

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
PETITION OF CITY OF COLLINSVILLE) AS 2015-003
FOR AN ADJUSTED STANDARD FROM) (Adjusted Standard-Water)
PORTIONS OF 35 ILL. ADM. CODE)
620.410 FOR CERTAIN CONSTITUENTS.)

Notice of Filing

TO:

Mr. John Therriault
Illinois Pollution Control Board
James R. Thomson Center
100 W. Randolph Street
Suite 11-500
Chicago, Illinois 60601-3218

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grant Avenue East
P.O. Box 19276
Springfield, IL 62974-9276

PLEASE TAKE NOTICE That on this 10th day of August, 2015, I have filed with the Office of the Clerk of the Illinois Pollution Control Board the Written Responses to the BOARD QUESTIONS FOR CITY OF COLLINSVILLE, all of which were filed electronically August 10, 2015, which are together attached and herewith served upon you.

Respectfully Submitted,

City of Collinsville

By: 
Frank H. Hackmann
One of its Attorneys

Dated: August 10, 2015

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CERTIFICATE OF SERVICE

I, Frank H. Hackmann, the undersigned, an attorney, certify that I have served the Written Responses to the BOARD QUESTIONS FOR CITY OF COLLINSVILLE questions upon:

Mr. John Therriault
Illinois Pollution Control Board
James R. Thomson Center
100 W. Randolph Street
Suite 11-500
Chicago, Illinois 60601-3218

Via Electronic Filing on August 10, 2015, and upon:

James M. Kropid
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Illinois Environmental Protection Agency
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Via Electronic Filing on August 10, 2015.



Frank H. Hackmann

Written Responses to the BOARD QUESTIONS FOR CITY OF COLLINSVILLE

35 Ill. Adm. Code 104.406(a)

1. The petition states, "Collinsville seeks this relief in order to obtain its certification of completion of post-closure care..." Pet. at 1-2. The petition further states, "The closed landfill...was in operation under the 807 regulations from the early 1970s through 1984..." Pet. at 6. Please clarify if Collinsville will be seeking a certification of completion of post-closure care pursuant to 35 Ill. Adm. Code 807.524(c).

***Response:** Yes, the City will seek a certification of completion of post-closure care under 807.524.*

2. The petition states, "Collinsville seeks relief from 35 Ill. Adm. Code 620.410(a), (b), (c), (e) and 620.440(c) as more fully set forth in Exhibit [8]." Pet. at 5.

- (a) Section 620.410(c) lists the Class I groundwater quality standards for Explosive Constituents. Neither Exh. 8 nor paragraph 17 of the petition list any constituents from 35 Ill. Adm. Code 620.410(c).

- (i) Please clarify for which constituent under 35 Ill. Adm. Code 620.410(c) Collinsville seeks an adjusted standard.

***Response:** 35 Ill. Adm Code (IAC) 620.410(c) does not apply to the Petition for Adjusted Standards for the Closed Collinsville Landfill.*

- (ii) Please provide justification for any such constituents along with any alternate limits.

***Response:** 35 IAC 620.410(c) does not apply to the Petition for Adjusted Standards for the Closed Collinsville Landfill and will be omitted.*

- (b) Subsection 620.440(c), which sets forth standards for groundwater within a previously mined area that is classified as Class IV: Other Groundwater under Section 620.240(g), specifies for some constituents that the Class II standard applies and for others that "the standards are the existing concentrations." 35 Ill. Adm. Code 620.440(c). Collinsville states the landfill is subject to Class I groundwater quality standards. Pet. at 9. Paragraph 17 and Exh. 8 do not seem to specifically address an adjusted standard from subsection 620.440(c).

- (i) Please clarify why the Collinsville landfill property is subject to Class I groundwater quality standards rather than Class IV for groundwater within a previously mined area.

Response: *35 IAC 620.440(c) is applicable to groundwater in previously mined areas but is not necessarily applicable to groundwater downgradient of a landfill. The reference to 620.440(c) and 620.420 in the Petition was used for comparison purposes.*

At the time 35 IAC Part 807 went into effect, we believe no one considered the presence of coal and gob piles significant. Additionally, we do not believe the IEPA was aware of the prior coal mining activities on the Site until the City's 2006-2008 Groundwater Assessment investigation determined that mining activity had occurred on the Site. Coal and acidic coal waste were stored on and later incorporated into the landfill. In general, the area from Edwardsville to Belleville has had significant mining activities prior to 1960.

