2.33**	**Yes**	**74**	**0**	**0.02**
		B-13	-7.337	-2.201	-2.33	No	47	0	0.02
Sulfate	mg/L	**B-6**	**-1.6**	**-9.858**	**-2.33**	**Yes**	**95**	**2.105**	**0.02**
		B-8	**-1.242**	**-3.953**	**-2.33**	**Yes**	**83**	**1.205**	**0.02**
		B-9	**-1.307**	**-9.664**	**-2.33**	**Yes**	**90**	**0**	**0.02**
		B-11	**-0.9865**	**-4.068**	**-2.33**	**Yes**	**71**	**0**	**0.02**
		B-13	0.1022	1.342	2.33	No	47	0	0.02

Long-Term Mann-Kendall Trend Tests 1995-2018
Perched Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
Tetrachloroethene	ug/L	**B-6**	**0**	**-5.691**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-8	**0**	**-5.586**	**-2.33**	**Yes**	**83**	**100**	**0.02**
		B-9	**0**	**-5.648**	**-2.33**	**Yes**	**90**	**100**	**0.02**
		B-11	**0**	**-6.239**	**-2.33**	**Yes**	**70**	**97.14**	**0.02**
		B-13	-0.006435	-0.7336	-2.33	No	51	19.61	0.02
Tetrahydrofuran	ug/L	**B-6**	**0**	**6.547**	**2.33**	**Yes**	**64**	**98.44**	**0.02**
		B-8	**0**	**5.692**	**2.33**	**Yes**	**58**	**98.28**	**0.02**
		B-9	**0**	**5.944**	**2.33**	**Yes**	**64**	**100**	**0.02**
		B-11	**0**	**4.872**	**2.33**	**Yes**	**45**	**97.78**	**0.02**
		B-13	**0**	**209**	**132**	**Yes**	**30**	**100**	**0.02**
Toluene	ug/L	**B-6**	**0**	**-5.568**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-8	**0**	**-3.556**	**-2.33**	**Yes**	**83**	**91.57**	**0.02**
		B-9	**0**	**-5.526**	**-2.33**	**Yes**	**89**	**100**	**0.02**
		B-11	**0**	**-6.143**	**-2.33**	**Yes**	**70**	**98.57**	**0.02**
		B-13	**0**	**-4.015**	**-2.33**	**Yes**	**51**	**100**	**0.02**
Total Dissolved Solids	mg/L	B-6	-3.102	-146	-179	No	37	0	0.02
		B-8	-7.339	-58	-125	No	29	0	0.02
		B-9	**-3.527**	**-293**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-11	-1.481	-29	-125	No	29	0	0.02
		B-13	-26.42	-14	-17	No	7	0	0.02
Total Organic Carbon	mg/L	**B-6**	**-0.1302**	**-8.988**	**-2.33**	**Yes**	**96**	**1.042**	**0.02**
		B-8	-0.0707	-0.8113	-2.33	No	84	0	0.02
		B-9	**-0.05951**	**-6.493**	**-2.33**	**Yes**	**91**	**0**	**0.02**
		B-11	**-0.028**	**-4.388**	**-2.33**	**Yes**	**73**	**4.11**	**0.02**
		B-13	**-0.2874**	**-5.327**	**-2.33**	**Yes**	**47**	**2.128**	**0.02**
Trichloroethene	ug/L	**B-6**	**0**	**-5.691**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-8	**0**	**-5.586**	**-2.33**	**Yes**	**83**	**100**	**0.02**
		B-9	**0**	**-5.648**	**-2.33**	**Yes**	**90**	**100**	**0.02**
		B-11	**0**	**-6.239**	**-2.33**	**Yes**	**70**	**97.14**	**0.02**
		B-13	**-0.05958**	**-3.017**	**-2.33**	**Yes**	**51**	**13.73**	**0.02**
Trichlorofluoromethane (CFC-11)	ug/L	**B-6**	**0**	**-5.691**	**-2.33**	**Yes**	**92**	**97.83**	**0.02**
		B-8	**0**	**-5.586**	**-2.33**	**Yes**	**83**	**100**	**0.02**
		B-9	0	-0.7333	-2.33	No	90	33.33	0.02
		B-11	**0**	**-6.295**	**-2.33**	**Yes**	**70**	**98.57**	**0.02**
		B-13	**0**	**-3.138**	**-2.33**	**Yes**	**51**	**80.39**	**0.02**
Vanadium, dissolved	mg/L	**B-6**	**-0.0003202**	**-364**	**-179**	**Yes**	**37**	**2.703**	**0.02**
		B-8	**-0.0007505**	**-187**	**-132**	**Yes**	**30**	**13.33**	**0.02**
		B-9	**-0.0001967**	**-298**	**-179**	**Yes**	**37**	**5.405**	**0.02**
		B-11	**-0.0002743**	**-222**	**-132**	**Yes**	**30**	**6.667**	**0.02**
		B-13	-0.0008239	-7	-17	No	7	14.29	0.02
Vinyl chloride	ug/L	**B-6**	**0**	**-3.803**	**-2.33**	**Yes**	**92**	**97.83**	**0.02**
		B-8	0	-0.2682	-2.33	No	82	47.56	0.02
		B-9	**0**	**-5.79**	**-2.33**	**Yes**	**90**	**83.33**	**0.02**
		B-11	**0**	**-6.142**	**-2.33**	**Yes**	**70**	**95.71**	**0.02**
		B-13	**-0.02228**	**-6.265**	**-2.33**	**Yes**	**51**	**62.75**	**0.02**
Zinc, dissolved	mg/L	**B-6**	**-0.0002106**	**-6.603**	**-2.33**	**Yes**	**96**	**51.04**	**0.02**
		B-8	**-0.0002294**	**-5.818**	**-2.33**	**Yes**	**84**	**50**	**0.02**
		B-9	**-0.0001611**	**-3.782**	**-2.33**	**Yes**	**91**	**46.15**	**0.02**
		B-11	**-0.0002143**	**-5.775**	**-2.33**	**Yes**	**73**	**50.68**	**0.02**
		B-13	**-0.0004265**	**-2.955**	**-2.33**	**Yes**	**47**	**46.81**	**0.02**

APPENDIX D-5:
Short-Term Mann-Kendall Trend Tests 2014-2018 – Perched Aquifer

Short-Term Mann-Kendall Trend Tests 2014-2018
Perched Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
1,1-dichloroethane	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
1,2-dichloroethane	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Acetone	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	7	35	No	12	83.33	0.02
		B-9	0	-16	-68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Alkalinity	mg/L	**B-6**	**-3.507**	**-185**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-8	-1.745	-14	-119	No	28	0	0.02
		B-9	**-3.712**	**-262**	**-171**	**Yes**	**36**	**0**	**0.02**
		B-11	-5.069	-86	-119	No	28	0	0.02
Ammonia as nitrogen	mg/L	**B-6**	**-0.009369**	**-9.713**	**-2.33**	**Yes**	**96**	**26.04**	**0.02**
		B-8	0.005382	2.306	2.33	No	83	13.25	0.02
		B-9	0	-1.743	-2.33	No	91	62.64	0.02
		B-11	**-0.0002879**	**-2.369**	**-2.33**	**Yes**	**72**	**69.44**	**0.02**
Antimony, dissolved	mg/L	**B-6**	**-0.00004416**	**-304**	**-171**	**Yes**	**36**	**50**	**0.02**
		B-8	**-0.00006732**	**-169**	**-125**	**Yes**	**29**	**65.52**	**0.02**
		B-9	**-0.00005122**	**-290**	**-179**	**Yes**	**37**	**64.86**	**0.02**
		B-11	**0**	**-149**	**-132**	**Yes**	**30**	**90**	**0.02**
Arsenic, dissolved	mg/L	**B-6**	**-0.0001752**	**-9.879**	**-2.33**	**Yes**	**94**	**19.15**	**0.02**
		B-8	**-0.000315**	**-3.84**	**-2.33**	**Yes**	**83**	**25.3**	**0.02**
		B-9	**-0.00003804**	**-8.887**	**-2.33**	**Yes**	**89**	**19.1**	**0.02**
		B-11	**0**	**-4.501**	**-2.33**	**Yes**	**71**	**35.21**	**0.02**
Barium, dissolved	mg/L	B-6	-0.0003331	-151	-179	No	37	0	0.02
		B-8	-0.0004403	-22	-132	No	30	0	0.02
		B-9	**-0.0002659**	**-194**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-11	-0.0004398	-63	-132	No	30	3.333	0.02
Bicarbonate	mg/L	**B-6**	**-3.501**	**-183**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-8	-1.745	-14	-119	No	28	0	0.02
		B-9	**-3.512**	**-244**	**-171**	**Yes**	**36**	**0**	**0.02**
		B-11	-5.037	-84	-119	No	28	0	0.02
Cadmium, dissolved	mg/L	B-6	0	-9	-68	No	19	52.63	0.02
		B-8	0	-14	-31	No	11	63.64	0.02
		B-9	0	1	68	No	19	52.63	0.02
		B-11	0	2	35	No	12	83.33	0.02
Chemical Oxygen Demand	mg/L	B-6	0	29	68	No	19	52.63	0.02
		B-8	-9.821	-24	-35	No	12	8.333	0.02
		B-9	0	12	68	No	19	73.68	0.02
		B-11	0	0	35	No	12	50	0.02
Chloride	mg/L	B-6	-0.05028	-3	-68	No	19	0	0.02
		B-8	-0.9806	-32	-35	No	12	0	0.02
		B-9	0	-1	-68	No	19	0	0.02
		B-11	-0.1177	-25	-35	No	12	0	0.02
Chlorodifluoromethane (Freon 22)	ug/L	B-6	0	1	68	No	19	94.74	0.02
		B-8	0	-7	-35	No	12	75	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Chloroethane	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Chromium, dissolved	mg/L	B-6	0	-2	-68	No	19	5.263	0.02
		B-8	-0.00009061	-18	-35	No	12	0	0.02
		B-9	0	-44	-68	No	19	0	0.02
		B-11	0	5	35	No	12	0	0.02

Short-Term Mann-Kendall Trend Tests 2014-2018
Perched Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
cis-1,2-dichloroethene	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Cobalt, dissolved	mg/L	B-6	0	-32	-68	No	19	47.37	0.02
		B-8	0	-4	-31	No	11	0	0.02
		B-9	0	-23	-68	No	19	42.11	0.02
		B-11	0	0	35	No	12	58.33	0.02
Copper, dissolved	mg/L	B-6	-0.00006726	-48	-68	No	19	5.263	0.02
		B-8	-0.000594	-21	-35	No	12	0	0.02
		B-9	0	4	68	No	19	5.263	0.02
		B-11	0.00002879	13	35	No	12	8.333	0.02
Dichlorodifluoromethane (CFC-12)	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	**-0.1723**	**-101**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-11	0	11	35	No	12	91.67	0.02
Dichloromonofluoromethane (Freon 21)	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	-4	-35	No	12	83.33	0.02
		B-9	0	0	63	No	18	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Diethyl ether	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	-6	-35	No	12	41.67	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Iron, dissolved	mg/L	B-6	0	-3	-68	No	19	89.47	0.02
		B-8	0.2151	7	35	No	12	16.67	0.02
		B-9	0	21	68	No	19	89.47	0.02
		B-11	0	11	35	No	12	91.67	0.02
Lead, dissolved	mg/L	B-6	0	11	68	No	19	84.21	0.02
		B-8	0	5	31	No	11	90.91	0.02
		B-9	0	-8	-68	No	19	73.68	0.02
		B-11	0	-13	-35	No	12	91.67	0.02
Magnesium, dissolved	mg/L	B-6	-1.13	-48	-68	No	19	0	0.02
		B-8	-1.535	-10	-35	No	12	0	0.02
		B-9	-0.4345	-54	-68	No	19	0	0.02
		B-11	0	0	35	No	12	0	0.02
Manganese	mg/L	B-6	-0.00009045	-54	-68	No	19	10.53	0.02
		B-8	-0.006412	-4	-35	No	12	0	0.02
		B-9	-0.0001205	-45	-68	No	19	21.05	0.02
		B-11	0	26	35	No	12	66.67	0.02
Mercury, dissolved	mg/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	31	No	11	100	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Nickel, dissolved	mg/L	B-6	-0.0000365	-23	-68	No	19	15.79	0.02
		B-8	-0.0005048	-12	-31	No	11	0	0.02
		B-9	-0.00007952	-63	-68	No	19	5.263	0.02
		B-11	0.0002136	34	35	No	12	8.333	0.02
Nitrate as nitrogen	mg/L	B-6	0.1319	40	68	No	19	0	0.02
		B-8	-0.05786	-19	-35	No	12	50	0.02
		B-9	0.1608	61	68	No	19	0	0.02
		B-11	0.6733	21	35	No	12	0	0.02
Nitrite as nitrogen	mg/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
pH	pH units	B-6	-0.05518	-34	-68	No	19	0	0.02
		B-8	-0.5653	-26	-35	No	12	0	0.02
		B-9	-0.1318	-47	-68	No	19	0	0.02
		B-11	-0.1419	-20	-35	No	12	0	0.02
Potassium	mg/L	B-6	0	12	68	No	19	0	0.02
		B-8	-0.3484	-8	-35	No	12	0	0.02
		B-9	0.02914	21	68	No	19	0	0.02
		B-11	0.01075	15	35	No	12	0	0.02

Short-Term Mann-Kendall Trend Tests 2014-2018
Perched Aquifer

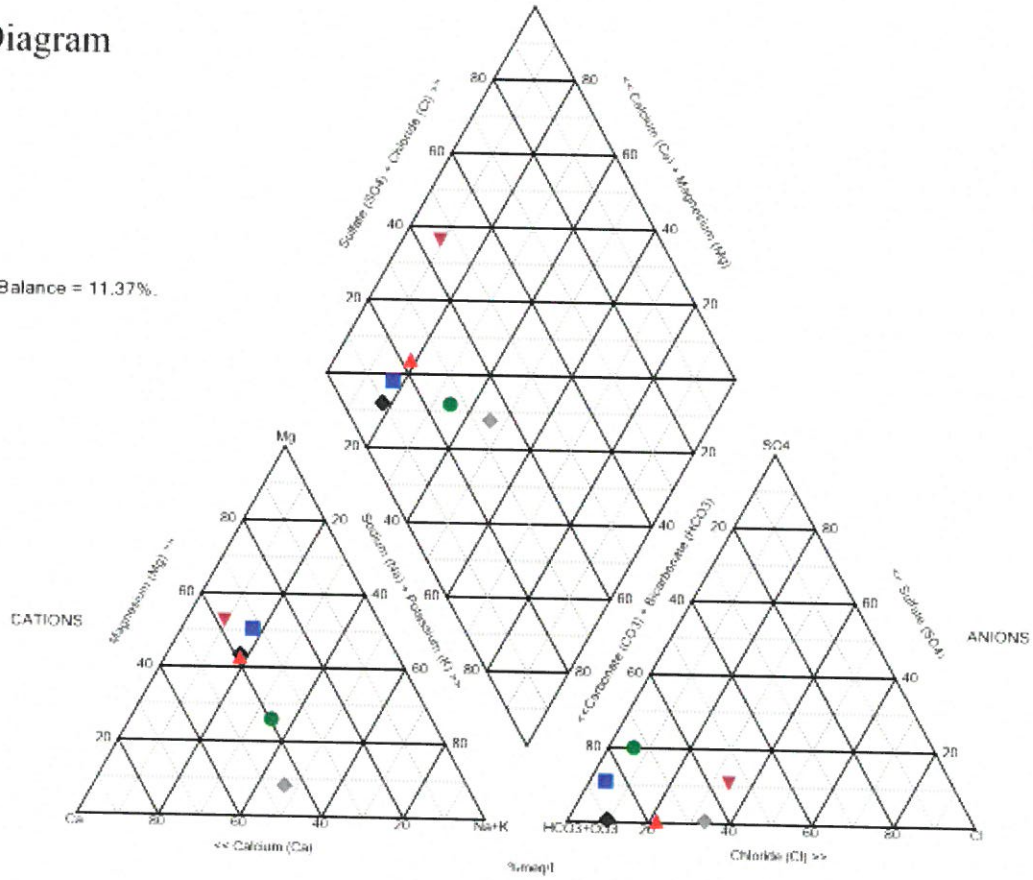
Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
Selenium, dissolved	mg/L	B-6	0	8	68	No	19	10.53	0.02
		B-8	-0.0001133	-21	-35	No	12	0	0.02
		B-9	0	-42	-68	No	19	0	0.02
		B-11	0.00004976	14	35	No	12	16.67	0.02
Specific Conductance	us/cm	B-6	-11.41	-46	-68	No	19	0	0.02
		B-8	2.849	0	35	No	12	0	0.02
		B-9	**-8.323**	**-92**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-11	9.393	10	35	No	12	0	0.02
Sulfate	mg/L	B-6	-0.1003	-10	-68	No	19	0	0.02
		B-8	0.1009	0	35	No	12	8.333	0.02
		B-9	-0.3085	-28	-68	No	19	0	0.02
		B-11	-0.1851	-3	-35	No	12	0	0.02
Tetrachloroethene	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Tetrahydrofuran	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	0	-16	-68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Calcium, total	mg/L	B-6	-1.556	-42	-68	No	19	0	0.02
		B-8	-5.91	-26	-35	No	12	0	0.02
		B-9	-0.7787	-60	-68	No	19	0	0.02
		B-11	-0.8806	-12	-35	No	12	0	0.02
Toluene	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	-3	-35	No	12	91.67	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Total Dissolved Solids	mg/L	B-6	-7.755	-39	-68	No	19	0	0.02
		B-8	-23.44	-12	-35	No	12	0	0.02
		B-9	**-3.519**	**-69**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-11	-1.244	-9	-35	No	12	0	0.02
Total Organic Carbon	mg/L	B-6	-0.07526	-45	-68	No	19	0	0.02
		B-8	-1.378	-16	-35	No	12	0	0.02
		B-9	0.02466	28	68	No	19	0	0.02
		B-11	0.03005	16	35	No	12	0	0.02
Sodium, total	mg/L	B-6	0	-5	-68	No	19	0	0.02
		B-8	-1.256	-18	-35	No	12	0	0.02
		B-9	**-0.2407**	**-76**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-11	-0.02874	-3	-35	No	12	0	0.02
Trichloroethene	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	0	0	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Trichlorofluoromethane (CFC-11)	ug/L	B-6	0	4	68	No	19	94.74	0.02
		B-8	0	0	35	No	12	100	0.02
		B-9	0	-59	-68	No	19	57.89	0.02
		B-11	0	11	35	No	12	91.67	0.02
Vanadium, dissolved	mg/L	B-6	0	-56	-68	No	19	0	0.02
		B-8	0.0001263	14	35	No	12	16.67	0.02
		B-9	0	-20	-68	No	19	5.263	0.02
		B-11	-0.0002307	-32	-35	No	12	0	0.02
Vinyl chloride	ug/L	B-6	0	66	68	No	19	94.74	0.02
		B-8	-0.00332	-14	-35	No	12	41.67	0.02
		B-9	0	60	68	No	19	100	0.02
		B-11	0	11	35	No	12	91.67	0.02
Zinc, dissolved	mg/L	B-6	-0.00008892	-38	-68	No	19	10.53	0.02
		B-8	-0.0003572	-22	-35	No	12	0	0.02
		B-9	0	3	68	No	19	10.53	0.02
		B-11	-0.00006506	-4	-35	No	12	16.67	0.02

APPENDIX E-1:
Piper Diagrams 2018 – Upper Regional Aquifer

WQStat Plus™ v.9.4.41

Piper Diagram

Cation-Anion Balance = 11.37%.



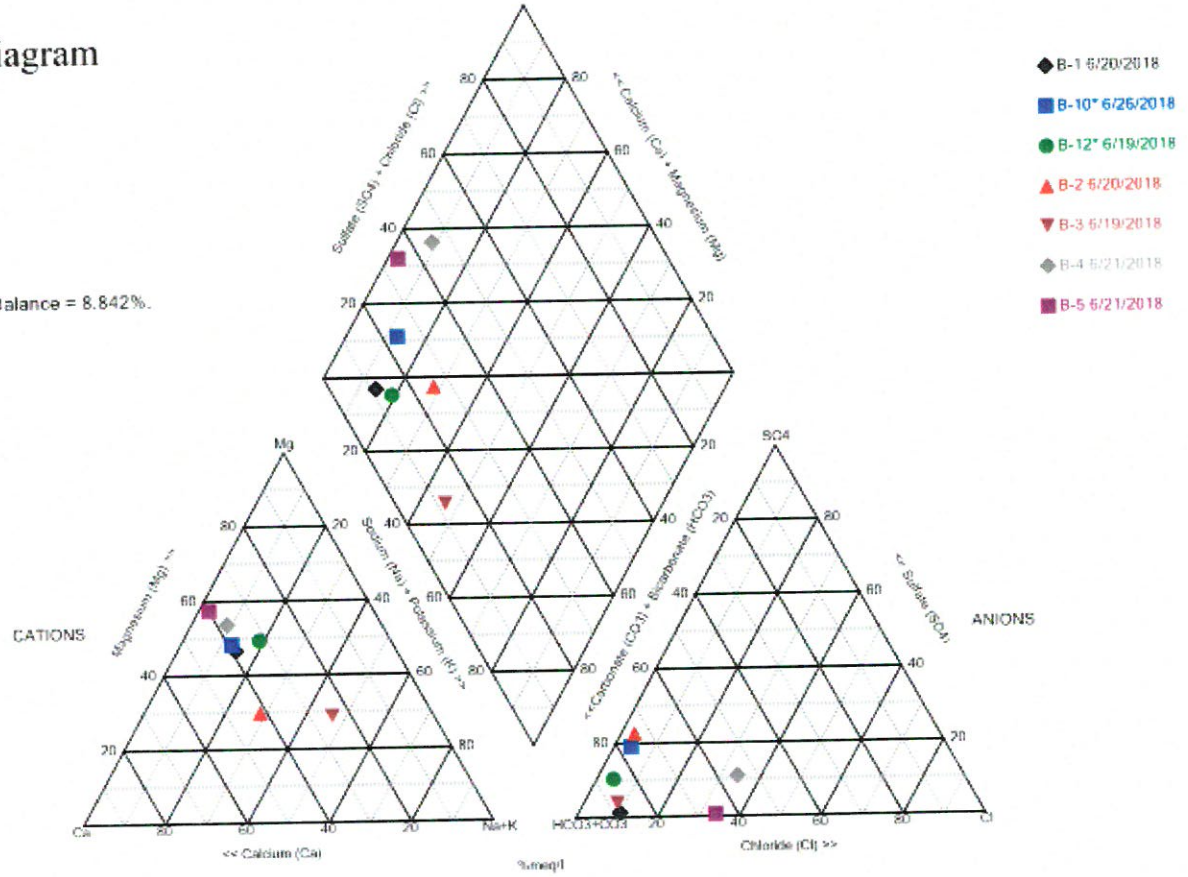
Analysis Run 3/4/2019 1:17 PM

Facility: inman Data File: inman regional organic results (1995-2018)

WQStat Plus™ v.9.4.41

Piper Diagram

Cation-Anion Balance = 8.842%.