- (ii) Please address whether Collinsville intends to proceed under 35 Ill. Adm. Code 620.260 Reclassification of Groundwater by Adjusted Standard.

Response: *Yes, the City intends to proceed under 35 IAC 620.260. The constituents that exceed Class I standards or background values are associated with pre-landfill coal mining activities and post-landfill application of herbicides (p-dioxane).*

- (iii) Please clarify what adjusted standard Collinsville is seeking from subsection 620.440(c).

Response: *The City referenced subsection 620.440(c) for comparison and rationale for the coal-related adjusted standards selected and is not seeking an adjusted standard from subsection 440.*

- (iv) If Collinsville is seeking an adjusted standard from subsection 620.440(c), please clarify if Collinsville is seeking to classify some or all of the groundwater at the site as Class IV: Other Groundwater. If so, please provide supporting information to demonstrate the groundwater in specific areas of the site meets the Class IV provisions of Section 620.240 rather than the Class I criteria under Section 620.210.

Response: *The City is not seeking an adjusted standard from subsection 620.440. The City referenced subsection 620.440 for comparison and rationale for the coal-related proposed adjusted standards.*

- (v) Please clarify if Collinsville is seeking adjusted standards for the following constituents as provided in 620.440(c) to be set at the Class II water quality standards or the existing concentrations:

Response: *Since subsection 620.440(c) is appropriate for coal-related constituents and allows the use of existing concentrations, the City proposes to use subsection 620.440(c) as rationale for the selection of existing concentrations as the adjusted standard for coal-related parameters present above Class I and background values.*

These parameters include TDS, arsenic, chloride, iron, manganese, arsenic, perchlorate, and pH. Ammonia, boron, sulfate, total organic carbon (TOC), total organic halides (TOX), and zinc are also present as a result of the presence of gob within the landfill. However, these parameters exceed background values only and not Class I standards. The City would like to omit the comparison of the coal-related compounds to background values. We would be happy to further discuss if needed.

Class II Water Quality Standards:

All constituents listed under Section 620.420 except the following.

Existing Concentrations

TDS

Chloride

Iron

Manganese

Sulfates

pH

1,3-dinitrobenzene

2,3-dinitrotoluene

2,6-dinitrotoluene

HMX (high melting explosive, octogen)

Nitrobenzene

RDS (royal demolition explosive, cyclonite)

1,3,5-trinitrobenzene

2,4,6-trinitrotoluene (TNT)

Response: *Since existing concentrations are appropriate for the coal-related constituents (according to subsection 620.440(c)), existing concentrations are the proposed standard for TDS, arsenic, chloride, iron, manganese, perchlorate, and pH. The existing concentration will also apply to perchlorate because the source of the perchlorate is pre-landfill blasting during coal mining. The analysis of the above listed explosive*

compounds was not required and they are not included in the Petition for Adjusted Standards.

3. The petition states that Subsection “620.420(a)(2) addresses pesticide chemicals”. Pet. at 6.

(a) Please clarify if Collinsville intended this reference to be Subsection 620.420(b)(2) which addresses standards for pesticide chemical constituents.

Response: *Yes, the intended reference was to 620.420(b)(2).*

(b) Subsection 620.420(b)(2) provides that the Class II standards for pesticide chemical constituents “do not apply to groundwater within 10 feet of the land surface...” 35 Ill. Adm. Code 620.420(b)(2). Please clarify if Collinsville is requesting an adjusted standard for Picloram, p-dioxane, and MCPP such that neither the Class I, Class II, nor requested numeric adjusted standards would apply to “groundwater within 10 feet of the land surface, provided that the concentrations of such constituents result from the application of pesticides in a manner consistent with the requirements of the Federal Insecticide, Fungicide and Rodenticide Act) 7 USC 136 et seq.) and the Illinois Pesticide Act [415 ILCS 60].” See Ill. Adm. Code 620.420(b)(2).