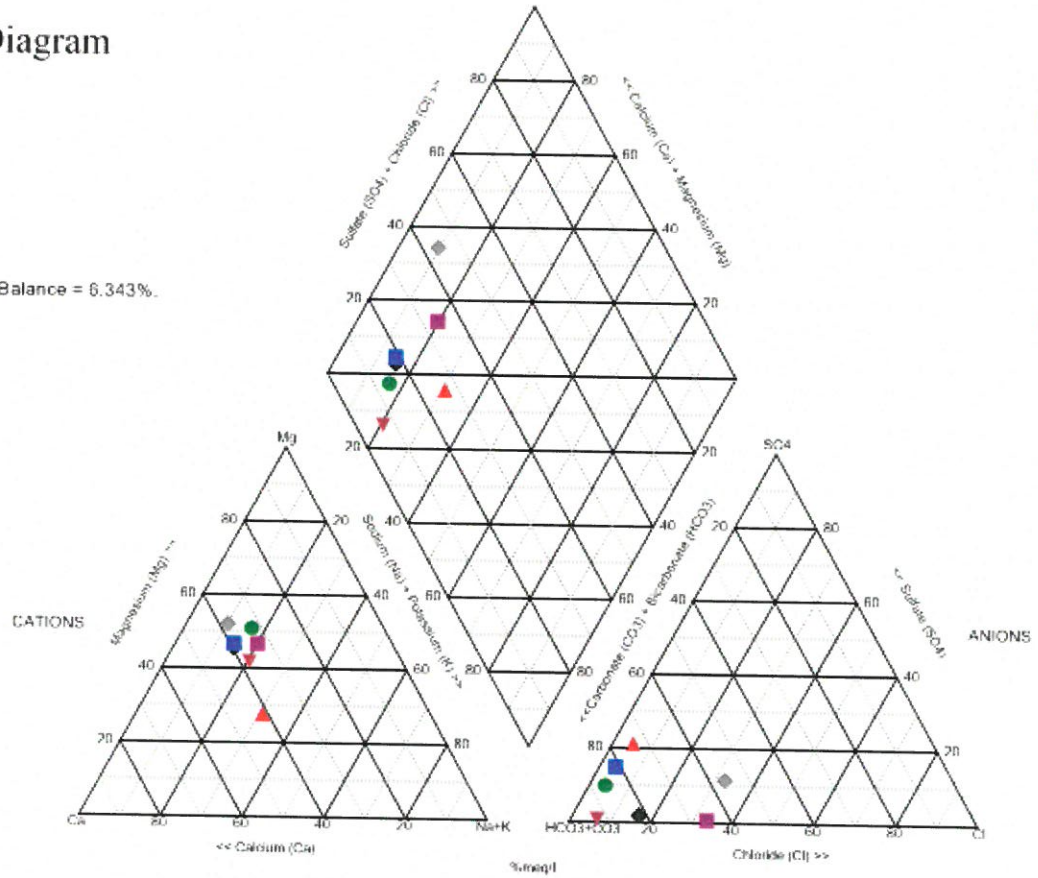
Analysis Run 3/4/2019 1:55 PM

Facility: inman Data File: inman regional organic results (1995-2018)

WQStat Plus™ v.9.4.41

Piper Diagram

Cation-Anion Balance = 6.343%.



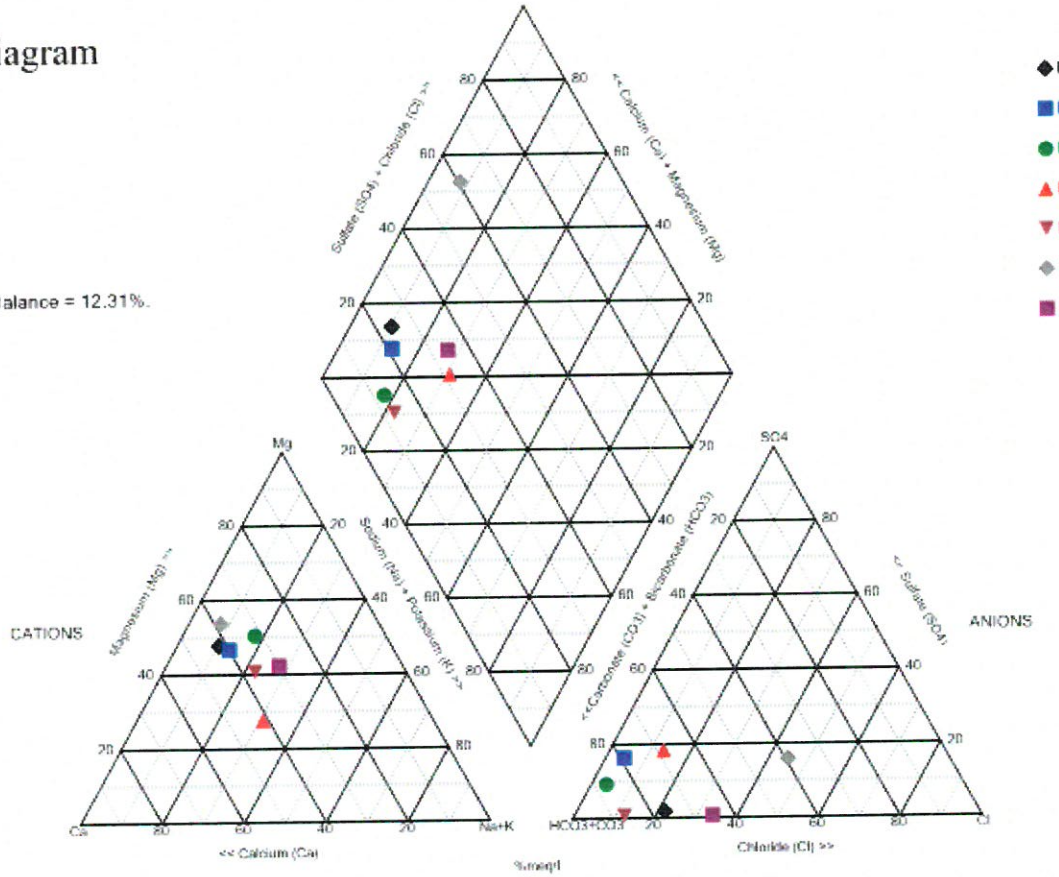
Analysis Run 3/4/2019 1:55 PM

Facility: inman Data File: inman regional organic results (1995-2018)

WQStat Plus™ v.9.4.41

Piper Diagram

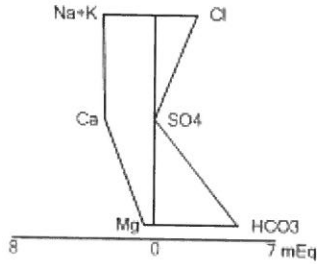
Cation-Anion Balance = 12.31%.



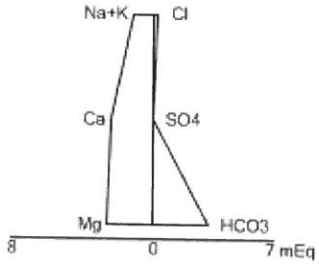
Analysis Run 3/4/2019 1:56 PM

Facility: inman Data File: inman regional organic results (1995-2018)

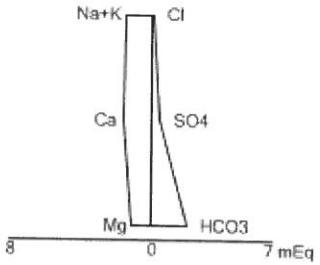
APPENDIX E-2:
Stiff Diagrams 2018 – Upper Regional Aquifer



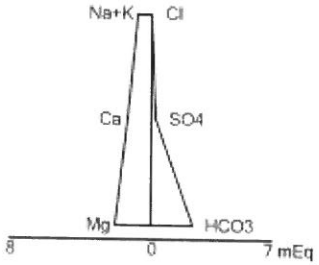
B-5 3/15/2018



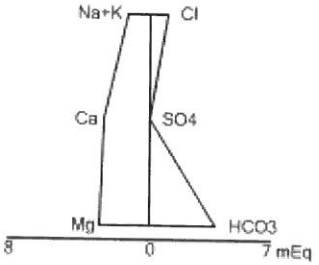
B-1 3/13/2018



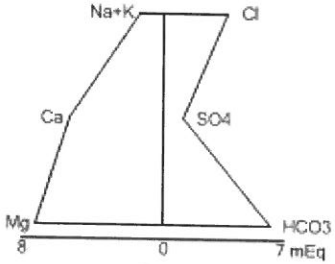
B-2 3/12/2018



B-12 3/12/2018



B-3 3/12/2018

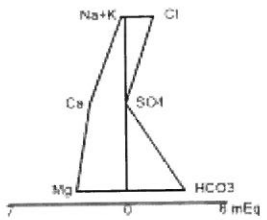


B-4 3/13/2018

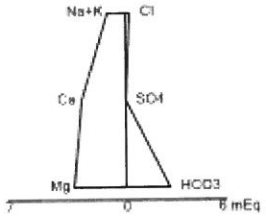
Stiff Diagram Analysis Run 3/5/2019 7:48 AM

Facility: Inman Landfill Data File: inman regional organic results (1995-2018)

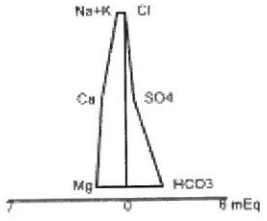
WQStat Plus™ v.9.4.41



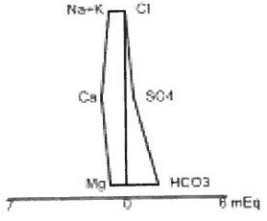
B-5 6/21/2018



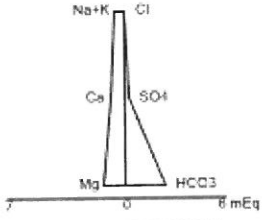
B-1 6/20/2018



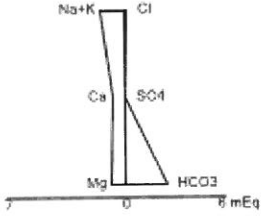
B-10 6/26/2018



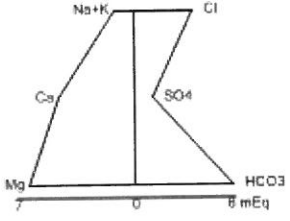
B-2 6/20/2018



B-12 6/19/2018



B-3 6/19/2018

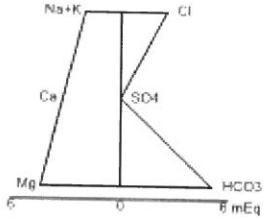


B-4 6/21/2018

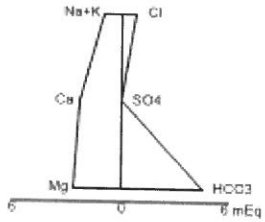
Stiff Diagram Analysis Run 3/5/2019 8:01 AM

Facility: Inman Landfill Data File: inman regional organic results (1995-2018)

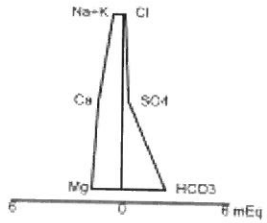
WQStat Plus™ v.9.4.41



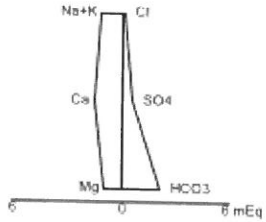
B-5 9/11/2018



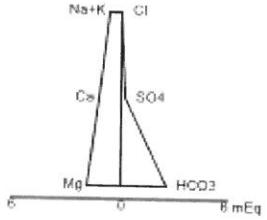
B-1 9/11/2018



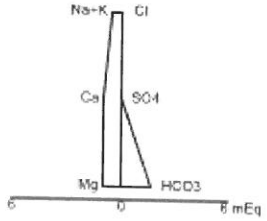
B-10 9/18/2018



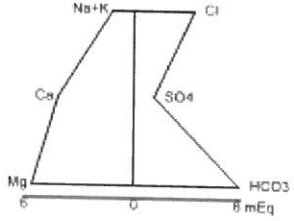
B-2 9/6/2018



B-12 9/10/2018



B-3 9/10/2018

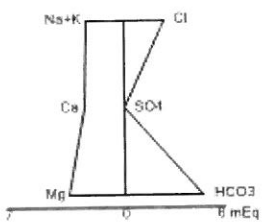


B-4 9/12/2018

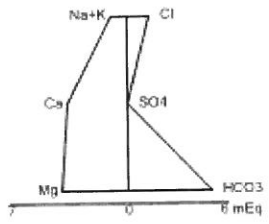
Stiff Diagram Analysis Run 3/5/2019 8:08 AM

Facility: Inman Landfill Data File: inman regional organic results (1995-2018)

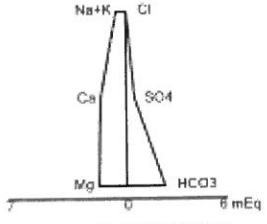
WQStat Plus™ v.9.4.41



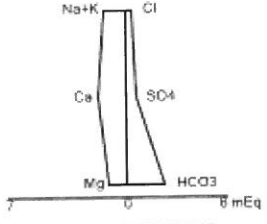
B-5 12/13/2018



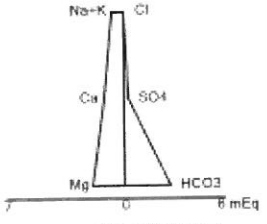
B-1 12/10/2018



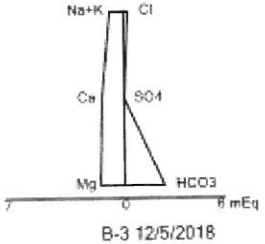
B-10 12/13/2018



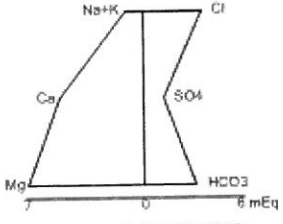
B-2 12/4/2018



B-12 12/5/2018



B-3 12/5/2018

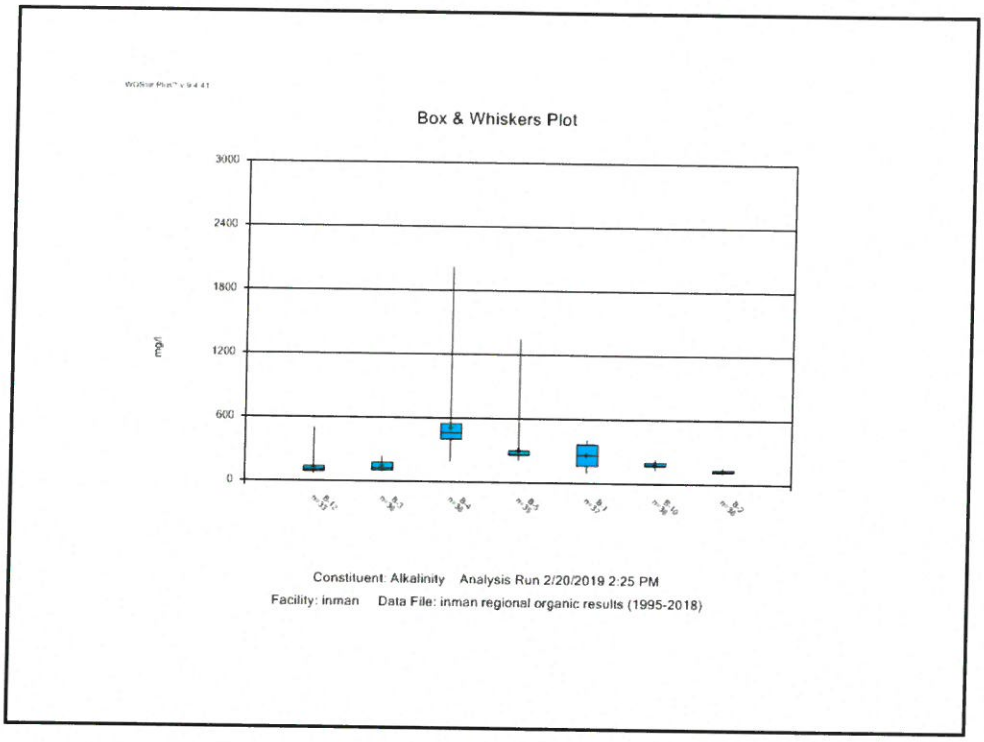


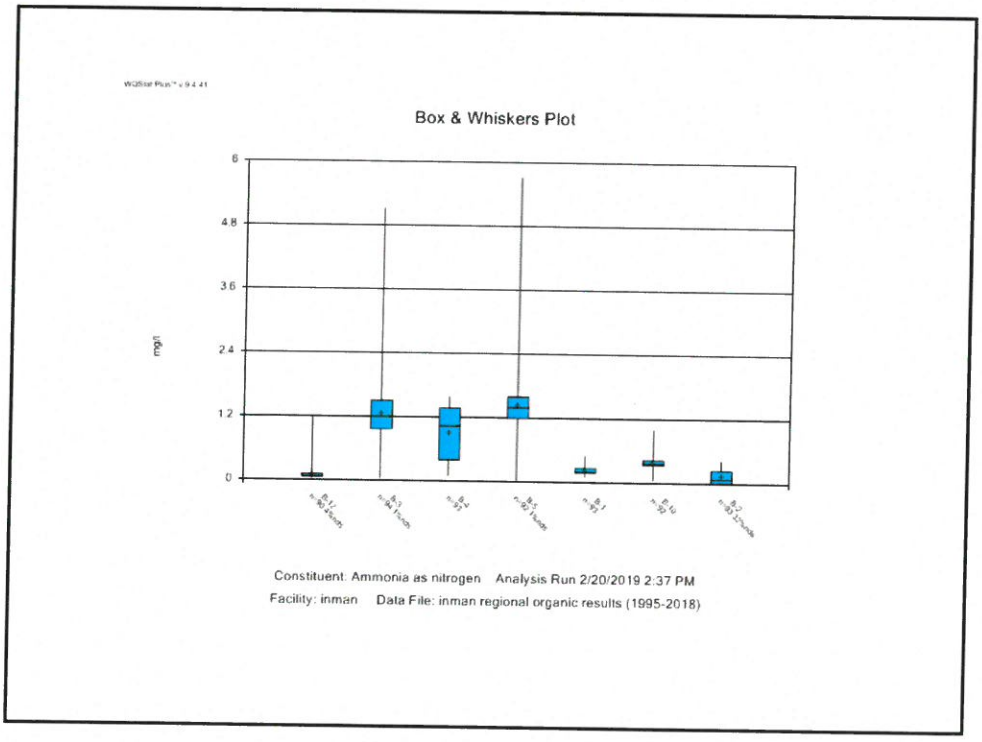
B-4 12/12/2018

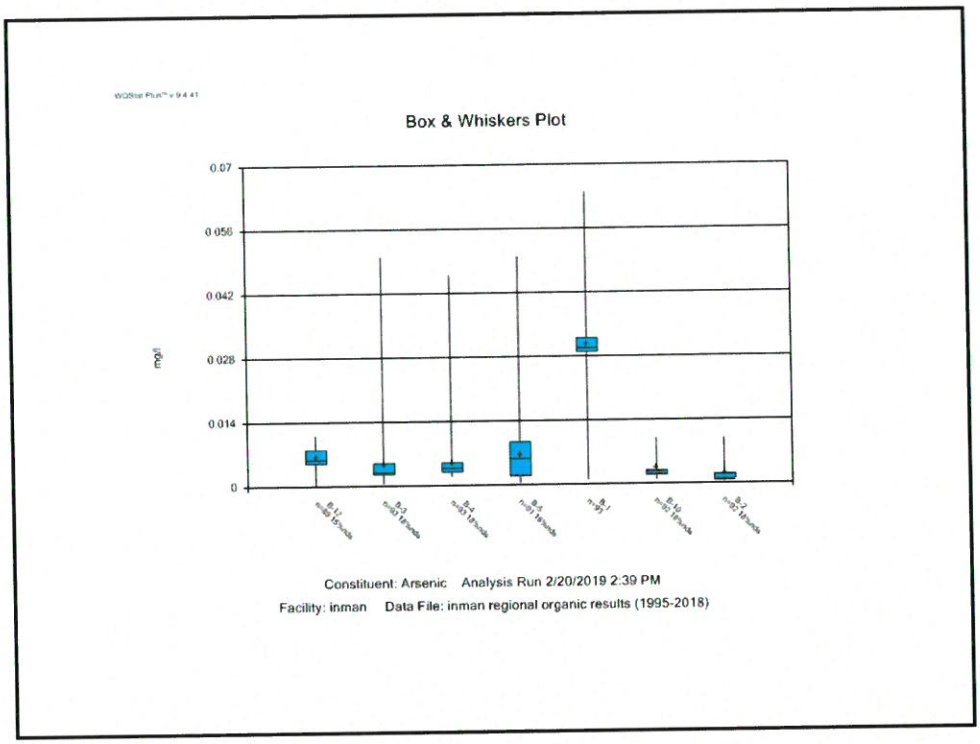
Stiff Diagram Analysis Run 3/5/2019 8:09 AM

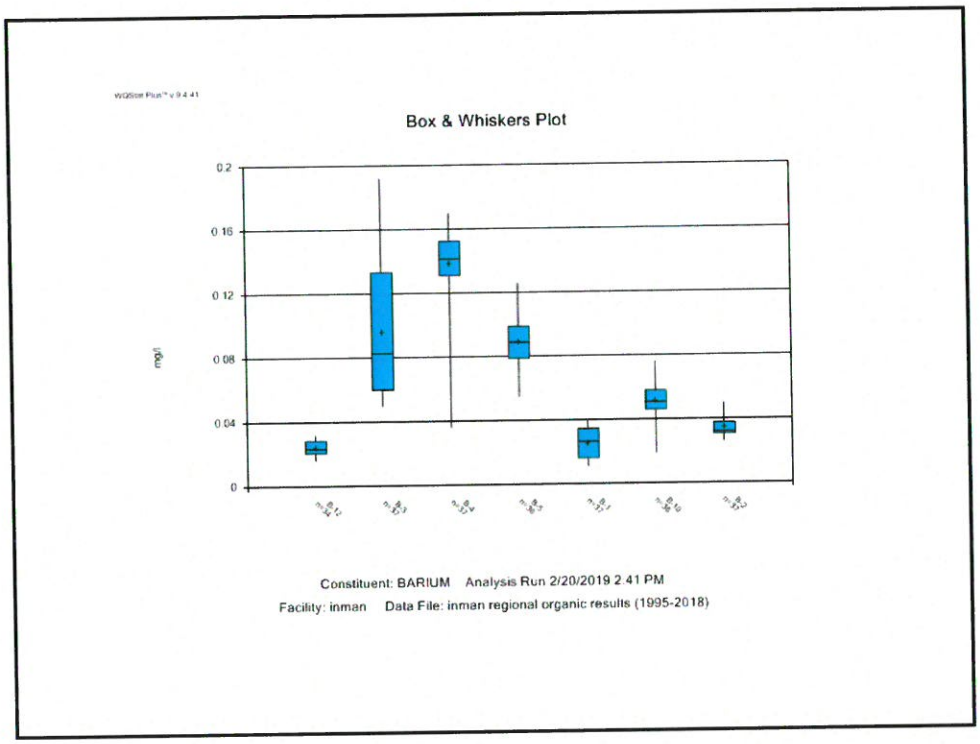
Facility: Inman Landfill Data File: inman regional organic results (1995-2018)

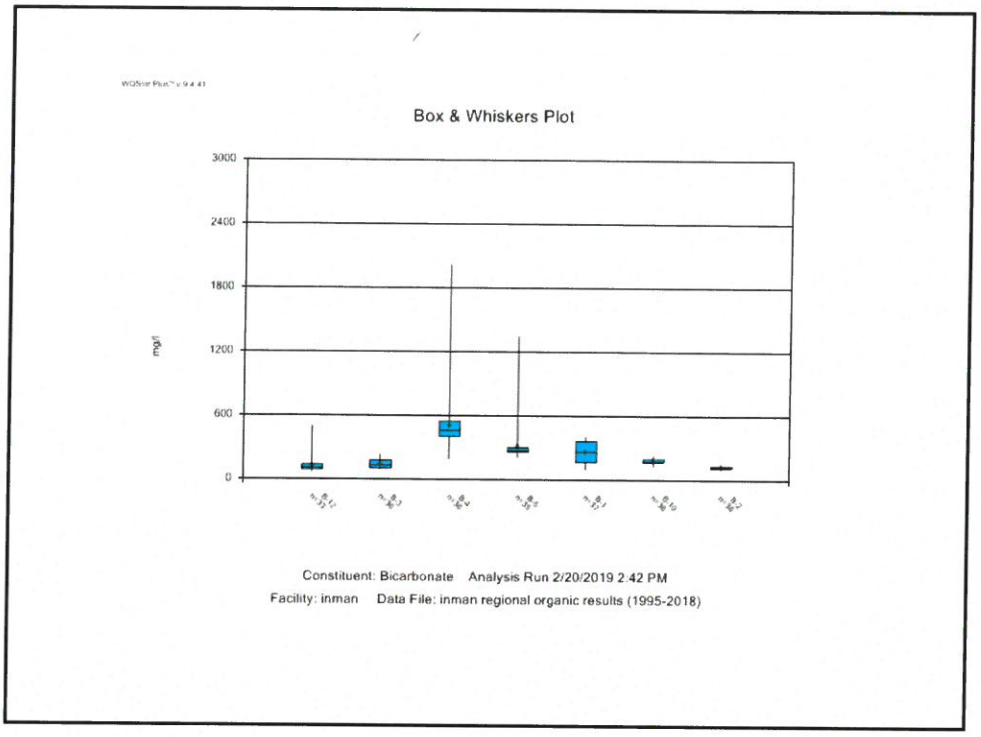
APPENDIX E-3:
Box Plots 1994-2018 – Upper Regional Aquifer

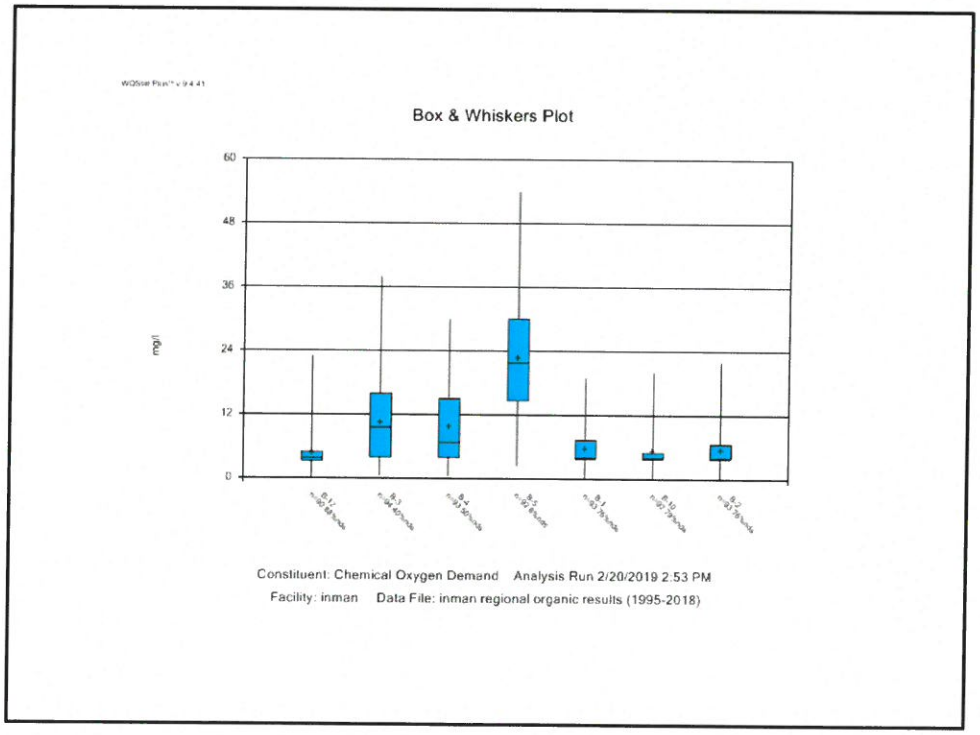

Box & Whiskers Plot
3000
2400
1800
1200
600
0
mg/l
Constituent: Alkalinity Analysis Run 2/20/2019 2:25 PM
Facility: inman Data File: inman regional organic results (1995-2018)

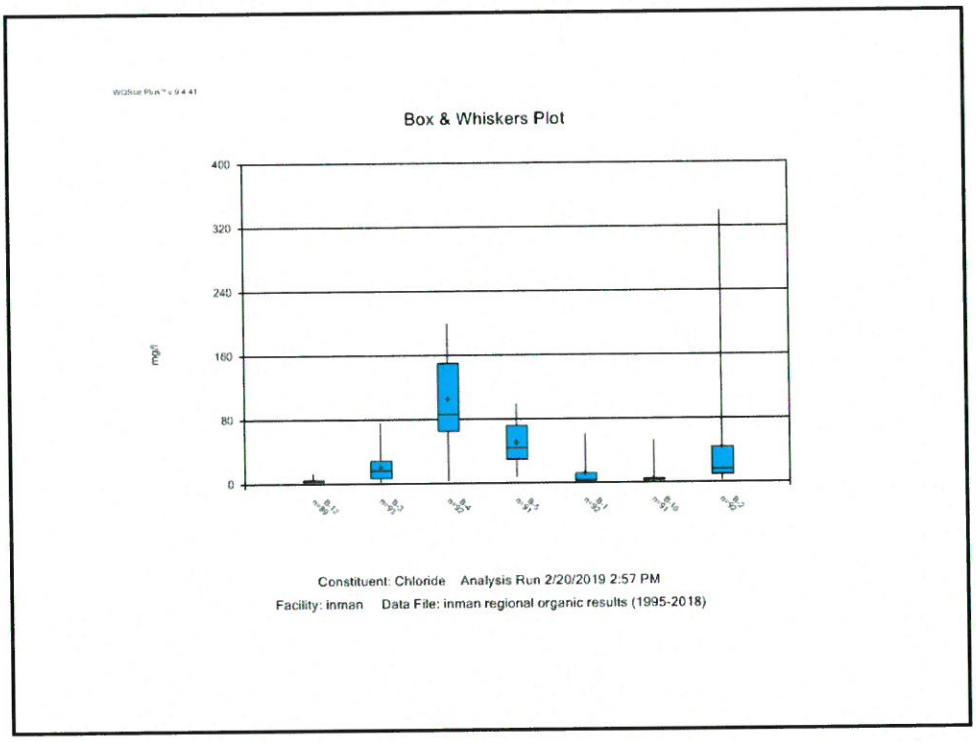

Box & Whiskers Plot
6
4.8
3.6
2.4
1.2
0
mg/l
Constituent: Ammonia as nitrogen Analysis Run 2/20/2019 2:37 PM
Facility: inman Data File: inman regional organic results (1995-2018)

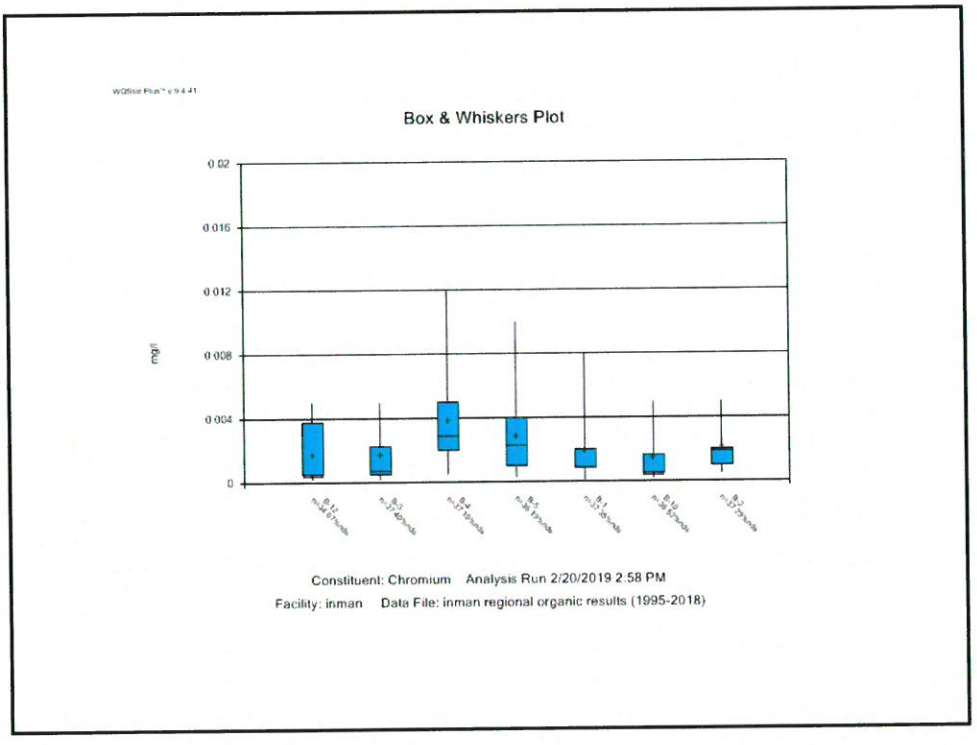

Box & Whiskers Plot
0.07
0.056
0.042
0.028
0.014
0
mg/l
Constituent: Arsenic Analysis Run 2/20/2019 2:39 PM
Facility: inman Data File: inman regional organic results (1995-2018)

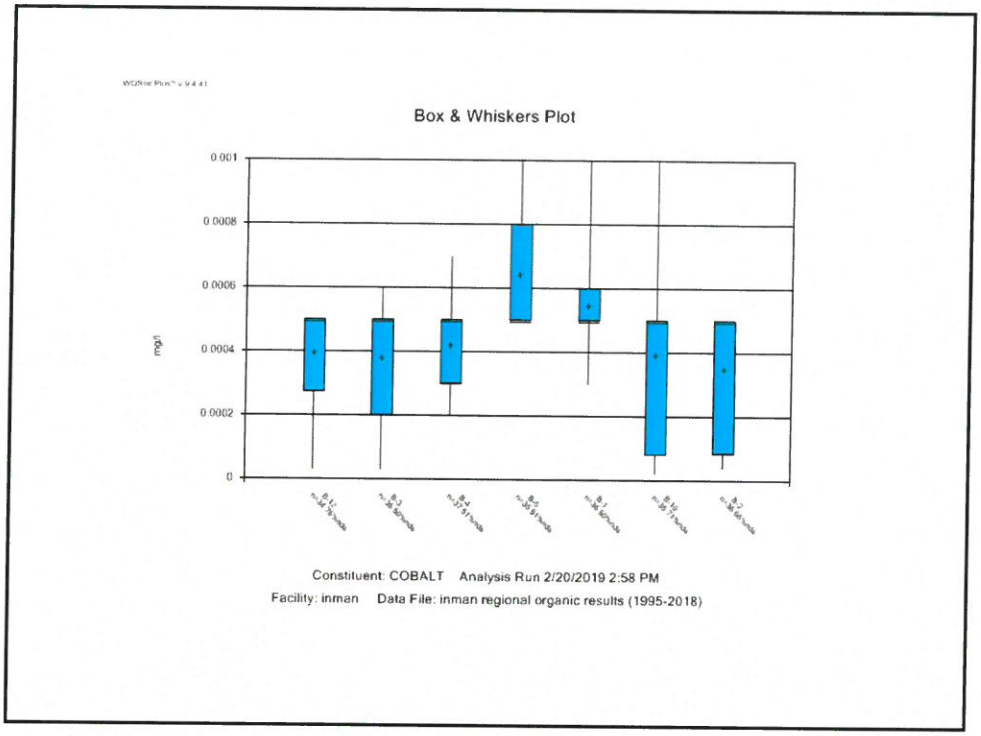

Box & Whiskers Plot
0.2
0.16
0.12
0.08
0.04
0
mg/l
Constituent: BARIUM Analysis Run 2/20/2019 2:41 PM
Facility: inman Data File: inman regional organic results (1995-2018)

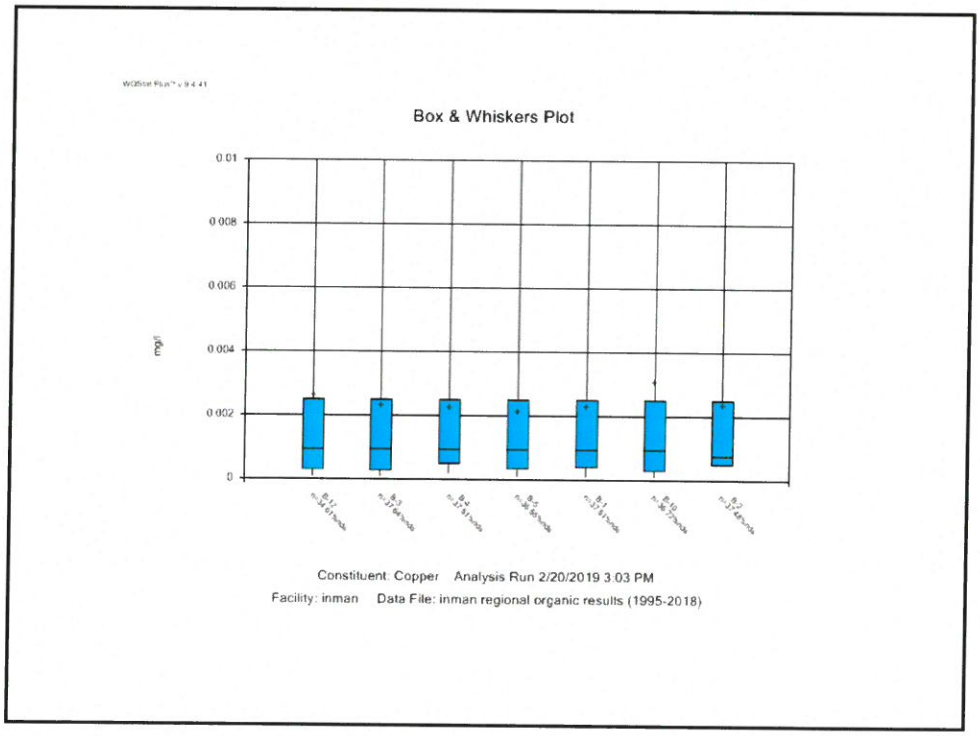

Box & Whiskers Plot
3000
2400
1800
1200
600
0
mg/l
Constituent: Bicarbonate Analysis Run 2/20/2019 2:42 PM
Facility: inman Data File: inman regional organic results (1995-2018)

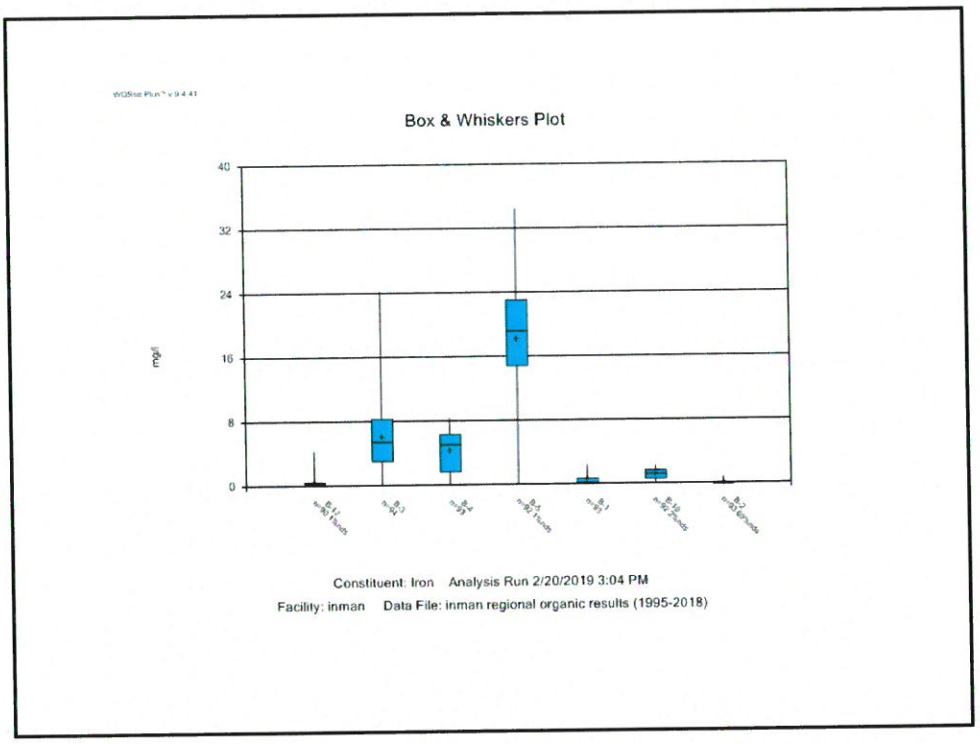

Box & Whiskers Plot
60
48
36
24
12
0
mg/l
Constituent: Chemical Oxygen Demand Analysis Run 2/20/2019 2:53 PM
Facility: inman Data File: inman regional organic results (1995-2018)