Response: *Though groundwater downgradient from the landfill is typically less than 10 feet bgl, the depth to groundwater in the background well is typically 30 feet bgl. During times of drought, depth to groundwater is often greater than 10 feet bgl.*

Proposed standards have been revised. Picloram and MCPP were removed from the list of parameters included in the proposed standards due to the limited number of detections (MCPP detected once and Picloram detected twice). The proposed adjusted standard for p-dioxane is the highest concentration detected – 51 ug/L

4. The petition states, “Collinsville seeks relief from 35 Ill. Adm. Code ... 620.440(c) as more fully set forth in Exhibit [8].” Pet. at 5, emphasis added. The petition states, “The City of Collinsville closed landfill is currently subjected to Class I Groundwater standards...” Pet. at 9. The petition also states, “Collinsville hereby requests an adjusted standard, consistent with Exhibit [8], which confirms that certain constituents, as outlined below, be evaluated against the Class II Standards, 620.420, in accordance with 620.440(c) as modified by this Adjusted Standard Petition.” Pet. at 9, emphasis added. Subsection 620.440(c) provides for the Class IV groundwater quality standards within a previously mined area.

- (a) Please clarify if the area of Collinsville landfill property for which the adjusted standard is sought is subject to Class IV: Other Groundwater standards.

Response: - 35 IAC 620.440(c) is applicable to groundwater in previously mined areas but is not applicable to groundwater downgradient of landfills. The references to 620.440(c) and 620.420 were used for comparison purposes. Since subsection 620.440(c) is appropriate for the coal-related parameters at the Site and allows the use of existing concentrations, the City proposes to use subsection 620.440(c) as rationale for the selection of existing concentrations as the adjusted standard for the coal-related parameters. These parameters include TDS, arsenic, chloride, iron, manganese, perchlorate, and pH. Class II groundwater standards will not be included.

Additionally, ammonia, boron, sulfate, TOC, TOX, and zinc are also present as a result of the presence of gob within the landfill. However, these parameters exceed background values only and not Class I standards. The City would like to omit the comparison of the coal-related compounds to background values. We will be happy to further discuss if needed.

- (b) Please clarify if Collinsville is requesting an adjusted standard **from** Section 620.440(c) or if Collinsville simply referenced Section 620.440(c) as a point of comparison for constituents the Board has already recognized for Class IV groundwater within a previously mined area.

Response: The City is not seeking an adjusted standard **from** subsection 620.440(c). The City referenced subsection 620.440 for comparison and rationale for the proposed coal-related adjusted standards.

- (c) For the following constituents listed in Exhibit 8, 35 Ill. Adm. Code 620.440(c) provides that the Class IV groundwater quality standards within a previously mined area are the existing concentrations:

TDS
Chloride
Iron
Manganese
Sulfates
pH

Please clarify if Collinsville is requesting an adjusted standard from the existing concentrations for these constituents such that the adjusted standard would be the concentrations provided in Exh. 8.

Response: Since existing concentrations are appropriate for the coal-related constituents associated with the buried coal waste (35 IAC 620.440(c)), existing

concentrations are the proposed standard for TDS, arsenic, chloride, iron, manganese, perchlorate and pH. The existing concentration is also proposed for perchlorate because the source of the perchlorate is pre-landfill blasting during coal mining. Exhibit 8 has been modified to indicate "existing concentration" and is provided in Attachment 1.

5. Exh. 3 refers to a Violation Notice M-1998-00195, issued by IEPA on October 6, 1998 as a result of an IEPA inspection of the landfill completed on April 22, 1998. Exh. 3 at iv. Exh. 3 states, "IEPA's inspection of the landfill completed on April 22, 1998...identified levels of chloride and Total Dissolved Solids (TDS) in monitoring well MW-1 had exceeded the Class I Groundwater Standards of 200 mg/L and 1,200 mg/L, respectively (35 IAC 620.420(a), except as provided in Section 620.450 or subsection [620.420](a)(3) or (d))." Exh. 3 at iv.

Although the statement from Exh. 3 above refers to the Class I Groundwater Standards, it cites to the Class II Groundwater Standards at 35 Ill. Adm. Code 620.420(a). Please clarify if Exh. 3 meant to cite to the Class I groundwater quality standards at Section 620.410(a) for inorganic chemical constituents. If not, please clarify the applicability of Section 620.420 as stated in Exh. 3.