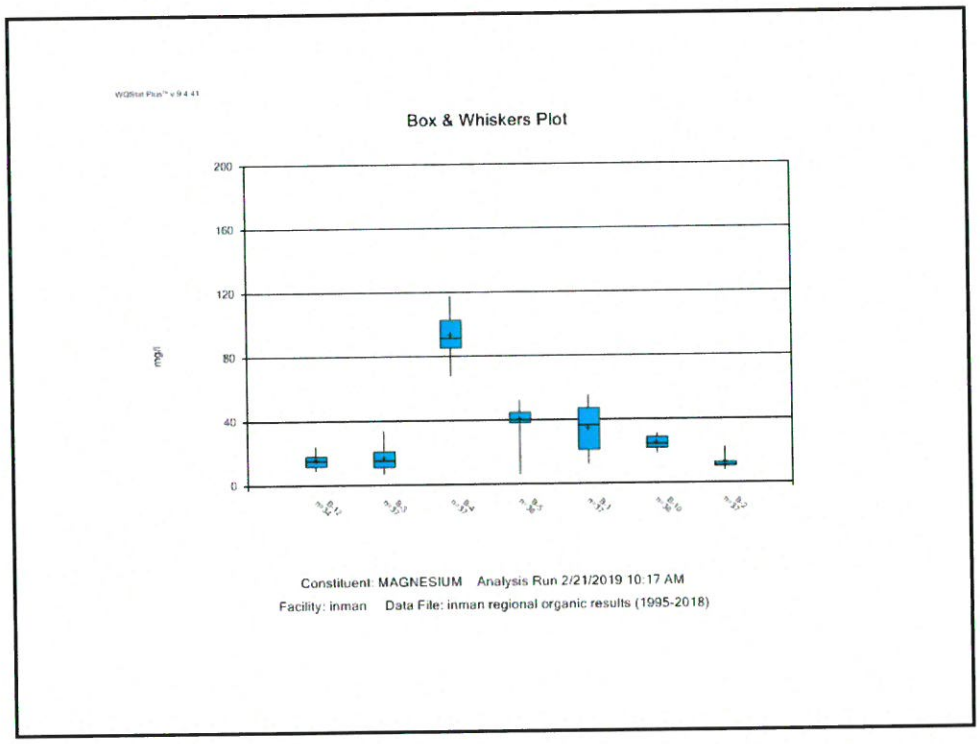

Box & Whiskers Plot
400
320
240
160
80
0
mg/l
Constituent: Chloride Analysis Run 2/20/2019 2:57 PM
Facility: inman Data File: inman regional organic results (1995-2018)

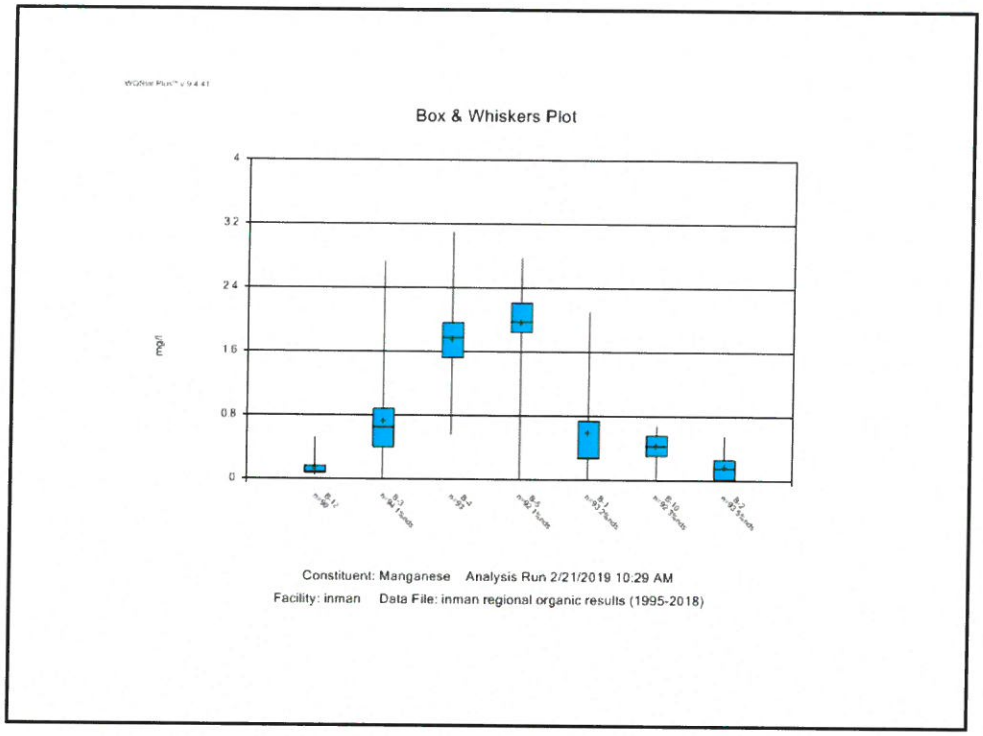

Box & Whiskers Plot
0.02
0.016
0.012
0.008
0.004
0
mg/l
Constituent: Chromium Analysis Run 2/20/2019 2:58 PM
Facility: inman Data File: inman regional organic results (1995-2018)

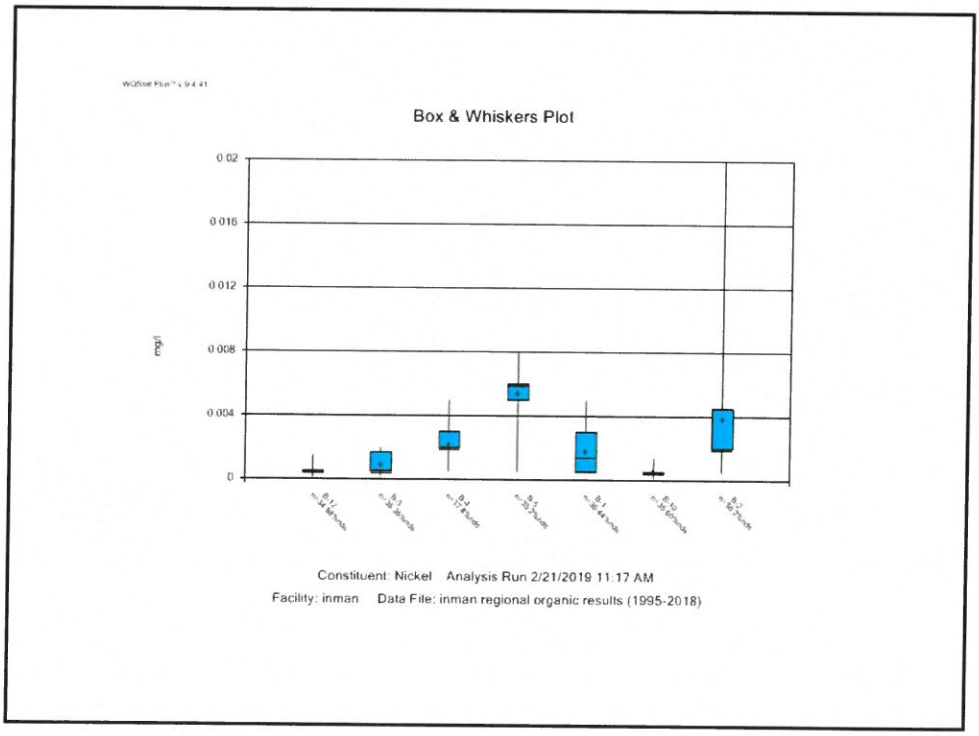

Box & Whiskers Plot
0.001
0.0008
0.0006
0.0004
0.0002
0
mg/l
Constituent: COBALT Analysis Run 2/20/2019 2:58 PM
Facility: inman Data File: inman regional organic results (1995-2018)

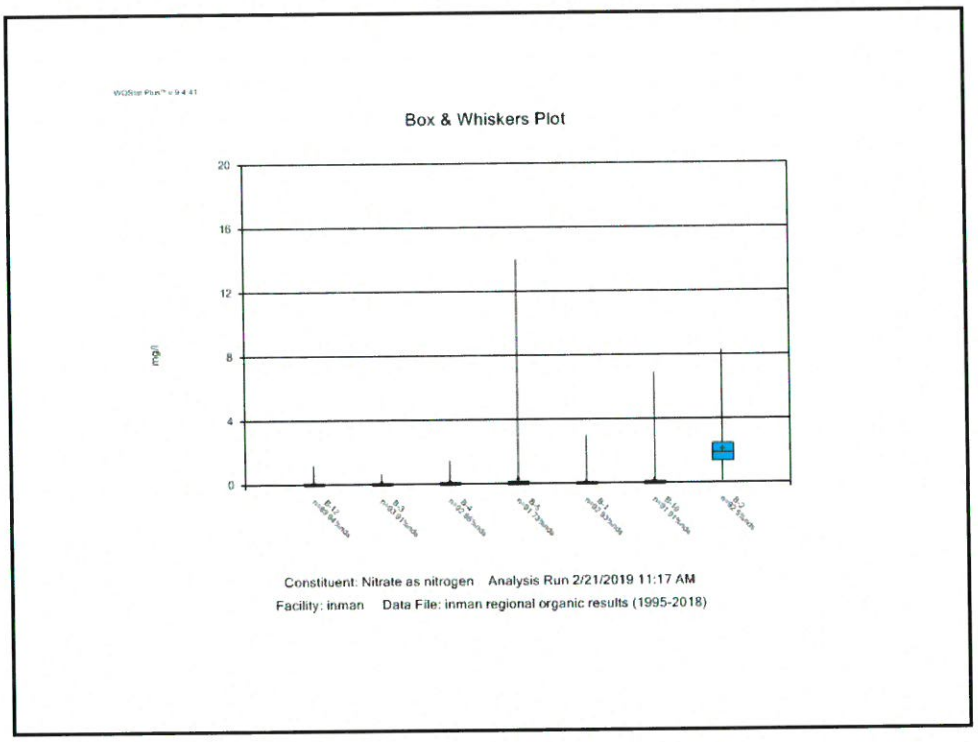

Box & Whiskers Plot
0.01
0.008
0.006
0.004
0.002
0
mg/l
Constituent: Copper Analysis Run 2/20/2019 3:03 PM
Facility: inman Data File: inman regional organic results (1995-2018)

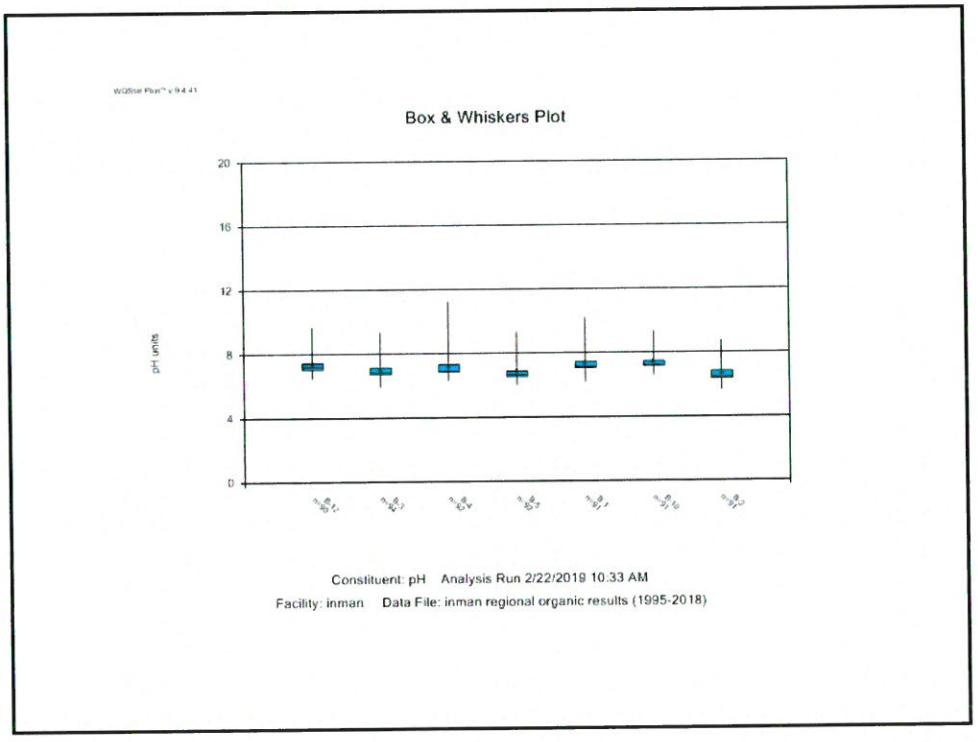

Box & Whiskers Plot
mg/l
40
32
24
16
8
0
Constituent: Iron Analysis Run 2/20/2019 3:04 PM
Facility: inman Data File: inman regional organic results (1995-2018)

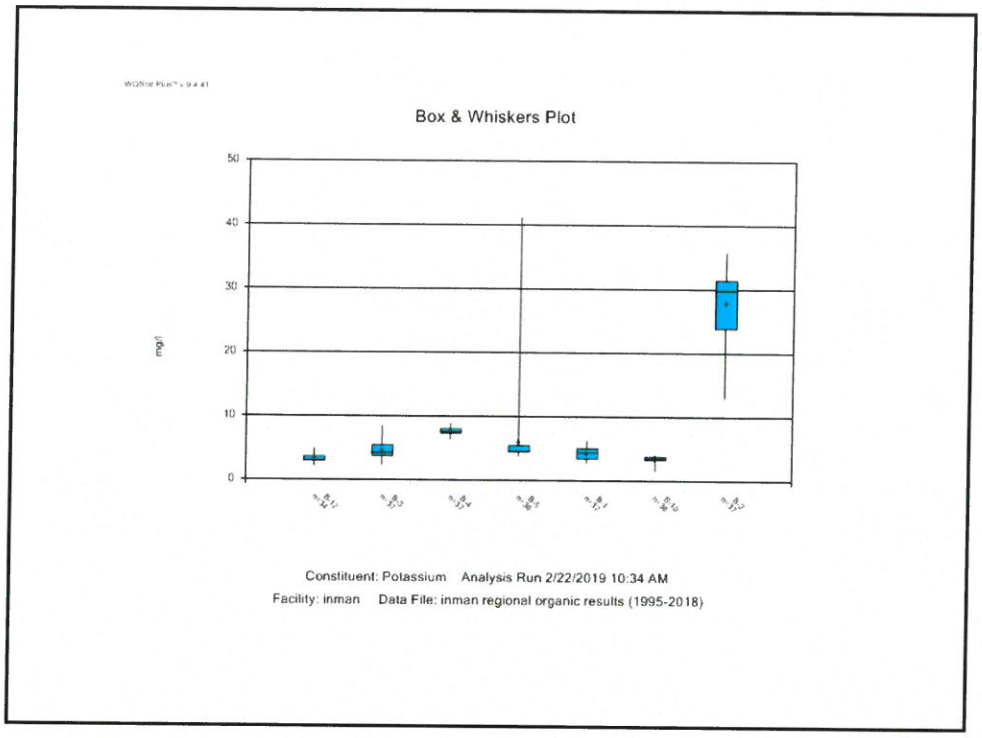

Box & Whiskers Plot
mg/l
200
160
120
80
40
0
Constituent: MAGNESIUM Analysis Run 2/21/2019 10:17 AM
Facility: inman Data File: inman regional organic results (1995-2018)

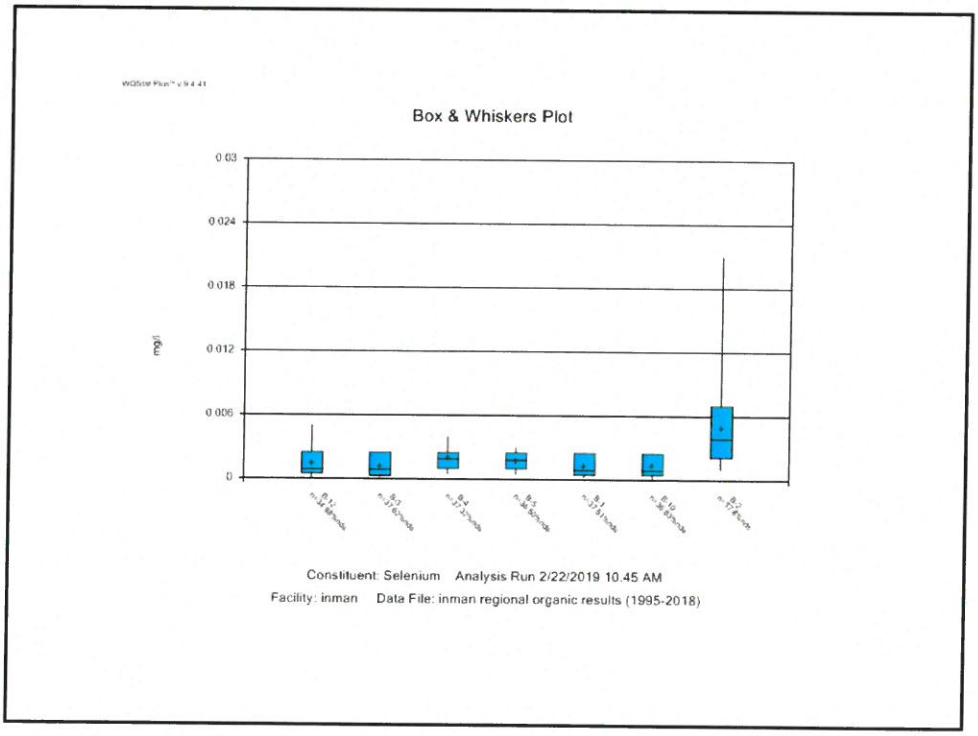

Box & Whiskers Plot
mg/l
4
3.2
2.4
1.6
0.8
0
Constituent: Manganese Analysis Run 2/21/2019 10:29 AM
Facility: inman Data File: inman regional organic results (1995-2018)

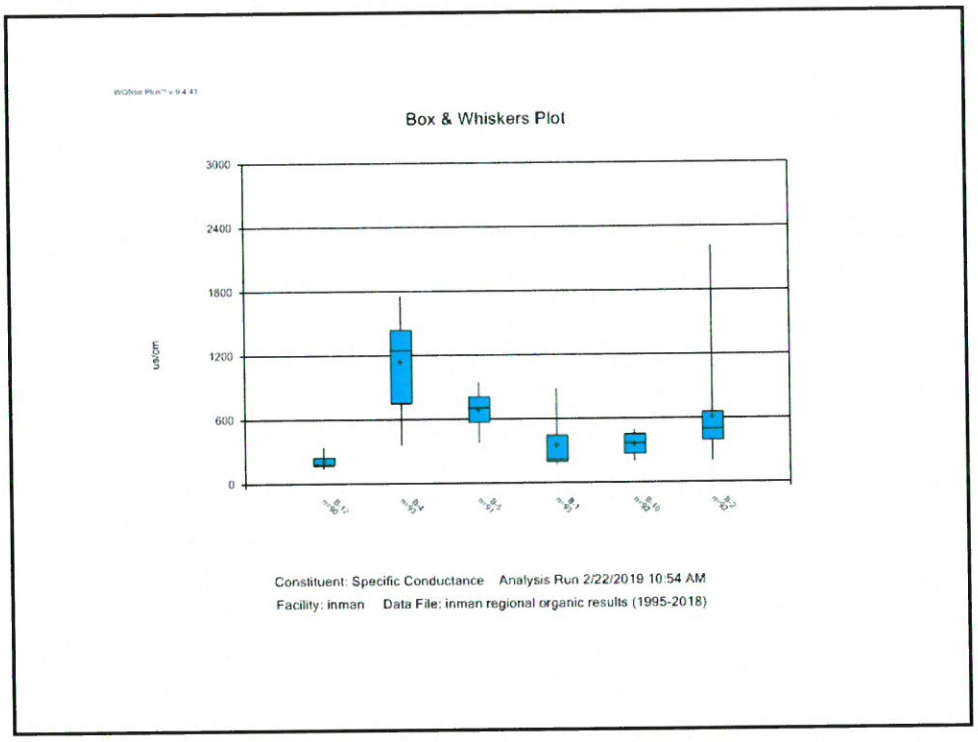

Box & Whiskers Plot
mg/l
0.02
0.016
0.012
0.008
0.004
0
Constituent: Nickel Analysis Run 2/21/2019 11:17 AM
Facility: inman Data File: inman regional organic results (1995-2018)

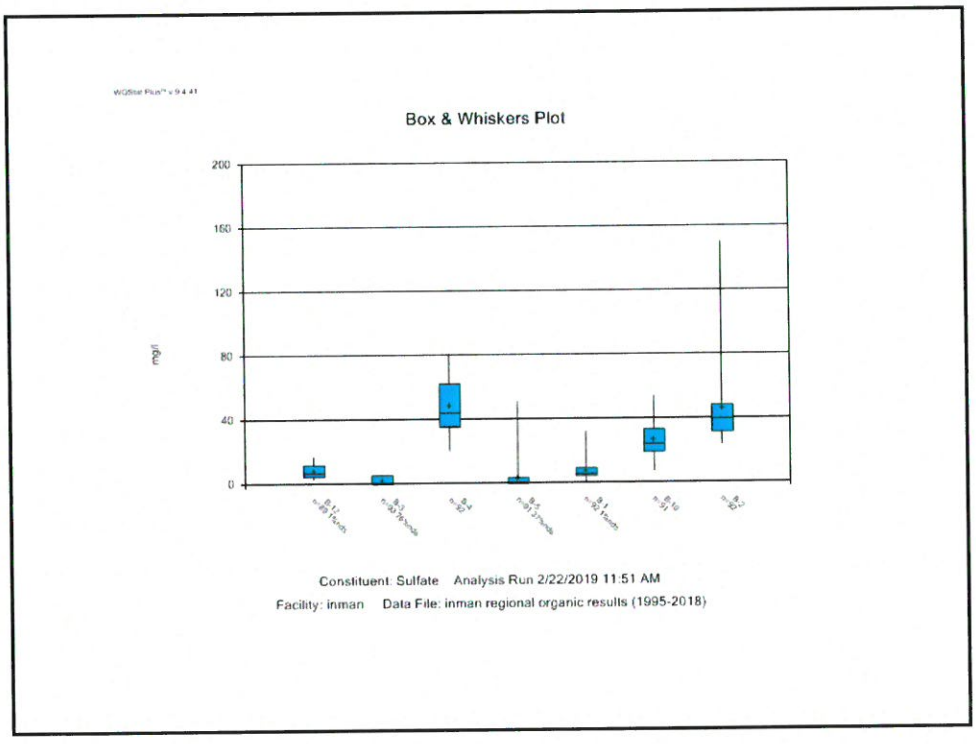

Box & Whiskers Plot
mg/l
20
16
12
8
4
0
Constituent: Nitrate as nitrogen Analysis Run 2/21/2019 11:17 AM
Facility: inman Data File: inman regional organic results (1995-2018)

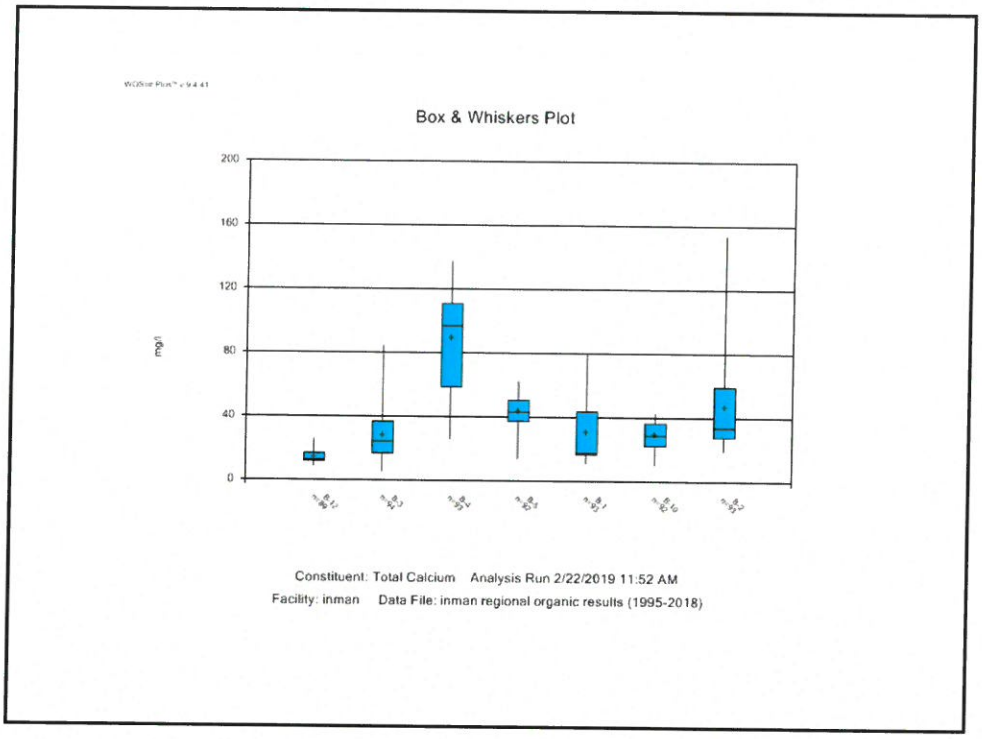

Box & Whiskers Plot
pH units
20
16
12
8
4
0
Constituent: pH Analysis Run 2/22/2019 10:33 AM
Facility: inman Data File: inman regional organic results (1995-2018)

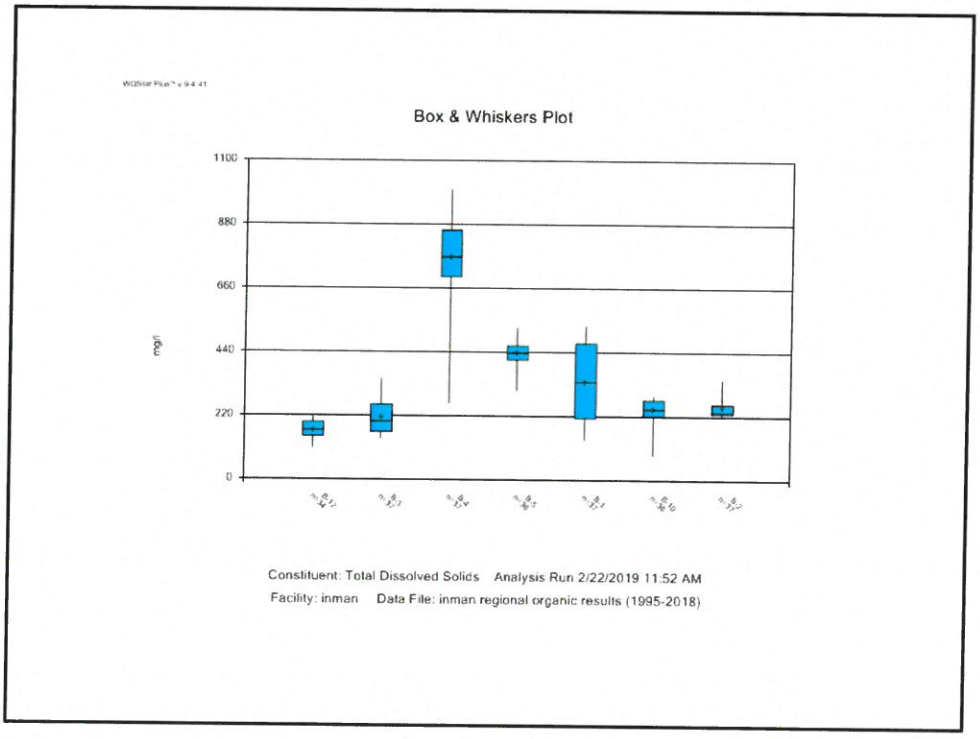

Box & Whiskers Plot
mg/l
50
40
30
20
10
0
Constituent: Potassium Analysis Run 2/22/2019 10:34 AM
Facility: inman Data File: inman regional organic results (1995-2018)

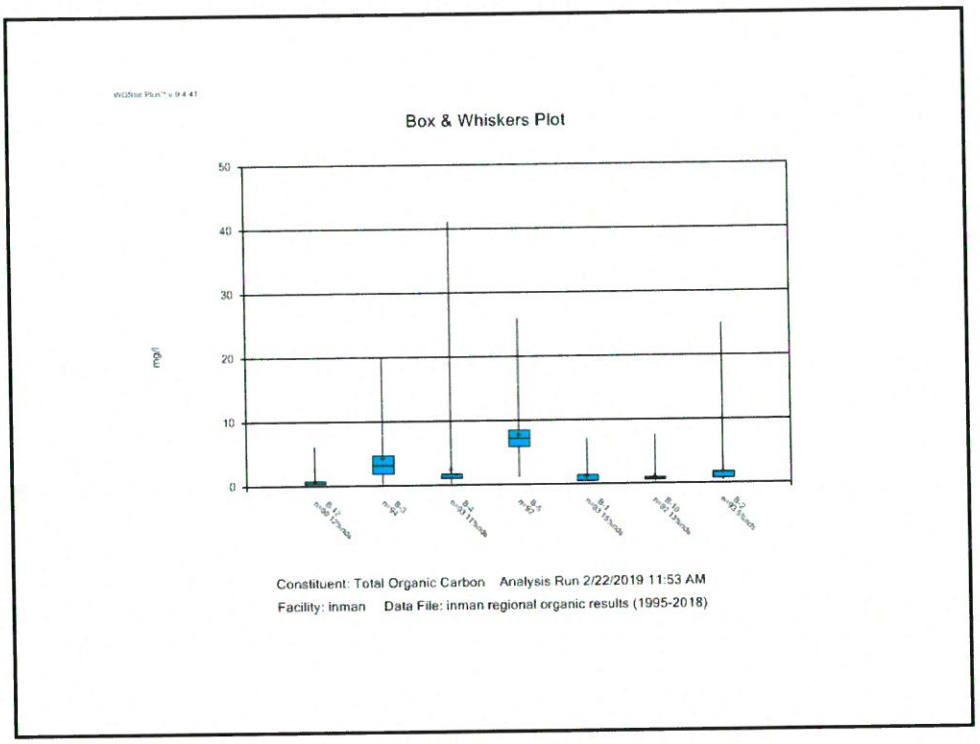

Box & Whiskers Plot
mg/l
0.03
0.024
0.018
0.012
0.006
0
Constituent: Selenium Analysis Run 2/22/2019 10:45 AM
Facility: inman Data File: inman regional organic results (1995-2018)

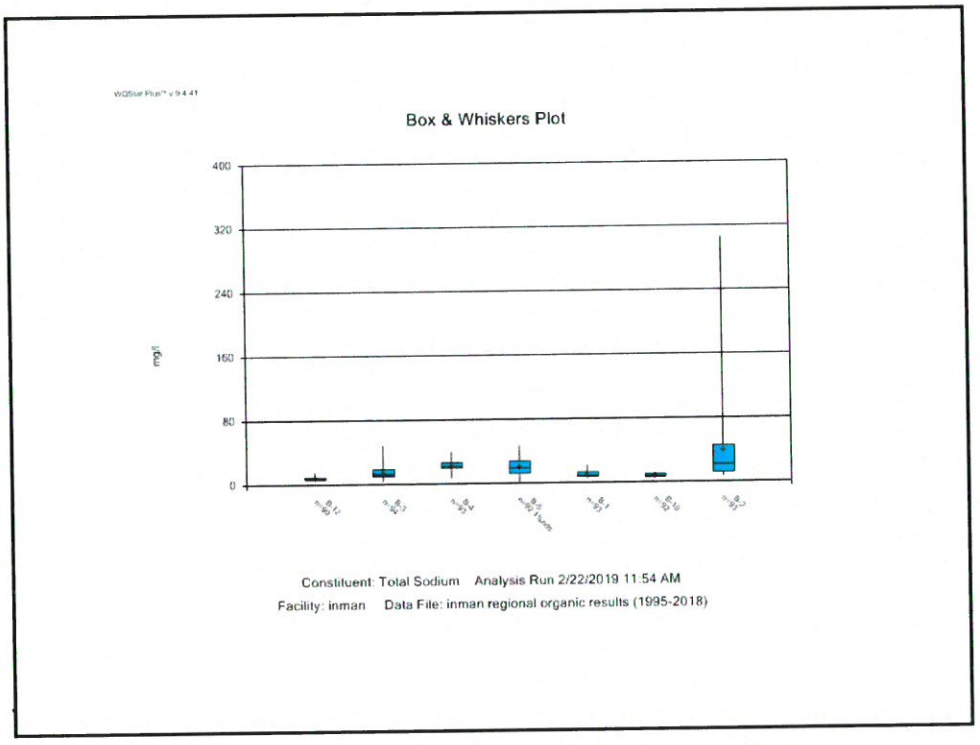

Box & Whiskers Plot
3000
2400
1800
1200
600
0
us/cm
Constituent: Specific Conductance Analysis Run 2/22/2019 10:54 AM
Facility: inman Data File: inman regional organic results (1995-2018)

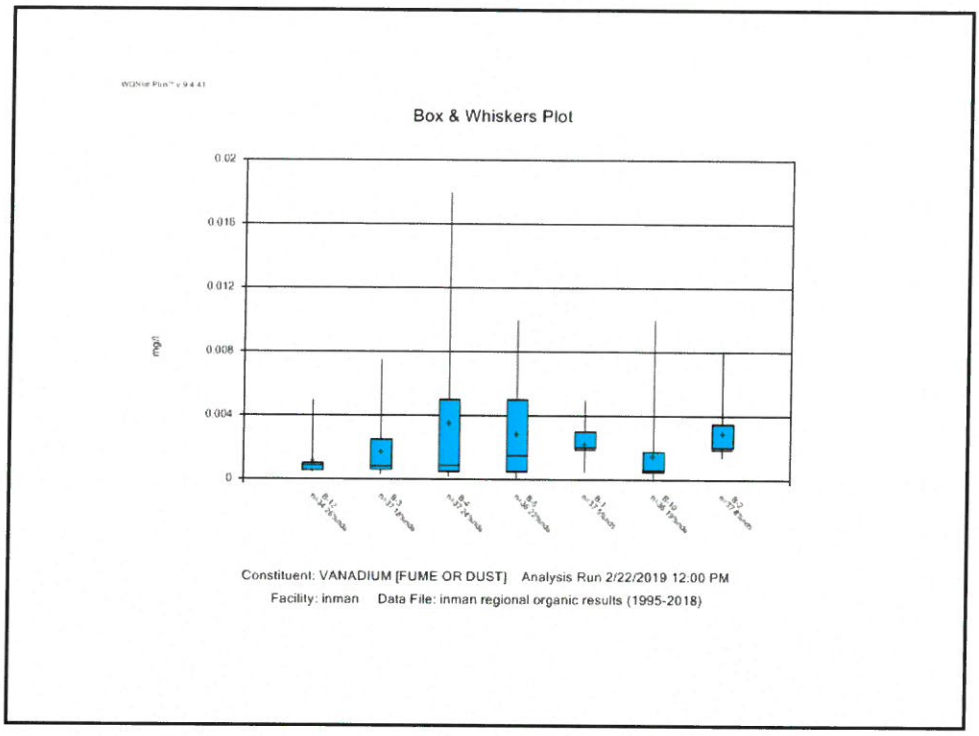

Box & Whiskers Plot
200
160
120
80
40
0
mg/l
Constituent: Sulfate Analysis Run 2/22/2019 11:51 AM
Facility: inman Data File: inman regional organic results (1995-2018)

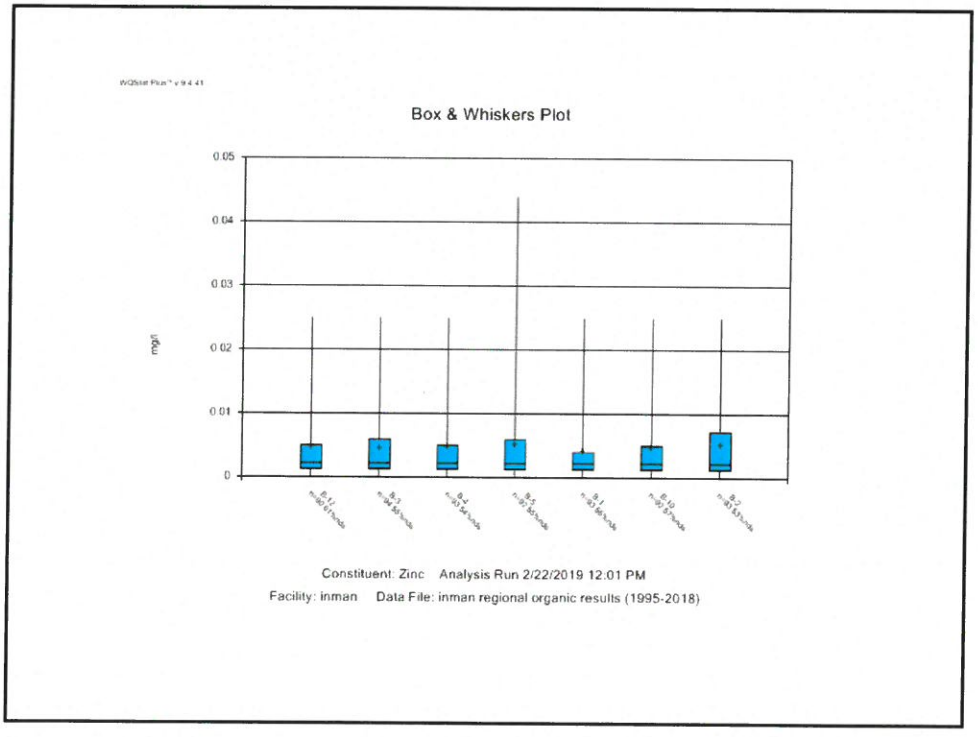

Box & Whiskers Plot
mg/l
200
160
120
80
40
0
Constituent: Total Calcium Analysis Run 2/22/2019 11:52 AM
Facility: inman Data File: inman regional organic results (1995-2018)

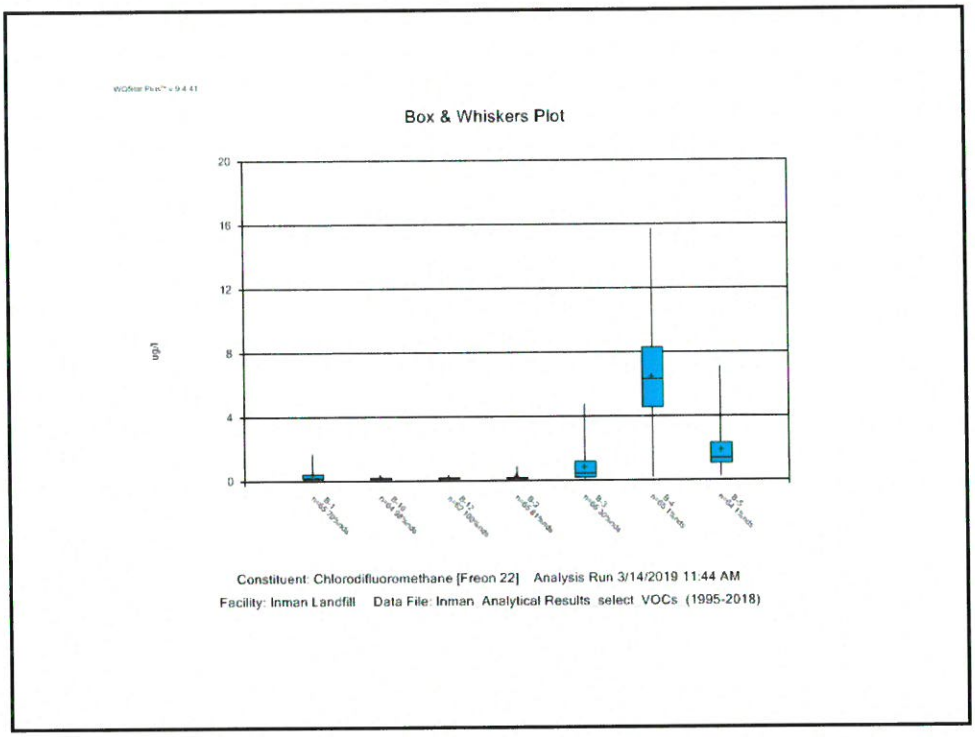

Box & Whiskers Plot
mg/l
1100
880
660
440
220
0
Constituent: Total Dissolved Solids Analysis Run 2/22/2019 11:52 AM
Facility: inman Data File: inman regional organic results (1995-2018)

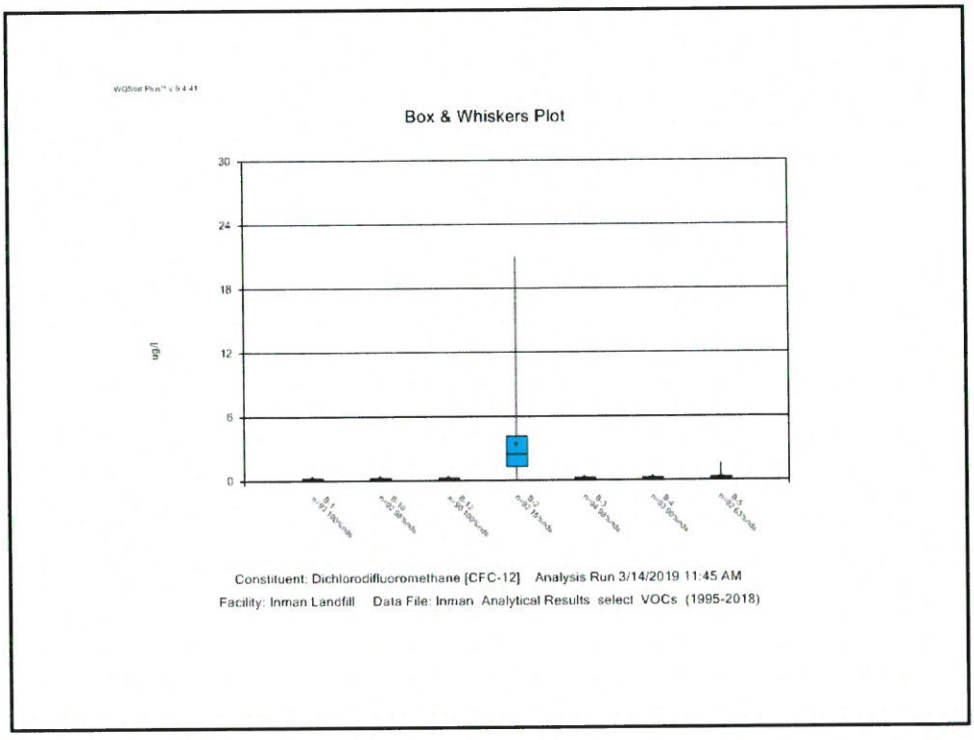

Box & Whiskers Plot
mg/l
50
40
30
20
10
0
Constituent: Total Organic Carbon Analysis Run 2/22/2019 11:53 AM
Facility: inman Data File: inman regional organic results (1995-2018)