***Response:** The IEPA initially considered the groundwater at the Site as Class II groundwater when the 1998 Violation Notice was issued. However, in 2002, aquifer tests categorized the groundwater as Class I. The text of the executive summary (page iv of Exhibit 3) and Pages 3 and 4 of the report (Exhibit 3) are in error. Prior to 2002, results were compared to Class II groundwater quality standards, until the site was categorized as Class I groundwater. The referenced pages of Exhibit 3, pages iv and 3 have been revised and are included as Attachment 2. Page 4 was also revised and is included in Attachment 2.*

35 Ill. Adm. Code 104.406(d)

6. The petition explains that a leachate collection system was installed to collect leachate in three subsurface interceptor trenches and that collected leachate is transported and discharged to the Collinsville Waste Water Treatment Plant. The petition states, "[A] fourth interceptor trench was installed to address creek erosion adjacent to the landfill and the presence of seeps on the northern perimeter of the landfill." Pet. at 6. Collinsville states, "[T]he erosion protection will preserve the integrity of the creek bank and prevent the creek from cutting into the landfill. The new leachate collection system was activated in January 2014 and leachate samples will be collected annually for two years and results will be evaluated against previous leachate results to assess the need for additional leachate sampling." Pet. at 7.

- (a) If IEPA issues a certification of completion of post-closure care, please explain what maintenance Collinsville will perform to address any continued seeps on the northern perimeter and the leachate collected in the interceptor trenches.

Response: *The City will continue to pump leachate from the leachate collection system and perform monthly inspections of the landfill and creek. Should seeps appear, the City will repair the seeps as they develop. Should the creek begin to negatively impact the erosion control feature or cut into the bank and jeopardize the landfill, the City will repair the erosion control feature or install additional erosion controls at the Site.*

Additionally, recent research of old reports and records revealed that the initial leachate management system included three leachate recovery building, three leachate collection wells, but one interceptor trench. The sole trench connects to the leachate collection well at Leachate Recovery Building #1. The original interceptor trench is located in the northwest part of the landfill. The length and actual location of the trench was not identified in the document reviewed (Draft Limited Site Investigation and Recommendation for Development of a leachate Management System for the Closed Collinsville Landfill, September 1991, Mathes & Associates). This document is provided as Attachment 3.

- (b) Please explain what mechanism, such as an institutional control, Collinsville will use to ensure maintenance of the erosion protection of the creek bank.

Response: *At the present time, the IEPA and Madison County provide enforcement. Prior to attaining final closure, the City will evaluate their options and, in consultation with the IEPA, will develop an appropriate path, acceptable to IEPA, to ensure future maintenance of the erosion protection features at the Site. The City intends to provide continued maintenance of the entire Site into the future for as long as they own the Site. According to recent discussions with the City, the City is willing to include a deed restriction that will require IEPA's approval prior to any sale of the property.*

7. The petition states, "The mine covered the entire project site [Collinsville Landfill] and was known as Canteen Mine Number 2...The mine shafts...were located northwest of the project site..." Exh. 1 at 1. Please clarify if the Canteen Mine was a subsurface or surface mine.

Response: *All of the coal mines east, northeast, south, and southeast of Collinsville including Canteen Mine Number 2 were subsurface mines with mine shafts.*

8. The petition explains that the principal activity at the landfill is periodic monitoring along with the collection and transportation of leachate to the Collinsville Wastewater Treatment Plant. Pet. at 6. Please address the number of employees at the facility,

indicating whether they are contractors or city employees, and the frequency of their visits to the landfill.

Response: *There are no permanent employees at the landfill. One City employee visits the landfill approximately eight times a month to inspect the landfill or pump and transport leachate to the designated City sanitary sewer manhole.*

Two contractors typically visit the site quarterly for a period of two days (four times a year for two days).

9. To address the area affected, please identify the vertical and horizontal boundaries within which the adjusted groundwater quality standards would apply by identifying the affected water bearing unit and by supplying a legal description along with a map delineating the limits of the landfill property to which the adjusted standard would apply.

Response: *The adjusted standards will apply to groundwater downgradient and adjacent to the landfill, MW-6, and City property on the north side of Canteen Creek. Figures showing the horizontal and vertical boundaries of the waste within the landfill and the extent of the pre- landfill contamination is provided in Attachment 4.*

The City proposes that the adjusted standards be applied to groundwater adjacent and downgradient of the landfill to the southern and eastern property boundaries, to and including MW-6, to the western unnamed Creek, to the northern City property boundary and throughout the area beneath the landfill where coal, coal residuum or gob were stored. The vertical boundaries encompass groundwater elevations that are adjacent or downgradient of the landfilled waste (Approximately and elevation of 530 ft amsl) to the groundwater elevations below and adjacent to the landfilled waste, the City's property on the north side of the creek and potential buried coal, coal residuum and gob, and the lowest elevations of Canteen Creek. (within the City's property boundary (approximately 496 ft ams)).