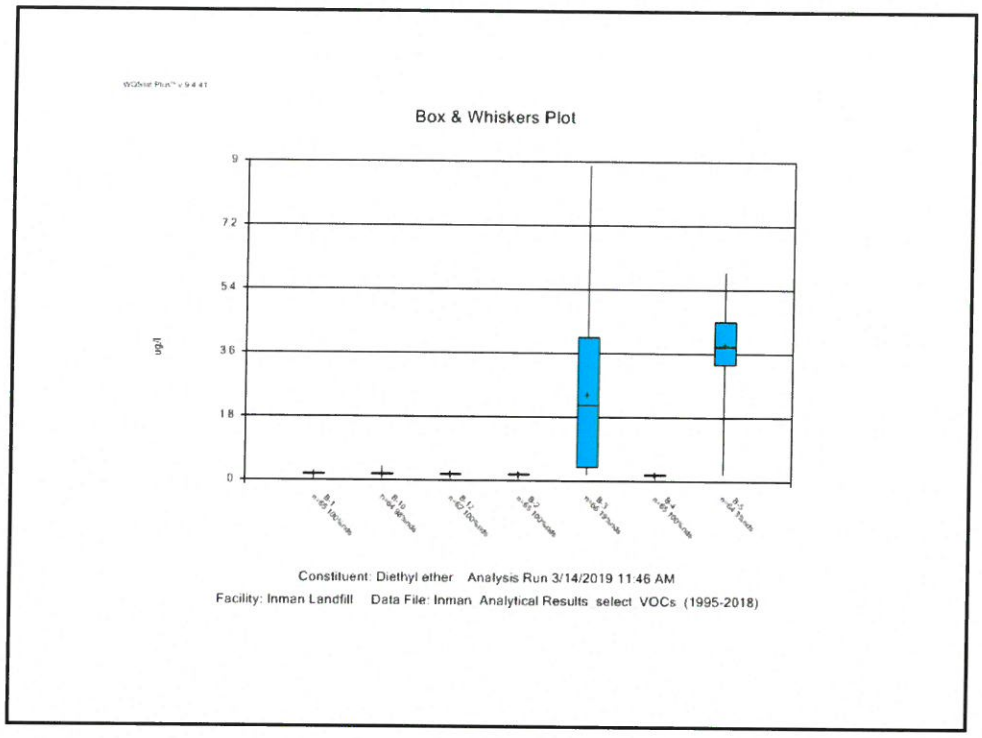

Box & Whiskers Plot
mg/l
400
320
240
160
80
0
Constituent: Total Sodium Analysis Run 2/22/2019 11:54 AM
Facility: inman Data File: inman regional organic results (1995-2018)

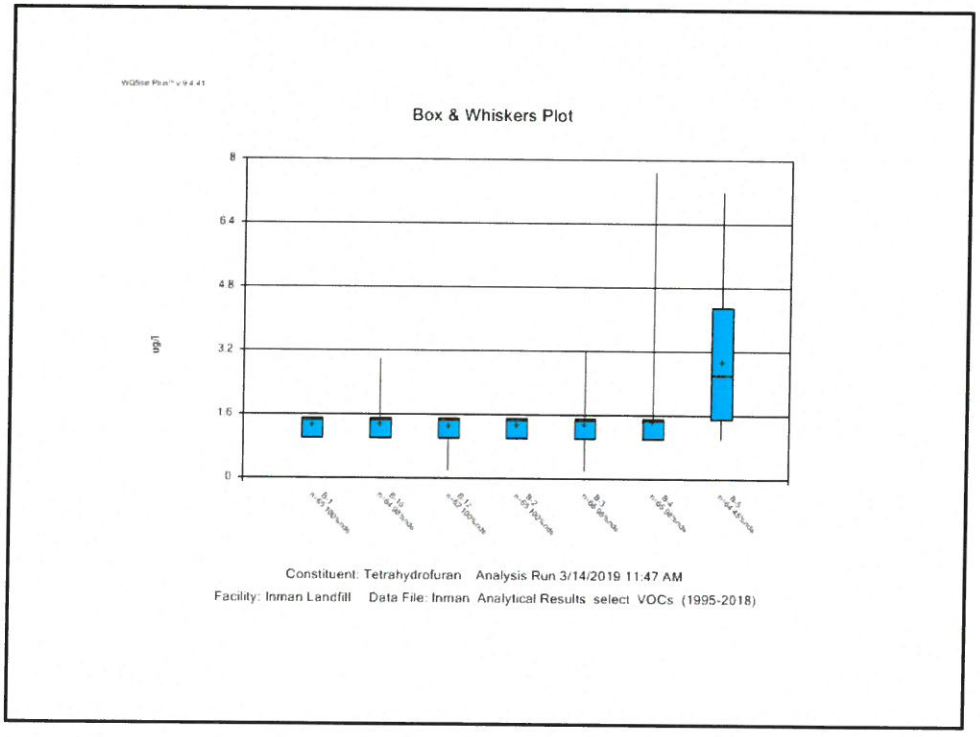

Box & Whiskers Plot
mg/l
0.02
0.016
0.012
0.008
0.004
0
Constituent: VANADIUM [FUME OR DUST] Analysis Run 2/22/2019 12.00 PM
Facility: inman Data File: inman regional organic results (1995-2018)

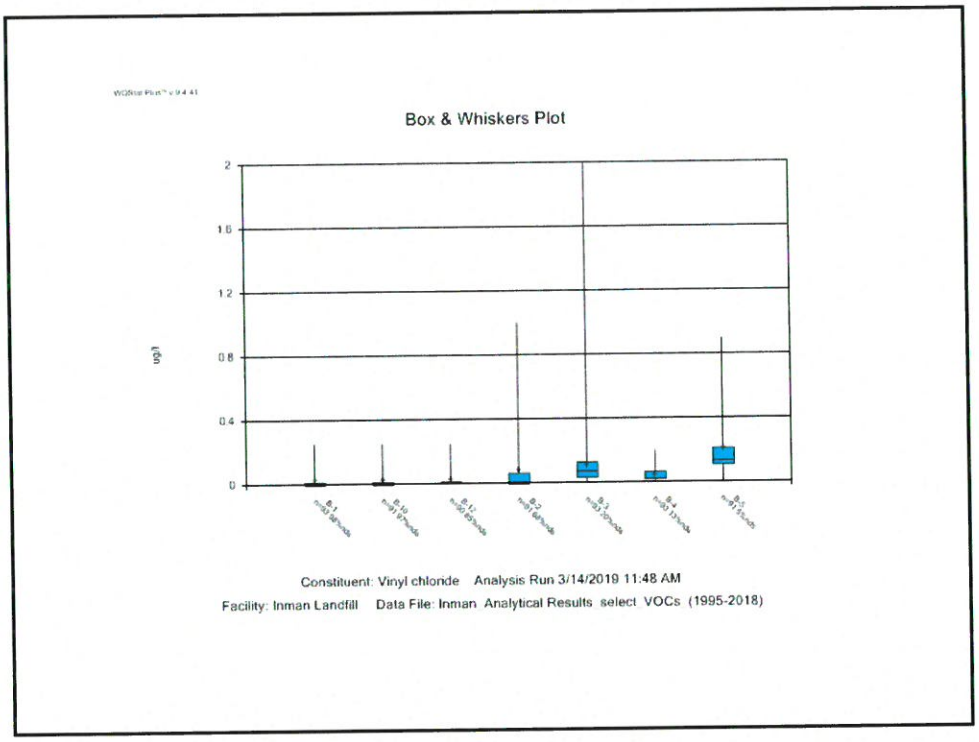

Box & Whiskers Plot
mg/l
0.05
0.04
0.03
0.02
0.01
0
Constituent: Zinc Analysis Run 2/22/2019 12.01 PM
Facility: inman Data File: inman regional organic results (1995-2018)


Box & Whiskers Plot
20
16
12
8
4
0
ug/l
Constituent: Chlorodifluoromethane [Freon 22] Analysis Run 3/14/2019 11:44 AM
Facility: Inman Landfill Data File: Inman Analytical Results select VOCs (1995-2018)


Box & Whiskers Plot
30
24
18
12
6
0
ug/l
Constituent: Dichlorodifluoromethane [CFC-12] Analysis Run 3/14/2019 11:45 AM
Facility: Inman Landfill Data File: Inman Analytical Results select VOCs (1995-2018)


Box & Whiskers Plot
9
7.2
5.4
3.6
1.8
0
ug/l
Constituent: Diethyl ether Analysis Run 3/14/2019 11:46 AM
Facility: Inman Landfill Data File: Inman Analytical Results select VOCs (1995-2018)


Box & Whiskers Plot
8
6.4
4.8
3.2
1.6
0
ug/l
Constituent: Tetrahydrofuran Analysis Run 3/14/2019 11:47 AM
Facility: Inman Landfill Data File: Inman Analytical Results select VOCs (1995-2018)


Box & Whiskers Plot
2
1.6
1.2
0.8
0.4
0
ug/l
B-1
n=30 38%nds
B-10
n=31 87%nds
B-12
n=30 83%nds
B-2
n=31 68%nds
B-3
n=31 0%nds
B-4
n=30 13%nds
B-5
n=31 0%nds
Constituent: Vinyl chloride Analysis Run 3/14/2019 11:48 AM
Facility: Inman Landfill Data File: Inman Analytical Results select VOCs (1995-2018)

APPENDIX E-4:
Long-Term Mann-Kendall Trend Tests 1994-2018 – Upper Regional Aquifer

Long-Term Mann-Kendall Trend Tests 1995-2018
Upper Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Significance Level
1,1-dichloroethane	ug/L	**B-1**	**0**	**-6.012**	**-2.33**	**Yes**	**93**	**100**	**0.02**
		B-2	**-0.01424**	**-9.388**	**-2.33**	**Yes**	**92**	**51.09**	**0.02**
		B-3	**0**	**-5.549**	**-2.33**	**Yes**	**94**	**96.81**	**0.02**
		B-4	0	-2.097	-2.33	No	93	50.54	0.02
		B-5	**0**	**-6.638**	**-2.33**	**Yes**	**92**	**75**	**0.02**
		B-10	**0**	**-5.898**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-12	**0**	**-5.657**	**-2.33**	**Yes**	**90**	**100**	**0.02**
1,2-dichloroethane	ug/L	**B-1**	**0**	**-6.012**	**-2.33**	**Yes**	**93**	**100**	**0.02**
		B-2	**0**	**-5.924**	**-2.33**	**Yes**	**92**	**100**	**0.02**
		B-3	**0**	**-5.831**	**-2.33**	**Yes**	**94**	**100**	**0.02**
		B-4	**0**	**-6.118**	**-2.33**	**Yes**	**93**	**98.92**	**0.02**
		B-5	**0**	**-6.35**	**-2.33**	**Yes**	**92**	**100**	**0.02**
		B-10	**0**	**-5.898**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-12	**0**	**-5.764**	**-2.33**	**Yes**	**90**	**98.89**	**0.02**
Acetone	ug/L	**B-1**	**0.06041**	**9.418**	**2.33**	**Yes**	**93**	**97.85**	**0.02**
		B-2	**0.06268**	**9.845**	**2.33**	**Yes**	**92**	**100**	**0.02**
		B-3	**0.05412**	**7.585**	**2.33**	**Yes**	**94**	**100**	**0.02**
		B-4	**0.06267**	**9.911**	**2.33**	**Yes**	**93**	**100**	**0.02**
		B-5	**0.06185**	**9.42**	**2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-10	**0.06577**	**9.943**	**2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-12	**0.06397**	**8.884**	**2.33**	**Yes**	**90**	**98.89**	**0.02**
Alkalinity	mg/L	**B-1**	**33.92**	**409**	**179**	**Yes**	**37**	**0**	**0.02**
		B-2	-0.5267	-71	-171	No	36	0	0.02
		B-3	-0.1786	-6	-171	No	36	0	0.02
		B-4	**-27.66**	**-517**	**-171**	**Yes**	**36**	**0**	**0.02**
		B-5	-1.596	-69	-166	No	35	0	0.02
		B-10	1.164	50	171	No	36	0	0.02
		B-12	**7.415**	**421**	**151**	**Yes**	**33**	**0**	**0.02**
Ammonia as nitrogen	mg/L	**B-1**	**0.006221**	**7.491**	**2.33**	**Yes**	**93**	**0**	**0.02**
		B-2	-0.0009409	-1.449	-2.33	No	93	32.26	0.02
		B-3	-0.001295	-0.3464	-2.33	No	94	1.064	0.02
		B-4	**0.06054**	**8.041**	**2.33**	**Yes**	**93**	**0**	**0.02**
		B-5	0.008821	1.579	2.33	No	92	1.087	0.02
		B-10	**0.003591**	**3.175**	**2.33**	**Yes**	**92**	**0**	**0.02**
		B-12	0.001174	2.151	2.33	No	90	4.444	0.02
Antimony, dissolved	mg/L	**B-1**	**-5.10E-12**	**-217**	**-171**	**Yes**	**36**	**72.22**	**0.02**
		B-2	**-0.0000239**	**-240**	**-171**	**Yes**	**36**	**77.78**	**0.02**
		B-3	0	-74	-171	No	36	94.44	0.02
		B-4	0	-164	-179	No	37	89.19	0.02
		B-5	**0**	**-187**	**-166**	**Yes**	**35**	**80**	**0.02**
		B-10	0	-23	-166	No	35	97.14	0.02
		B-12	**-0.00004536**	**-232**	**-158**	**Yes**	**34**	**76.47**	**0.02**
Arsenic, dissolved	mg/L	B-1	0	-0.1942	-2.33	No	93	0	0.02
		B-2	**-0.00003065**	**-8.241**	**-2.33**	**Yes**	**92**	**18.48**	**0.02**
		B-3	**-0.00008639**	**-3.635**	**-2.33**	**Yes**	**93**	**18.28**	**0.02**
		B-4	**-0.0001199**	**-4.647**	**-2.33**	**Yes**	**93**	**18.28**	**0.02**
		B-5	**-0.0002278**	**-3.816**	**-2.33**	**Yes**	**91**	**16.48**	**0.02**
		B-10	**-0.00006897**	**-5.927**	**-2.33**	**Yes**	**92**	**18.48**	**0.02**
		B-12	**-0.0002357**	**-7.657**	**-2.33**	**Yes**	**89**	**15.73**	**0.02**
Barium, dissolved	mg/L	**B-1**	**0.002808**	**468**	**179**	**Yes**	**37**	**0**	**0.02**
		B-2	**-0.0007464**	**-195**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-3	0.00009984	6	179	No	37	0	0.02
		B-4	**-0.00468**	**-272**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-5	0.0005706	46	171	No	36	0	0.02
		B-10	0.0009951	125	171	No	36	0	0.02
		B-12	**0.00132**	**489**	**158**	**Yes**	**34**	**0**	**0.02**

Long-Term Mann-Kendall Trend Tests 1995-2018
Upper Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Significance Level
Bicarbonate	mg/L	**B-1**	**33.82**	**411**	**179**	**Yes**	**37**	**0**	**0.02**
		B-2	-0.4202	-49	-171	No	36	0	0.02
		B-3	0.2519	10	171	No	36	0	0.02
		B-4	**-27.05**	**-513**	**-171**	**Yes**	**36**	**0**	**0.02**
		B-5	0.6474	22	166	No	35	0	0.02
		B-10	1.164	54	171	No	36	0	0.02
		B-12	**7.606**	**419**	**151**	**Yes**	**33**	**0**	**0.02**
Cadmium, dissolved	mg/L	**B-1**	**-0.00001524**	**-5.016**	**-2.33**	**Yes**	**91**	**95.6**	**0.02**
		B-2	**-0.00002979**	**-5.427**	**-2.33**	**Yes**	**91**	**86.81**	**0.02**
		B-3	**-8.192E-06**	**-3.923**	**-2.33**	**Yes**	**92**	**97.83**	**0.02**
		B-4	**-0.00001089**	**-4.751**	**-2.33**	**Yes**	**92**	**95.65**	**0.02**
		B-5	**-0.00001928**	**-5.005**	**-2.33**	**Yes**	**90**	**91.11**	**0.02**
		B-10	**-8.786E-06**	**-4.107**	**-2.33**	**Yes**	**90**	**97.78**	**0.02**
		B-12	**-0.00001287**	**-4.321**	**-2.33**	**Yes**	**89**	**93.26**	**0.02**
Chemical Oxygen Demand	mg/L	**B-1**	**0.09838**	**3.437**	**2.33**	**Yes**	**93**	**76.34**	**0.02**
		B-2	0	-0.1185	-2.33	No	93	76.34	0.02
		B-3	0	0.1675	2.33	No	94	40.43	0.02
		B-4	**0.6261**	**5.758**	**2.33**	**Yes**	**93**	**50.54**	**0.02**
		B-5	**1.116**	**7.694**	**2.33**	**Yes**	**92**	**6.522**	**0.02**
		B-10	0	2.122	2.33	No	92	79.35	0.02
		B-12	0	2.136	2.33	No	90	88.89	0.02
Chloride	mg/L	**B-1**	**0.5158**	**8.715**	**2.33**	**Yes**	**92**	**0**	**0.02**
		B-2	**-1.714**	**-6.717**	**-2.33**	**Yes**	**92**	**0**	**0.02**
		B-3	**-0.6259**	**-3.33**	**-2.33**	**Yes**	**93**	**0**	**0.02**
		B-4	**4.899**	**6.328**	**2.33**	**Yes**	**92**	**0**	**0.02**
		B-5	**3.013**	**10.89**	**2.33**	**Yes**	**91**	**0**	**0.02**
		B-10	**0.03725**	**2.705**	**2.33**	**Yes**	**91**	**0**	**0.02**
		B-12	0	0.6079	2.33	No	89	0	0.02
Chlorodifluoromethane (Freon 22)	ug/L	**B-1**	**0.01594**	**5.324**	**2.33**	**Yes**	**65**	**70.77**	**0.02**
		B-2	**0**	**-4.258**	**-2.33**	**Yes**	**65**	**81.54**	**0.02**
		B-3	-0.003138	-1.002	-2.33	No	66	30.3	0.02
		B-4	**0.3767**	**4.214**	**2.33**	**Yes**	**65**	**1.538**	**0.02**
		B-5	**-0.1318**	**-5.617**	**-2.33**	**Yes**	**64**	**1.563**	**0.02**
		B-10	0	-0.1288	-2.33	No	64	98.44	0.02
		B-12	0	1.675	2.33	No	62	100	0.02
Chloroethane	ug/L	**B-1**	**0**	**-5.664**	**-2.33**	**Yes**	**93**	**100**	**0.02**
		B-2	**0**	**-6.1**	**-2.33**	**Yes**	**91**	**95.6**	**0.02**
		B-3	**0**	**-5.707**	**-2.33**	**Yes**	**93**	**100**	**0.02**
		B-4	**0**	**-5.929**	**-2.33**	**Yes**	**93**	**98.92**	**0.02**
		B-5	**0**	**-6.241**	**-2.33**	**Yes**	**91**	**100**	**0.02**
		B-10	**0**	**-5.788**	**-2.33**	**Yes**	**91**	**98.9**	**0.02**
		B-12	**0**	**-5.657**	**-2.33**	**Yes**	**90**	**100**	**0.02**
Chromium, dissolved	mg/L	**B-1**	**-0.0001727**	**-196**	**-179**	**Yes**	**37**	**35.14**	**0.02**
		B-2	**-0.000172**	**-275**	**-179**	**Yes**	**37**	**29.73**	**0.02**
		B-3	**-0.0003156**	**-345**	**-179**	**Yes**	**37**	**40.54**	**0.02**
		B-4	**-0.0005033**	**-369**	**-179**	**Yes**	**37**	**10.81**	**0.02**
		B-5	**-0.0003442**	**-306**	**-171**	**Yes**	**36**	**19.44**	**0.02**
		B-10	**-0.00008085**	**-292**	**-171**	**Yes**	**36**	**52.78**	**0.02**
		B-12	**-0.00005821**	**-183**	**-158**	**Yes**	**34**	**67.65**	**0.02**
cis-1,2-dichloroethene	ug/L	**B-1**	**0**	**-6.012**	**-2.33**	**Yes**	**93**	**100**	**0.02**
		B-2	**0**	**-5.924**	**-2.33**	**Yes**	**92**	**100**	**0.02**
		B-3	**0**	**-5.365**	**-2.33**	**Yes**	**94**	**100**	**0.02**
		B-4	**0**	**-6.012**	**-2.33**	**Yes**	**93**	**100**	**0.02**
		B-5	**0**	**-6.35**	**-2.33**	**Yes**	**92**	**100**	**0.02**
		B-10	**0**	**-5.898**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-12	**0**	**-5.657**	**-2.33**	**Yes**	**90**	**100**	**0.02**