Based on the hydraulic investigation performed in 1991 (Attachment 3), the 2008 Groundwater Assessment, 15 years of water level measurements and water table maps, and the presence of artesian groundwater south and southwest of the Site, the hydraulic force from the upgradient surface impoundments drives the groundwater northward within the landfill. Please note that on Cross-Section F-F,' (Attachment 4) the 1991 leachate well, 91-LRW-1 was also artesian.

The legal description of the property and figures, tables and boring logs from the 2008 Groundwater Assessment Report are provided as Attachments 5 and 6. Figures 11-15 from the 2008 Groundwater Assessment Report (Attachment 6) show the horizontal extent of the dominant coal-related contaminants (unfiltered iron, chloride, manganese, and low pH). The 2008 assessment did not include the parameter perchlorate.

Generalized cross-section showing the vertical extent of the most widely distributed contaminant, manganese, is provided in Attachment 4. The figures are based on information presented in the 1991 Mathes report, the 2008 Groundwater Assessment and the 2013 and 2014 Annual Report.

10. In Figures B-1 through B-12 Aerial Photographs Sample Locations, the legend for the purplish line reads, "Southern/Eastern Landfill Property Boundary". However, the purplish line is shown traversing only part of the way across the northern and western perimeter of the landfill. (Pet. Exh. 1) Figure 4-1 depicts the property boundary around the full perimeter with a blue line. (Pet. Exh. 4.)

(a) Please clarify if the property boundary depicted in Figure 4-1 accurately reflects the property boundary that should appear in Figures B-1 through B-12.

Response: *The figures were excerpted from the 2008 Groundwater Assessment Report. Based on current knowledge of the waste boundaries and the deviations from photo to photo even using the same scale, those shown in the figures are not accurate. Additionally, recent information obtained from a 2012 test pit investigation for optimal placement of the new French drain provided more detailed information concerning the limit of the waste and the presence of coal/gob in the landfill. The legend and Figures (B1-B12 and 4-1) have been revised and are provided as Attachments 7 (Figures B1-B-12) and 8 (Figure 4-1).*

(b) In Figure 4-1 in the northwest corner of the property, the yellow line depicting the boundary of waste appears to cross outside the blue line depicting the property boundary. Please clarify if the waste boundary extends beyond the property line or provide a revised figure depicting the property boundary and waste boundary.

Response: *The landfilled waste does not extend beyond the property boundary. A revised figure is provided (Attachment 8).*

11. Exh. 1 indicates that for Figure B-12 (Exh. 1), "the actual boundary of the landfilled waste is outlined with a solid red line." The solid red line in Figure B-12 extends west beyond the "southern tributary" surface water, indicating the landfilled waste area incorporates portions of the creek. A solid red line denotation also appears in Figure 2 (Exh. 3-1) in a slightly different location east of the southern tributary. Figure 2 (Exh. 31) also denotes a disjointed yellow line as the "Boundary of Waste". Figure 4-1 (Exh. 3) also depicts the same details but in slightly different locations. The locations of the monitoring wells, piezometers, and soil borings are also shifted from Figure B-12 to Figure 2 to Figure 4-1. Please provide revised Figure B-12 (Exh. 1), Figure 2 (Exh. 3-1), and Figure 4-1 (Exh. 4) showing consistent and precise details.

Response: *The figures have been revised. Wells and piezometers have been located as accurately as possible on the historical aerials that did not have electronic coordinates.*

12. Figure B-12 (Exh. 1) and Figure 2 (Exh. 3-1) depict the following monitoring wells as outside the landfill property boundary: MW-2, MW-6, MW-7. Figure 4-1 (Exh. 4) depicts MW-6 and MW-7 as inside the landfill property boundary and MW-2 and MW-5 as outside. Exh. 5-7 at 17 states that MW-6 is located on residential property adjacent to the site.

- (a) Please clarify the locations of each of the onsite and offsite monitoring wells.

Response: *The figures have been updated (Attachment 4, 7 and 8). Instead of defining the "Landfill Property Boundary" the figures were revised to define the "Collinsville Property Boundary." Off-site wells/piezometers include MW-2, P-6, P-5 and MW-6. MW-6 is the background well.*

- (b) Please provide a figure accurately depicting the monitoring well locations.