Long-Term Mann-Kendall Trend Tests 1995-2018
Upper Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Significance Level
Copper, dissolved	mg/L	**B-1**	**-0.0003343**	**-402**	**-179**	**Yes**	**37**	**51.35**	**0.02**
		B-2	**-0.0003061**	**-409**	**-179**	**Yes**	**37**	**48.65**	**0.02**
		B-3	**-0.0002999**	**-368**	**-179**	**Yes**	**37**	**64.86**	**0.02**
		B-4	**-0.0002908**	**-489**	**-179**	**Yes**	**37**	**51.35**	**0.02**
		B-5	**-0.0003281**	**-444**	**-171**	**Yes**	**36**	**55.56**	**0.02**
		B-10	**-0.0002838**	**-262**	**-171**	**Yes**	**36**	**72.22**	**0.02**
		B-12	**-0.0003286**	**-334**	**-158**	**Yes**	**34**	**61.76**	**0.02**
Dichlorodifluoromethane (CFC-12)	ug/L	**B-1**	**0**	**-6.012**	**-2.33**	**Yes**	**93**	**100**	**0.02**
		B-2	**-0.1912**	**-5.635**	**-2.33**	**Yes**	**92**	**15.22**	**0.02**
		B-3	**0**	**-5.848**	**-2.33**	**Yes**	**94**	**98.94**	**0.02**
		B-4	**0**	**-3.771**	**-2.33**	**Yes**	**93**	**90.32**	**0.02**
		B-5	**-0.003271**	**-7.105**	**-2.33**	**Yes**	**92**	**63.04**	**0.02**
		B-10	**0**	**-5.898**	**-2.33**	**Yes**	**92**	**98.91**	**0.02**
		B-12	**0**	**-5.657**	**-2.33**	**Yes**	**90**	**100**	**0.02**
Diethyl ether	ug/L	B-1	0	0.3666	2.33	No	65	100	0.02
		B-2	0	0.7063	2.33	No	65	100	0.02
		B-3	**-0.1074**	**-2.796**	**-2.33**	**Yes**	**66**	**19.7**	**0.02**
		B-4	0	0.3666	2.33	No	65	100	0.02
		B-5	-0.06132	-2.315	-2.33	No	64	3.125	0.02
		B-10	0	-0.1288	-2.33	No	64	98.44	0.02
		B-12	0	1.675	2.33	No	62	100	0.02
Iron, dissolved	mg/L	**B-1**	**0.03482**	**10.38**	**2.33**	**Yes**	**93**	**0**	**0.02**
		B-2	0	-1.464	-2.33	No	93	69.89	0.02
		B-3	**-0.1354**	**-2.443**	**-2.33**	**Yes**	**94**	**0**	**0.02**
		B-4	**0.2749**	**8.905**	**2.33**	**Yes**	**93**	**0**	**0.02**
		B-5	-0.04358	-0.4621	-2.33	No	92	1.087	0.02
		B-10	**0.07939**	**8.48**	**2.33**	**Yes**	**92**	**2.174**	**0.02**
		B-12	**0.008022**	**4.68**	**2.33**	**Yes**	**90**	**1.111**	**0.02**
Lead, dissolved	mg/L	**B-1**	**-0.00002878**	**-5.199**	**-2.33**	**Yes**	**92**	**91.3**	**0.02**
		B-2	**-1.003E-06**	**-3.931**	**-2.33**	**Yes**	**92**	**97.83**	**0.02**
		B-3	**-0.00002173**	**-3.947**	**-2.33**	**Yes**	**93**	**92.47**	**0.02**
		B-4	**-0.00002222**	**-4.581**	**-2.33**	**Yes**	**93**	**92.47**	**0.02**
		B-5	**-0.00001142**	**-3.854**	**-2.33**	**Yes**	**91**	**90.11**	**0.02**
		B-10	**0**	**-3.747**	**-2.33**	**Yes**	**91**	**96.7**	**0.02**
		B-12	**-0.00002107**	**-4.227**	**-2.33**	**Yes**	**90**	**91.11**	**0.02**
Magnesium, total	mg/L	**B-1**	**4.623**	**450**	**179**	**Yes**	**37**	**0**	**0.02**
		B-2	**-0.5691**	**-217**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-3	-0.05824	-22	-179	No	37	0	0.02
		B-4	**-2.034**	**-246**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-5	0.08258	16	171	No	36	0	0.02
		B-10	0.1492	31	171	No	36	0	0.02
		B-12	**1.104**	**444**	**158**	**Yes**	**34**	**0**	**0.02**
Manganese, dissolved	mg/L	**B-1**	**0.03462**	**10.11**	**2.33**	**Yes**	**93**	**2.151**	**0.02**
		B-2	**-0.00863**	**-4.793**	**-2.33**	**Yes**	**93**	**5.376**	**0.02**
		B-3	**-0.01999**	**-3.691**	**-2.33**	**Yes**	**94**	**1.064**	**0.02**
		B-4	0.001741	0.3054	2.33	No	93	0	0.02
		B-5	-0.009686	-1.994	-2.33	No	92	1.087	0.02
		B-10	**0.01566**	**6.503**	**2.33**	**Yes**	**92**	**3.261**	**0.02**
		B-12	**-0.004425**	**-6.046**	**-2.33**	**Yes**	**90**	**0**	**0.02**

Long-Term Mann-Kendall Trend Tests 1995-2018
Upper Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Significance Level
Mercury, dissolved	mg/L	B-1	0	-1.021	-2.33	No	92	100	0.02
		B-2	0	-1.021	-2.33	No	92	100	0.02
		B-3	0	-1.193	-2.33	No	93	98.92	0.02
		B-4	0	-0.8786	-2.33	No	92	98.91	0.02
		B-5	0	-0.9768	-2.33	No	91	100	0.02
		B-10	0	-0.7305	-2.33	No	88	97.73	0.02
		B-12	0	-1.497	-2.33	No	90	100	0.02
Nickel, dissolved	mg/L	**B-1**	**0.0002875**	**338**	**171**	**Yes**	**36**	**44.44**	**0.02**
		B-2	**-0.0003747**	**-315**	**-171**	**Yes**	**36**	**2.778**	**0.02**
		B-3	0	-45	-171	No	36	36.11	0.02
		B-4	0	-24	-179	No	37	8.108	0.02
		B-5	0	85	166	No	35	2.857	0.02
		B-10	0	-73	-166	No	35	60	0.02
		B-12	-2.40E-12	-138	-158	No	34	58.82	0.02
Nitrate as nitrogen	mg/L	B-1	0	-1.81	-2.33	No	92	93.48	0.02
		B-2	**-0.04026**	**-2.689**	**-2.33**	**Yes**	**92**	**5.435**	**0.02**
		B-3	0	-1.472	-2.33	No	93	91.4	0.02
		B-4	0	-1.058	-2.33	No	92	86.96	0.02
		B-5	0	1.026	2.33	No	91	73.63	0.02
		B-10	0	-1.919	-2.33	No	91	91.21	0.02
		B-12	0	-1.99	-2.33	No	89	94.38	0.02
Nitrite as nitrogen	mg/L	**B-1**	**0**	**2.965**	**2.33**	**Yes**	**92**	**100**	**0.02**
		B-2	0	2.099	2.33	No	92	96.74	0.02
		B-3	**0**	**3.738**	**2.33**	**Yes**	**93**	**94.62**	**0.02**
		B-4	**0**	**3.214**	**2.33**	**Yes**	**92**	**96.74**	**0.02**
		B-5	**0**	**2.404**	**2.33**	**Yes**	**91**	**93.41**	**0.02**
		B-10	**0**	**2.95**	**2.33**	**Yes**	**91**	**97.8**	**0.02**
		B-12	**0**	**2.553**	**2.33**	**Yes**	**89**	**97.75**	**0.02**
pH	mg/L	B-1	0.01004	1.773	2.33	No	91	0	0.02
		B-2	0	-0.072	-2.33	No	91	0	0.02
		B-3	**0.02638**	**4.639**	**2.33**	**Yes**	**94**	**0**	**0.02**
		B-4	-0.009509	-1.987	-2.33	No	92	0	0.02
		B-5	0.009162	1.981	2.33	No	92	0	0.02
		B-10	0.005651	1.297	2.33	No	91	0	0.02
		B-12	0.0109	2.172	2.33	No	90	0	0.02
Potassium, total	mg/L	**B-1**	**0.2524**	**364**	**179**	**Yes**	**37**	**0**	**0.02**
		B-2	**0.8303**	**231**	**179**	**Yes**	**37**	**0**	**0.02**
		B-3	0.0617	82	179	No	37	0	0.02
		B-4	-0.03586	-92	-179	No	37	0	0.02
		B-5	**0.1507**	**246**	**171**	**Yes**	**36**	**0**	**0.02**
		B-10	**0.05694**	**217**	**171**	**Yes**	**36**	**0**	**0.02**
		B-12	**0.1178**	**334**	**158**	**Yes**	**34**	**0**	**0.02**
Selenium, dissolved	mg/L	**B-1**	-0.000196	-308	-179	Yes	37	51.35	0.02
		B-2	-0.0006717	-335	-179	Yes	37	8.108	0.02
		B-3	-0.000228	-378	-179	Yes	37	62.16	0.02
		B-4	-0.000148	-283	-179	Yes	37	32.43	0.02
		B-5	-0.0001202	-262	-171	Yes	36	50	0.02
		B-10	-0.0001949	-247	-171	Yes	36	83.33	0.02
		B-12	-0.0001536	-230	-158	Yes	34	88.24	0.02
Specific Conductance	us/cm	**B-1**	**-0.000196**	**-308**	**-179**	**Yes**	**37**	**51.35**	**0.02**
		B-2	**-0.0006717**	**-335**	**-179**	**Yes**	**37**	**8.108**	**0.02**
		B-3	**-0.000228**	**-378**	**-179**	**Yes**	**37**	**62.16**	**0.02**
		B-4	**-0.000148**	**-283**	**-179**	**Yes**	**37**	**32.43**	**0.02**
		B-5	**-0.0001202**	**-262**	**-171**	**Yes**	**36**	**50**	**0.02**
		B-10	**-0.0001949**	**-247**	**-171**	**Yes**	**36**	**83.33**	**0.02**
		B-12	**-0.0001536**	**-230**	**-158**	**Yes**	**34**	**88.24**	**0.02**

Long-Term Mann-Kendall Trend Tests 1995-2018
Upper Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Significance Level
Sulfate	mg/L	B-1	0.1481	3.031	2.33	Yes	92	1.087	0.02
		B-2	-1.33	-6.873	-2.33	Yes	92	0	0.02
		B-3	0	-1.124	-2.33	No	93	76.34	0.02
		B-4	1.519	6.272	2.33	Yes	92	0	0.02
		B-5	-0.007264	-1.202	-2.33	No	91	37.36	0.02
		B-10	0.8147	7.132	2.33	Yes	91	0	0.02
		B-12	0.5474	10.14	2.33	Yes	89	1.124	0.02
Tetrachloroethene	ug/L	B-1	0	-6.012	-2.33	Yes	93	100	0.02
		B-2	0	-5.924	-2.33	Yes	92	100	0.02
		B-3	0	-5.365	-2.33	Yes	94	100	0.02
		B-4	0	-6.012	-2.33	Yes	93	100	0.02
		B-5	0	-6.35	-2.33	Yes	92	100	0.02
		B-10	0	-5.898	-2.33	Yes	92	98.91	0.02
		B-12	0	-5.657	-2.33	Yes	90	100	0.02
Tetrahydrofuran	ug/L	B-1	0	6.551	2.33	Yes	65	100	0.02
		B-2	0	6.551	2.33	Yes	65	100	0.02
		B-3	0	6.08	2.33	Yes	66	96.97	0.02
		B-4	0	6.182	2.33	Yes	65	98.46	0.02
		B-5	0.2139	5.674	2.33	Yes	64	45.31	0.02
		B-10	0	6.632	2.33	Yes	64	98.44	0.02
		B-12	0	5.787	2.33	Yes	62	100	0.02
Toluene	ug/L	B-1	0	-5.882	-2.33	Yes	93	100	0.02
		B-2	0	-5.798	-2.33	Yes	92	100	0.02
		B-3	0	-5.245	-2.33	Yes	94	100	0.02
		B-4	0	-5.882	-2.33	Yes	93	100	0.02
		B-5	0	-6.205	-2.33	Yes	92	100	0.02
		B-10	0	-5.762	-2.33	Yes	92	98.91	0.02
		B-12	0	-5.523	-2.33	Yes	90	100	0.02
Calcium, total	mg/L	B-1	1.673	8.359	2.33	Yes	93	0	0.02
		B-2	-2.184	-9.287	-2.33	Yes	93	0	0.02
		B-3	-0.567	-3.42	-2.33	Yes	94	0	0.02
		B-4	3.658	7.552	2.33	Yes	93	0	0.02
		B-5	0.7786	5.954	2.33	Yes	92	0	0.02
		B-10	0.893	6.983	2.33	Yes	92	0	0.02
		B-12	0.2678	4.419	2.33	Yes	89	0	0.02
Total Dissolved Solids	mg/L	B-1	42.08	435	179	Yes	37	0	0.02
		B-2	-5.454	-282	-179	Yes	37	0	0.02
		B-3	0.5109	17	179	No	37	0	0.02
		B-4	-27.54	-275	-179	Yes	37	0	0.02
		B-5	6.498	186	171	Yes	36	0	0.02
		B-10	3.161	85	171	No	36	0	0.02
		B-12	8.612	497	158	Yes	34	0	0.02
Total Organic Carbon	mg/L	B-1	0.03295	3.914	2.33	Yes	93	15.05	0.02
		B-2	-0.05915	-7.64	-2.33	Yes	93	5.376	0.02
		B-3	-0.1761	-4.733	-2.33	Yes	94	0	0.02
		B-4	0.05901	7.792	2.33	Yes	93	11.83	0.02
		B-5	0.09616	2.327	2.33	No	92	0	0.02
		B-10	0.01709	5.192	2.33	Yes	92	13.04	0.02
		B-12	-0.01874	-4.473	-2.33	Yes	90	12.22	0.02
Trichloroethene	ug/L	B-1	0	-6.012	-2.33	Yes	93	100	0.02
		B-2	0	-5.924	-2.33	Yes	92	100	0.02
		B-3	0	-5.831	-2.33	Yes	94	100	0.02
		B-4	0	-6.012	-2.33	Yes	93	100	0.02
		B-5	0	-6.35	-2.33	Yes	92	100	0.02
		B-10	0	-5.898	-2.33	Yes	92	98.91	0.02
		B-12	0	-5.657	-2.33	Yes	90	100	0.02

Long-Term Mann-Kendall Trend Tests 1995-2018
Upper Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Significance Level
Trichlorofluoromethane (CFC-11)	ug/L	B-1	0	-6.012	-2.33	Yes	93	100	0.02
		B-2	0	-1.033	-2.33	No	92	69.57	0.02
		B-3	0	-5.072	-2.33	Yes	94	98.94	0.02
		B-4	0	-6.012	-2.33	Yes	93	100	0.02
		B-5	0	-6.35	-2.33	Yes	92	100	0.02
		B-10	0	-5.898	-2.33	Yes	92	98.91	0.02
		B-12	0	-5.657	-2.33	Yes	90	100	0.02
Sodium, total	mg/L	B-1	0.3191	7.041	2.33	Yes	93	0	0.02
		B-2	-2.667	-11.4	-2.33	Yes	93	0	0.02
		B-3	-0.5205	-5.243	-2.33	Yes	94	0	0.02
		B-4	0.288	3.31	2.33	Yes	93	0	0.02
		B-5	1.178	10.54	2.33	Yes	92	1.087	0.02
		B-10	0.1166	5.624	2.33	Yes	92	0	0.02
		B-12	0.148	6.279	2.33	Yes	90	0	0.02
Vanadium, dissolved	mg/L	B-1	-0.00008391	-189	-179	Yes	37	5.405	0.02
		B-2	-0.0001865	-302	-179	Yes	37	8.108	0.02
		B-3	-0.0001999	-250	-179	Yes	37	18.92	0.02
		B-4	-0.0005846	-261	-179	Yes	37	24.32	0.02
		B-5	-0.0005405	-310	-171	Yes	36	22.22	0.02
		B-10	-0.000176	-265	-171	Yes	36	19.44	0.02
		B-12	-0.00001665	-94	-158	No	34	26.47	0.02
Vinyl chloride	ug/L	B-1	0	-4.358	-2.33	Yes	93	98.92	0.02
		B-2	-0.0005125	-6.3	-2.33	Yes	91	68.13	0.02
		B-3	-0.002956	-2.991	-2.33	Yes	93	20.43	0.02
		B-4	-0.001664	-3.937	-2.33	Yes	93	13.98	0.02
		B-5	-0.007516	-4.502	-2.33	Yes	91	5.495	0.02
		B-10	0	-4.812	-2.33	Yes	91	97.8	0.02
		B-12	0	-2.767	-2.33	Yes	90	85.56	0.02
Zinc, dissolved	mg/L	B-1	-0.0001667	-6.511	-2.33	Yes	93	56.99	0.02
		B-2	-0.0002	-5.971	-2.33	Yes	93	53.76	0.02
		B-3	-0.0002318	-6.261	-2.33	Yes	94	55.32	0.02
		B-4	-0.0001762	-6.194	-2.33	Yes	93	54.84	0.02
		B-5	-0.0002186	-6.613	-2.33	Yes	92	55.43	0.02
		B-10	-0.0001708	-5.695	-2.33	Yes	92	57.61	0.02
		B-12	-0.0001715	-5.056	-2.33	Yes	90	61.11	0.02

APPENDIX E-5:
Short-Term Mann-Kendall Trend Tests 2014-2018 – Upper Regional Aquifer

Short-Term Mann-Kendall Trend Tests 2014-2018
Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
1,1-dichloroethane	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	0	68	No	19	100	0.02
		B-4	0	-30	-68	No	19	84.21	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
1,2-dichloroethane	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	0	68	No	19	100	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Acetone	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	-16	-68	No	19	100	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	-14	-58	No	17	100	0.02
Alkalinity	mg/L	**B-1**	**33.92**	**409**	**179**	**Yes**	**37**	**0**	**0.02**
		B-2	-0.5267	-71	-171	No	36	0	0.02
		B-3	-0.1786	-6	-171	No	36	0	0.02
		B-4	**-27.66**	**-517**	**-171**	**Yes**	**36**	**0**	**0.02**
		B-5	-1.596	-69	-166	No	35	0	0.02
		B-10	1.164	50	171	No	36	0	0.02
		B-12	**7.415**	**421**	**151**	**Yes**	**33**	**0**	**0.02**
Ammonia as nitrogen	mg/L	**B-1**	**0.006221**	**7.491**	**2.33**	**Yes**	**93**	**0**	**0.02**
		B-2	-0.0009409	-1.449	-2.33	No	93	32.26	0.02
		B-3	-0.001295	-0.3464	-2.33	No	94	1.064	0.02
		B-4	**0.06054**	**8.041**	**2.33**	**Yes**	**93**	**0**	**0.02**
		B-5	0.008821	1.579	2.33	No	92	1.087	0.02
		B-10	**0.003591**	**3.175**	**2.33**	**Yes**	**92**	**0**	**0.02**
		B-12	0.001174	2.151	2.33	No	90	4.444	0.02
Antimony, dissolved	mg/L	**B-1**	**-5.1E-12**	**-217**	**-171**	**Yes**	**36**	**72.22**	**0.02**
		B-2	**-0.0000239**	**-240**	**-171**	**Yes**	**36**	**77.78**	**0.02**
		B-3	0	-74	-171	No	36	94.44	0.02
		B-4	0	-164	-179	No	37	89.19	0.02
		B-5	**0**	**-187**	**-166**	**Yes**	**35**	**80**	**0.02**
		B-10	0	-23	-166	No	35	97.14	0.02
		B-12	**-0.00004536**	**-232**	**-158**	**Yes**	**34**	**76.47**	**0.02**
Arsenic, dissolved	mg/L	B-1	0	-0.1942	-2.33	No	93	0	0.02
		B-2	**-0.00003065**	**-8.241**	**-2.33**	**Yes**	**92**	**18.48**	**0.02**
		B-3	**-0.00008639**	**-3.635**	**-2.33**	**Yes**	**93**	**18.28**	**0.02**
		B-4	**-0.0001199**	**-4.647**	**-2.33**	**Yes**	**93**	**18.28**	**0.02**
		B-5	**-0.0002278**	**-3.816**	**-2.33**	**Yes**	**91**	**16.48**	**0.02**
		B-10	**-0.00006897**	**-5.927**	**-2.33**	**Yes**	**92**	**18.48**	**0.02**
		B-12	**-0.0002357**	**-7.657**	**-2.33**	**Yes**	**89**	**15.73**	**0.02**
Barium, dissolved	mg/L	**B-1**	**0.002808**	**468**	**179**	**Yes**	**37**	**0**	**0.02**
		B-2	**-0.0007464**	**-195**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-3	0.00009984	6	179	No	37	0	0.02
		B-4	**-0.00468**	**-272**	**-179**	**Yes**	**37**	**0**	**0.02**
		B-5	0.0005706	46	171	No	36	0	0.02
		B-10	0.0009951	125	171	No	36	0	0.02
		B-12	**0.00132**	**489**	**158**	**Yes**	**34**	**0**	**0.02**
Bicarbonate	mg/L	**B-1**	**33.82**	**411**	**179**	**Yes**	**37**	**0**	**0.02**
		B-2	-0.4202	-49	-171	No	36	0	0.02
		B-3	0.2519	10	171	No	36	0	0.02
		B-4	**-27.05**	**-513**	**-171**	**Yes**	**36**	**0**	**0.02**
		B-5	0.6474	22	166	No	35	0	0.02
		B-10	1.164	54	171	No	36	0	0.02
		B-12	**7.606**	**419**	**151**	**Yes**	**33**	**0**	**0.02**
Cadmium, dissolved	mg/L	B-1	0	16	68	No	19	84.21	0.02
		B-2	0	-10	-63	No	18	50	0.02
		B-3	0	55	63	No	18	94.44	0.02
		B-4	0	39	68	No	19	89.47	0.02
		B-5	0	-3	-58	No	17	58.82	0.02
		B-10	0	62	63	No	18	88.89	0.02
		B-12	0	28	58	No	17	82.35	0.02