Response: *Figures have been revised to depict monitoring well locations as accurately as possible. The aerial photos were obtained as photos only and well locations were placed on pdf copies of the aerial by hand. The most accurate locations are included with the 2015 figure (Attachment 4). Well locations were determined using northings and eastings using a geographic information system.*

13. Figure 2 "Cross Sections A-A', B-B', and C-C' " (Exh. 3, Att. A1) depict depth profiles for the landfill.

- (a) Please provide a plan view site map showing the locations of the cross sections.

Response: *The cross-sections were obtained from the 1991 Mathes report (Attachment 3).*

- (b) Please indicate the lowest elevation of the bottom of the landfill.

Response: *Tetra Tech was not involved with operation or closure of the landfill. A review of the City records and the IEPA records at the Collinsville regional IEPA office did not uncover the lowest elevation of the bottom of the landfill. However, the lowest elevation was estimated based on the 1991 report prepared by Mathes (Attachment 3). The maximum depth of the trash in the landfill is 28 feet bgl and the lowest elevation of the base of the landfill, based on 1991 cross-sections, is 488 feet above mean sea level (amsl). The location of the lowest elevation of trash is near the 1991 leachate wells MW-04 in the southwest quadrant of the landfill. The locations of the 1991 wells, the 2008 monitoring*

locations and current locations are shown in 2015 water table figure in Attachment 4.

14. Table 1 (Exh. 5-7) provides groundwater elevations for MW-1 through MW-7. The lowest groundwater elevation appears to be 481.28 feet in MW-2. Figure 2 (Exh. 3, Att. A1) shows the landfill elevations. The lowest elevation of the bottom of the landfill provided in the record appears to be approximately 485 feet above NGVD [National Geodetic Vertical Datum].

- (i) Please indicate if any of the monitoring wells were screened below the lowest elevation of the bottom the landfill. If not, please explain why.

***Response:** First, during Tetra Tech's monitoring of the landfill (1999 to the present), the IEPA did not request the addition of wells screened below the lowest elevation of the landfill. Second, MW-2 is not downgradient of the landfill, but is side-gradient. MW-2 is downgradient of the surface impoundments south of the landfill. Third, groundwater was encountered in two wells downgradient of the landfill well below the lowest elevation of the landfill and one of those wells was screened well below that elevation. The groundwater elevations are somewhat deceiving in the two wells described below as a result of a strong upward vertical gradient.*

During the 2006-2008 assessment monitoring period, the maximum depths of two wells (MW5 and MW7) were below the lowest elevation of the bottom of the landfill (488 feet amsl). The upper shallow water bearing zone was not encountered in either well. The upper water-bearing zone is typically encountered within the upper 20 feet and at elevations above the elevation of Canteen Creek (500-485'amsl) and the unnamed western creek (500-490'amsl). Cross –sections and boring logs are provided in Attachments 4 and 6, respectively.

MW-7 is located 320 feet south-southwest of the deepest elevation of the landfill (1991-MW-04). MW-7, the artesian well, was drilled to an elevation of 480.5 feet amsl. Shallow water was not present at this location. Water was encountered at 483 feet amsl. This elevation is below the elevation of the adjacent western creek (500 feet amsl). MW-7 was screened from 491 ft amsl to 481 ft amsl. The well was artesian when initially installed and water levels have ranged from 0.5-2.5 feet bgl. This suggests a strong upward vertical gradient. Downward migration of contaminants associated with the leachate or the upper shallow water bearing zone is not likely. No assessment monitoring parameters exceeded Class I Groundwater Quality Standards in MW-7.

MW-5 is located on the northern bank of Canteen Creek at the entrance to the landfill. The purpose of this well was to determine if impacted groundwater was flowing beneath the creek in a northeasterly direction. The upper shallow water-bearing zone was not encountered at MW-5. Water was encountered at an elevation of 472 feet amsl (24 feet bgl and well below the 490 foot elevation of Canteen Creek). A 5-foot screen was installed in this well from 474.27 to 469.27 feet amsl, well below the lowest elevation of the landfill. Water levels range between approximately 6-8 feet bgl suggesting a strong upward gradient. Based on potentiometric maps, the direction of groundwater flow in MW-5 is southward toward Canteen Creek. The impacted groundwater is not migrating northeastward below the creek.

With one exception, the groundwater contaminants associated with pre-landfill storage of coal and gob on the site were not present in samples collected from MW-5 and MW-7 during the 2006-2007 assessment monitoring period. Manganese was present above the Class I groundwater Standard in MW-05, but no other parameters exceeded Class I criteria. The City was not required to sample these wells after the assessment monitoring period ended. The 2008 assessment monitoring boring and well construction logs are provided in Attachment 6.

- (ii) Please identify if any of the monitoring wells are screened in the “uppermost aquifer” as defined in 35 Ill. Adm. Code 810.103.

Response: *Because closure activities were initiated for the closed Collinsville Landfill prior to September 18, 1992, 35 IAC Part 807 is applicable to the landfill. The landfill was officially designated as closed in October 1986. The Landfill Closure Plan was submitted October 27, 1982.*

35 Ill. Adm. Code 810.103 states “Uppermost aquifer” means the first geologic formation above or below the bottom elevation of a constructed liner or wastes, where no liner is present, that is an aquifer, and includes any lower aquifer that is hydraulically connected with this aquifer within the facility’s permit area.” All of the wells/piezometers except but MW-3 are screened above or below the bottom elevation of the landfill. MW-3 is located within the landfill. MW-5 and MW-7 are outside the boundary of the waste, but were installed below the elevation of the waste. The upper shallow water-bearing zone was not present in either well. However, a water-bearing zone was found at an elevation more than 10 feet below the shallow zone. Additionally, MW-2, P-6, P-5 MW -6, and P-14 are not downgradient of the landfill but are up-, side- or cross-gradient of the landfill. MW-6 is the upgradient background well. This was not known at the time MW-2, P-5, and P-6 were installed. MW-5, MW-7 and P-14 provided the water level data to document the direction of groundwater flow on the north and south side of Canteen Creek,

the west side of the unnamed creek, and the strong upward vertical gradient in a deeper water-bearing zone.

MW-3 is located within the landfill and is not downgradient or below the landfill. MW-5 and MW-7 are located in a water-bearing zone below the upper zone. Both have a very strong upward gradient not a downward gradient.

Additionally, the landfill operated under 35 IAC Part 807 not Part 810. Please note that the landfill was officially closed before 35 IAC Part 810 was promulgated and the closure process was initiated prior to September 18, 1992.

15. Exh. 3 explains MW-3 is located within the landfill. Exh. 3 at 6-7. Results for MW-3 were provided in Table 5-1.3 (Aug-07, Oct-01, Feb-08, May-08), Table 5-2.3 (Aug-08, Nov-08, Feb-09, May-09). Exh. 5-1, 5-2. Results for leachate were provided in Table 5.8-2 (Feb-14). Exh. 5-8. The petition at 3 states, "Perchlorate was not detected in the leachate sample collected in February 2013." Pet. at 3. The exhibits don't appear to contain results for leachate sampling from February 2013, although Table 5-8.2 of Exh.5-8 contains leachate results dated February 26, 2014.

- (a) Please clarify if the leachate sample referred to in the petition on page 3 is the February 26, 2014 sample shown in Table 5-8.2.

Response: *The reference to a leachate sample collected in 2013 should be revised to 2014. The first leachate sample collected to characterize leachate from the recently constructed supplemental leachate management system was collected February 26, 2014.*

- (b) Please clarify if perchlorate, Picloram, p-Dioxane, or MCPP were detected in any leachate samples, and if so, when and at what concentration.

Response: *The only leachate sample analyzed for the p-dioxane, perchlorate and MCPP was the February 2014 sample. The leachate results are provided in Tables 5-8.2 and 5-8.3. The compound p-dioxane was detected in the 2014 leachate sample at a concentration of 2.03 µg/L. Picloram, perchlorate and MCPP have not been detected in leachate samples.*

16. In Exh. 5-2 Table 5-2.5, there is a column heading entitled "Oct-07". Please clarify if this should be "Oct-08".

Response: *Yes, the date is a typographical error and should read "Oct-08." The revised table is provided in Attachment 9.*

17. Exh. 5 Tables 5-1.1, 5-1.3, and 5-1.4 provide a footnote for the analytical results for August 2007 and October 2007, stating, “[A]dditional parameters were analyzed for assessment monitoring. These parameters included unfiltered arsenic, barium, chloride, iron, manganese, sulfate, thallium, TDS, and picloram. Results are not reported under 2007-310-SP. Results were reported in the Assessment Monitoring Report submitted January 14, 2008.” Exh. 5, Table 5-1.1, 5-1.3, 5-1.4. Please provide the results referred to in this footnote

Response: *The 2008 Assessment Monitoring report tables, figures and boring/well construction logs are attached (Attachment 6).*

35 Ill. Adm. Code 104.406(e)

18. For the constituents detected in the groundwater associated with herbicides (p-dioxane, MCP, and picloram), please address whether they would attenuate naturally if there were no additional herbicide application using the same three constituents. If so, please describe how long would it take for concentrations to dissipate below the groundwater quality standards.