Short-Term Mann-Kendall Trend Tests 2014-2018
Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
Calcium, total	mg/L	B-1	-0.2362	-3	-68	No	19	0	0.02
		B-2	1.536	68	68	No	19	0	0.02
		B-3	0.2959	5	68	No	19	0	0.02
		B-4	**-6.367**	**-107**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	0.149	5	63	No	18	0	0.02
		B-10	**-3.155**	**-107**	**-63**	**Yes**	**18**	**0**	**0.02**
		B-12	1.086	57	58	No	17	0	0.02
Chemical Oxygen Demand	mg/L	B-1	0	23	68	No	19	42.11	0.02
		B-2	0	33	68	No	19	78.95	0.02
		B-3	0	-9	-68	No	19	42.11	0.02
		B-4	-2.13	-52	-68	No	19	21.05	0.02
		B-5	0.4007	17	63	No	18	0	0.02
		B-10	**0.8827**	**64**	**63**	**Yes**	**18**	**61.11**	**0.02**
		B-12	0	30	58	No	17	76.47	0.02
Chloride	mg/L	B-1	3.922	29	68	No	19	0	0.02
		B-2	-0.2951	-22	-68	No	19	0	0.02
		B-3	-0.08979	-4	-68	No	19	0	0.02
		B-4	**-14.73**	**-154**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	3.264	41	63	No	18	0	0.02
		B-10	0	-8	-63	No	18	0	0.02
		B-12	**0.08378**	**75**	**58**	**Yes**	**17**	**0**	**0.02**
Chlorodifluoromethane (Freon 22)	ug/L	B-1	0	2	68	No	19	10.53	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	-12	-68	No	19	47.37	0.02
		B-4	**-1.291**	**-103**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	-0.07235	-25	-63	No	18	0	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Chloroethane	ug/L	B-1	0	-18	-68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	0	68	No	19	100	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Chromium, dissolved	mg/L	B-1	0	-4	-68	No	19	5.263	0.02
		B-2	0	-51	-68	No	19	0	0.02
		B-3	-0.00005668	-44	-68	No	19	15.79	0.02
		B-4	**-0.0005336**	**-82**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	-0.0004006	-40	-63	No	18	0	0.02
		B-10	-0.00008016	-50	-63	No	18	11.11	0.02
		B-12	5.7E-12	15	58	No	17	41.18	0.02
cis-1,2-dichloroethene	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	16	68	No	19	100	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Cobalt, dissolved	mg/L	B-1	0.00002678	47	68	No	19	10.53	0.02
		B-2	-4.038E-06	-30	-63	No	18	38.89	0.02
		B-3	-0.00003143	-35	-63	No	18	5.556	0.02
		B-4	**-0.00006803**	**-88**	**-68**	**Yes**	**19**	**10.53**	**0.02**
		B-5	-0.00002976	-25	-58	No	17	0	0.02
		B-10	-6.129E-06	-35	-63	No	18	50	0.02
		B-12	0	-12	-58	No	17	52.94	0.02
Copper, dissolved	mg/L	B-1	0	-2	-68	No	19	10.53	0.02
		B-2	0	0	68	No	19	5.263	0.02
		B-3	-0.00001796	-33	-68	No	19	36.84	0.02
		B-4	**-0.00009759**	**-78**	**-68**	**Yes**	**19**	**10.53**	**0.02**
		B-5	-0.00007987	-54	-63	No	18	11.11	0.02
		B-10	0	18	63	No	18	50	0.02
		B-12	-0.00002884	-18	-58	No	17	23.53	0.02
Dichlorodifluoromethane (CFC-12)	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	**-0.2497**	**-104**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-3	0	0	68	No	19	100	0.02
		B-4	0	-24	-68	No	19	84.21	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02

Short-Term Mann-Kendall Trend Tests 2014-2018
Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
Dichloromonofluoromethane (Freon 21)	ug/L	B-1	0	0.3666	2.33	No	65	100	0.02
		B-2	**0**	**-5.106**	**-2.33**	**Yes**	**65**	**73.85**	**0.02**
		B-3	0	-0.2103	-2.33	No	66	34.85	0.02
		B-4	**0**	**-3.908**	**-2.33**	**Yes**	**65**	**52.31**	**0.02**
		B-5	**-0.0223**	**-5.021**	**-2.33**	**Yes**	**64**	**9.375**	**0.02**
		B-10	0	-0.1288	-2.33	No	64	98.44	0.02
		B-12	0	1.852	2.33	No	62	98.39	0.02
Diethyl ether	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	-0.1006	-23	-68	No	19	31.58	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	-0.1885	-42	-63	No	18	11.11	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Iron, dissolved	mg/L	B-1	0.1438	30	68	No	19	0	0.02
		B-2	0	18	68	No	19	78.95	0.02
		B-3	0.09526	9	68	No	19	0	0.02
		B-4	-0.1023	-41	-68	No	19	0	0.02
		B-5	-0.1899	-9	-63	No	18	0	0.02
		B-10	-0.12	-57	-63	No	18	0	0.02
		B-12	0.02843	58	58	No	17	0	0.02
Lead, dissolved	mg/L	B-1	0	-55	-68	No	19	68.42	0.02
		B-2	0	15	63	No	18	94.44	0.02
		B-3	0	25	63	No	18	88.89	0.02
		B-4	0	14	68	No	19	84.21	0.02
		B-5	0	22	58	No	17	76.47	0.02
		B-10	0	35	63	No	18	94.44	0.02
		B-12	0	10	58	No	17	82.35	0.02
Magnesium, dissolved	mg/L	B-1	0.3946	13	68	No	19	0	0.02
		B-2	0.4195	61	68	No	19	0	0.02
		B-3	-0.03321	-1	-68	No	19	0	0.02
		B-4	**-5.349**	**-101**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	0.1264	3	63	No	18	0	0.02
		B-10	**-2.206**	**-106**	**-63**	**Yes**	**18**	**0**	**0.02**
		B-12	**1.278**	**71**	**58**	**Yes**	**17**	**0**	**0.02**
Manganese	mg/L	**B-1**	**0.168**	**71**	**68**	**Yes**	**19**	**0**	**0.02**
		B-2	-0.000113	-42	-68	No	19	15.79	0.02
		B-3	-0.0178	-18	-68	No	19	0	0.02
		B-4	**-0.0676**	**-110**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	-0.006007	-5	-63	No	18	0	0.02
		B-10	**-0.05716**	**-81**	**-63**	**Yes**	**18**	**0**	**0.02**
		B-12	0.0002303	7	58	No	17	0	0.02
Mercury, dissolved	mg/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	63	No	18	100	0.02
		B-3	0	0	63	No	18	100	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	58	No	17	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Nickel, dissolved	mg/L	B-1	0.0002261	33	68	No	19	5.263	0.02
		B-2	0	-15	-63	No	18	5.556	0.02
		B-3	0	-11	-63	No	18	5.556	0.02
		B-4	-0.0002881	-46	-68	No	19	5.263	0.02
		B-5	-0.0005455	-52	-58	No	17	0	0.02
		B-10	-6.67E-05	-42	-63	No	18	27.78	0.02
		B-12	-1.60E-11	-9	-58	No	17	23.53	0.02
Nitrate as nitrogen	mg/L	B-1	0	40	68	No	19	78.95	0.02
		B-2	**0.3365**	**99**	**68**	**Yes**	**19**	**0**	**0.02**
		B-3	0	12	68	No	19	78.95	0.02
		B-4	0	16	68	No	19	63.16	0.02
		B-5	0.08785	53	63	No	18	44.44	0.02
		B-10	0	37	63	No	18	77.78	0.02
		B-12	0	22	58	No	17	76.47	0.02
Nitrite as nitrogen	mg/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	-18	-68	No	19	100	0.02
		B-3	0	-18	-68	No	19	94.74	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	-9	-63	No	18	94.44	0.02
		B-12	0	-16	-58	No	17	100	0.02

Short-Term Mann-Kendall Trend Tests 2014-2018
Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
pH	mg/L	B-1	-0.08295	-25	-68	No	19	0	0.02
		B-2	**-0.2846**	**-92**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-3	-0.1154	-35	-68	No	19	0	0.02
		B-4	-0.1276	-61	-68	No	19	0	0.02
		B-5	-0.2037	-57	-63	No	18	0	0.02
		B-10	-0.009918	-4	-63	No	18	0	0.02
		B-12	-0.1609	-38	-58	No	17	0	0.02
Potassium, dissolved	mg/L	B-1	0.05014	10	68	No	19	0	0.02
		B-2	0.2278	17	68	No	19	0	0.02
		B-3	0.1572	28	68	No	19	0	0.02
		B-4	-0.07806	-18	-68	No	19	0	0.02
		B-5	**0.3288**	**72**	**63**	**Yes**	**18**	**0**	**0.02**
		B-10	-0.04541	-28	-63	No	18	0	0.02
		B-12	0.1969	57	58	No	17	0	0.02
Selenium, dissolved	mg/L	B-1	0.00004632	39	68	No	19	10.53	0.02
		B-2	-0.0003017	-50	-68	No	19	0	0.02
		B-3	-0.00003318	-21	-68	No	19	31.58	0.02
		B-4	0	-25	-68	No	19	0	0.02
		B-5	1.34E-04	36	63	No	18	16.67	0.02
		B-10	0.0001123	36	63	No	18	66.67	0.02
		B-12	0	9	58	No	17	76.47	0.02
Sodium, total	mg/L	B-1	0.723	67	68	No	19	0	0.02
		B-2	-0.2756	-38	-68	No	19	0	0.02
		B-3	0.3486	22	68	No	19	0	0.02
		B-4	**-0.9205**	**-82**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	**3.058**	**72**	**63**	**Yes**	**18**	**5.556**	**0.02**
		B-10	-0.2371	-60	-63	No	18	0	0.02
		B-12	0.4045	55	58	No	17	0	0.02
Specific Conductance	mg/L	B-1	-39.05	-41	-68	No	19	0	0.02
		B-2	2.552	15	68	No	19	0	0.02
		B-3	-11.3	-20	-68	No	19	0	0.02
		B-4	**-84.92**	**-136**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	16.26	31	63	No	18	0	0.02
		B-10	**-32.54**	**-103**	**-63**	**Yes**	**18**	**0**	**0.02**
		B-12	**15.52**	**95**	**58**	**Yes**	**17**	**0**	**0.02**
Sulfate	mg/L	**B-1**	**-0.8578**	**-106**	**-68**	**Yes**	**19**	**5.263**	**0.02**
		B-2	0	-3	-68	No	19	0	0.02
		B-3	0	43	68	No	19	94.74	0.02
		B-4	**-4.391**	**-125**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	0.01003	9	63	No	18	22.22	0.02
		B-10	**-4.008**	**-103**	**-63**	**Yes**	**18**	**0**	**0.02**
		B-12	-0.1755	-24	-58	No	17	0	0.02
Tetrachloroethene	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	16	68	No	19	100	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Tetrahydrofuran	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	-3	-68	No	19	94.74	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	-0.4973	-59	-63	No	18	5.556	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	-14	-58	No	17	100	0.02
Toluene	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	16	68	No	19	100	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Total Dissolved Solids	mg/L	B-1	6.05	9	68	No	19	0	0.02
		B-2	2.552	45	68	No	19	0	0.02
		B-3	-3	-10	-68	No	19	0	0.02
		B-4	**-41.35**	**-139**	**-68**	**Yes**	**19**	**0**	**0.02**
		B-5	3.355	15	63	No	18	0	0.02
		B-10	**-19.02**	**-86**	**-63**	**Yes**	**18**	**0**	**0.02**
		B-12	**8.083**	**113**	**58**	**Yes**	**17**	**0**	**0.02**

Short-Term Mann-Kendall Trend Tests 2014-2018
Regional Aquifer

Analyte	Units	Well	Slope	Z-Score	Critical Value	Significant Trend?	# of Samples	% Non-detects	Alpha
Total Organic Carbon	mg/L	B-1	0.2537	38	68	No	19	0	0.02
		B-2	0.02401	54	68	No	19	0	0.02
		B-3	-0.08555	-17	-68	No	19	0	0.02
		B-4	0.008031	4	68	No	19	0	0.02
		B-5	0.2522	31	63	No	18	0	0.02
		B-10	-0.04026	-56	-63	No	18	0	0.02
		B-12	0.0311	30	58	No	17	0	0.02
Trichloroethene	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	0	68	No	19	100	0.02
		B-3	0	0	68	No	19	100	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Trichlorofluoromethane (CFC-11)	ug/L	B-1	0	0	68	No	19	100	0.02
		B-2	0	-26	-68	No	19	73.68	0.02
		B-3	0	16	68	No	19	100	0.02
		B-4	0	0	68	No	19	100	0.02
		B-5	0	0	63	No	18	100	0.02
		B-10	0	5	63	No	18	94.44	0.02
		B-12	0	0	58	No	17	100	0.02
Vanadium, dissolved	mg/L	B-1	0	-18	-68	No	19	0	0.02
		B-2	0	-30	-68	No	19	5.263	0.02
		B-3	0	1	68	No	19	15.79	0.02
		B-4	0.00008089	34	68	No	19	15.79	0.02
		B-5	-0.0001172	-28	-63	No	18	11.11	0.02
		B-10	-0.0000395	-14	-63	No	18	5.556	0.02
		B-12	0.00003148	20	58	No	17	5.882	0.02
Vinyl chloride	ug/L	**B-1**	**0**	**74**	**68**	**Yes**	**19**	**100**	**0.02**
		B-2	**0**	**70**	**68**	**Yes**	**19**	**100**	**0.02**
		B-3	0.0004398	16	68	No	19	36.84	0.02
		B-4	0.002714	22	68	No	19	21.05	0.02
		B-5	0.005577	10	63	No	18	0	0.02
		B-10	0	57	63	No	18	94.44	0.02
		B-12	0	39	58	No	17	82.35	0.02
Zinc, dissolved	mg/L	B-1	0	1	68	No	19	21.05	0.02
		B-2	0	14	68	No	19	21.05	0.02
		B-3	0	15	68	No	19	31.58	0.02
		B-4	0	-12	-68	No	19	15.79	0.02
		B-5	0	-7	-63	No	18	11.11	0.02
		B-10	0	6	63	No	18	27.78	0.02
		B-12	0	6	58	No	17	41.18	0.02

APPENDIX F:
Landfill Gas Monitoring Data – 2018

Table G-1. Perimeter Landfill Gas Measurements, 2018
Inman Landfill

Well Identifier	Probe Identifier	Screened Interval Depth (ft bgs)	Date	CH4 Concentration (%v/v)	CO2 Concentration (%v/v)	O2 Concentration (%v/v)	Barometric Pressure mm Hg	Static Pressure (inches H2O)	LFG Extraction System Status
GDW-1	Shallow	19-21	3/12/18	2.3	3.2	11.3	29.87	1.36	off
			7/3/18	0.0	1.0	17.7	29.9	0.2	off
			10/2/18	**23.70**	15.50	1.00	29.65	0.45	off
			12/5/18	**27.60**	15.50	1.00	29.65	0.45	off
GDW-1	Intermediate	58-60	NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
GDW-1	Deep	82-84	3/12/18	0	0.2	20.2	30.12	1.07	off
			7/3/18	0.0	0.3	18.7	29.9	0.3	off
			10/2/18	0.00	13.90	0.40	29.66	0.47	off
			12/5/18	0.1	1.1	18.6	30.2	1.5	off
GDW-2	Shallow	14.5-15.5	3/21/18	0	0.8	20.1	30.05	0.91	off
			7/3/18	0.1	0.0	18.6	30.1	0.4	off
			10/2/18	0.00	3.70	18.00	29.68	0.16	off
			12/4/18	0.00	3.70	18.00	29.68	0.16	off
GDW-2	Intermediate	27-28	3/21/18	0	6.2	12.8	30.05	1	off
			7/3/18	0.1	0.0	18.6	30.1	0.5	off
			10/2/18	0.00	5.20	14.20	29.68	0.21	off
			NM	NM	NM	NM	NM	NM	off
GDW-2	Deep	44-45	3/21/18	0	3.8	15	30.01	1	off
			7/3/18	0.1	0.0	18.7	30.1	0.6	off
			10/2/18	0.00	7.50	11.50	29.68	0.22	off
			12/4/18	0.00	7.50	11.50	29.68	0.22	off
GDW-5	Shallow	9-10	NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
GDW-5	Intermediate	19-20	NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
GDW-5	Deep	29-30	NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off
			NM	NM	NM	NM	NM	NM	off

Table G-1. Perimeter Landfill Gas Measurements, 2018
Inman Landfill

Well Identifier	Probe Identifier	Screened Interval Depth (ft bgs)	Date	CH4 Concentration (%v/v)	CO2 Concentration (%v/v)	O2 Concentration (%v/v)	Barometric Pressure mm Hg	Static Pressure (inches H2O)	LFG Extraction System Status
GP-6	Shallow	7-27	3/12/18	0	0.2	20.2	30.46	1.17	off
			7/3/18	0.1	0.0	18.8	30.3	0.1	off
			10/1/18	0.00	0.60	20.60	29.71	0.10	off
			12/5/18	0.1	2.5	14.9	30.2	0.9	off
GP-6	Deep	34-74	3/12/18	0	3.2	16.5	30.06	1.01	off
			7/3/18	0.1	0.0	18.7	30.3	0.1	off
			10/1/18	0.00	1.00	20.20	29.71	0.12	off
			NM	NM	NM	NM	NM	NM	off
GP-7	Shallow	7-17	3/12/18	0	10.4	9.8	30.06	0.9	off
			7/3/18	0.1	0.0	18.7	30.2	0.1	off
			10/1/18	0.00	0.00	21.00	29.75	0.07	off
			12/5/18	0.0	11.1	6.1	30.2	0.9	off
GP-7	Deep	26-49	3/12/18	0	4.9	17.9	30.06	1.18	off
			7/3/18	0.1	0.0	18.8	30.2	0.1	off
			10/1/18	0.00	0.00	20.90	29.76	0.08	off
			12/5/18	0.0	2.7	18.0	30.2	1.2	off
B-6	Shallow	39-40	3/13/18	0	0.6	19.7	29.82	1.02	off
			7/3/18	0.1	1.0	17.7	30.2	0.0	off
			10/1/18	0.00	0.00	21.00	29.75	0.07	off
			NM	NM	NM	NM	NM	NM	off
B-6	Intermediate	94-95	3/13/18	0	0.1	20.4	29.82	1	off
			7/3/18	0.1	0.1	19.0	30.2	0.1	off
			10/10/18	0.0	0.0	20.1	30.3	-0.2	off
			12/10/18	0.0	0.0	20.1	30.3	-0.2	off
B-6	Deep	134-135	3/13/18	0	1.2	18.9	29.82	1.05	off
			7/3/18	0.1	0.0	19.2	30.2	0.1	off
			10/1/18	0.00	0.00	20.90	29.76	0.08	off
			12/10/18	0.00	0.00	20.90	30.20	0.08	off
B-7	Shallow	14-15	3/21/18	0	0.2	20.3	30.48	1.22	off
			7/3/18	0.1	0.0	18.8	30.2	0.1	off
			10/2/18	0.00	12.20	7.30	29.69	0.10	off
			12/4/18	0.0	0.1	20.0	30.2	0.9	off
B-7	Deep	50-51	3/21/18	0	0.2	20.2	30.47	1.22	off
			7/3/18	0.1	0.0	18.9	30.2	0.1	off
			10/2/18	0.00	6.40	11.40	29.70	0.16	off
			12/4/18	0.0	0.0	19.9	30.2	0.8	off

Table G-1. Perimeter Landfill Gas Measurements, 2018
Inman Landfill

Well Identifier	Probe Identifier	Screened Interval Depth (ft bgs)	Date	CH4 Concentration (%v/v)	CO2 Concentration (%v/v)	O2 Concentration (%v/v)	Barometric Pressure mm Hg	Static Pressure (inches H2O)	LFG Extraction System Status
B-9	Shallow	10-11	3/13/18	NM	NM	NM	NM	NM	off
			7/3/18	0.1	0.0	18.8	30.2	0.1	off
			10/1/18	0.00	2.90	18.40	29.75	0.08	off
			12/12/18	0.00	2.90	18.40	29.75	0.08	off
B-9	Deep	49-50	3/13/18	0.1	0.0	18.9	30.2	0.1	off
			7/3/18	0.1	0.0	18.9	30.2	0.1	off
			10/1/18	0.00	2.90	18.40	29.75	0.08	off
			12/12/18	0.00	2.90	18.40	30.20	0.08	off
B-11	Shallow	66-67	3/13/18	0	0.4	19.5	29.87	0.55	off
			NM	NM	NM	NM	NM	NM	off
			10/1/18	0.00	0.30	19.90	29.70	0.25	off
			12/13/18	0.00	0.30	19.90	30.20	0.25	off
B-11	Deep	86-87	3/13/18	0	0.3	19.6	29.86	1.26	off
			NM	NM	NM	NM	NM	NM	off
			10/1/18	0.00	0.10	20.60	29.71	0.10	off
			12/13/18	0.00	0.10	20.60	30.20	0.10	off
B-13	Shallow	38-40	3/12/18	0	0.1	20.2	30.14	1.03	off
			7/3/18	0.1	0.1	18.7	30.2	0.3	off
			10/2/18	0.00	6.90	10.30	29.65	0.47	off
			12/5/18	0.0	0.1	20.0	30.2	1.3	off
B-13	Deep	73-74	3/12/18	0	1.7	17.8	30.14	1.14	off
			7/3/18	0.1	0.9	17.5	30.2	0.3	off
			10/2/18	1.80	9.00	0.30	29.66	0.47	off
			12/5/18	0.0	0.1	20.0	30.2	1.6	off

Notes:
ft bgs = feet below ground surface
%v/v = percent by volume
NA = Flow restriction error.
NM = Not measured
Methane results above lower explosive limit shown in **bold.**