Response: *According to a U.S. Forestry Service investigation into specific formulations of glyphosate (1996) and a 1996, follow-up fact sheet on glyphosate, the compound p-dioxane is an unlisted ingredient present in the glyphosate stabilizer in Roundup Pro® and other widely used commercial herbicides and pesticides. As is more fully set forth in Exhibit 3 and according to the documents cited, once in the groundwater, p-dioxane is resistant to most naturally occurring biodegradation processes and can exhibit a long period of persistence. According to a USEPA January 2014 fact sheet, biodegradation rates in groundwater are currently under investigation.*

The other herbicides were infrequently detected and may represent anomalies and are not believed to be present. If present, the source is off-site use by other than the City of Collinsville. None of the chemicals are associated with the waste in the landfill. Information required to realistically evaluate or model degradation of the infrequent detection of MCP or Picloram is currently not available and the City currently does not have the resources to perform such an evaluation.

19. Please address whether other herbicides are available that would be effective in post closure care maintenance of the landfill site and that would not contain constituents listed under 35 Ill. Adm. Code 620.410(b) or 620.420(b) capable of migrating to groundwater. Additionally, address whether other herbicides are available that might migrate to groundwater but would be readily biodegradable thereby only persisting in the groundwater for a short amount of time.

Response: *Please see Exhibit 3 and the response to Comment 18 above. Federal regulations only requires the disclosure of active ingredients in pesticides and herbicides.*

Department of Agriculture's Forestry Service has shown that 1,4-dioxane is present in Roundup,® Roundup Pro,® and many other glyphosate-based herbicides (See Exhibit 3-2). Because manufacturers are not required to list 1,4-dioxane as an ingredient, the City has no means of determining if another glyphosate-based herbicide would have a lower concentration of 1,4- dioxane. Additionally, according to the U.S. Fish and Wildlife Service, glyphosate-containing herbicides are widely used in agriculture and lawn and garden care..

20. Please address costs associated with the use of alternative herbicides identified above and whether it would be economically reasonable and technically feasible for the Collinsville landfill.

Response: *The City of Collinsville does not have the ability or resources to provide this information.*

21. Instead of permanently adjusting the groundwater quality standards for the constituents associated with herbicide use (picloram, p-Dioxane and MCPP), please address whether Collinsville could switch herbicide products, put an institutional control on property that only readily biodegradable herbicide products may be used, and wait for the groundwater quality to reach steady-state compliance with the groundwater quality standards for picloram, p-Dioxane and MCPP.

Response: *Please see the response to comments 19 through 21. Evaluating the fate of p-dioxane and assessing alternative herbicides is beyond the City's resources.*

Based on their infrequent detection, MCPP and Picloram are most likely not present at the Site. Evaluating MCPP and Picloram whose source, if present, is off-site use is not practical or reasonable. MCPP was detected once only in a duplicate sample and Picloram was detected twice at concentrations near the detection limit.

22. Exh. 1 refers to "Area 1, Coal/Gob Storage Area", which was "present on both sides of Canteen Creek...and was located along the northern perimeter of the current project site." Exh. 1 at 1. Figures B-1 through B-12 and 4-1 show a portion of Area 1 lies outside the boundary of landfill waste but inside the Collinsville landfill property boundary. Exh. 1, Exh. 4.

- (a) Please address whether the portion of Area 1 outside the landfill waste boundary has been capped.

Response: *The area outside the landfill boundary between the road and Canteen Creek has not been capped. Further, this area includes property not owned by the City,*

- (b) Please address whether a new cap over the portion of Area 1 within the Collinsville Landfill property boundary and outside the landfill waste boundary has the potential to permanently reduce levels of constituents in the requested adjusted standard to below the applicable groundwater standards. Please explain if such a cap would minimize infiltration into the historic gob materials and thereby reduce acid mine drainage attributed to the leaching of constituents from the soil to the groundwater. If so, address the potential costs associated with this option.

Response: *Capping the portion of the coal/coal waste located outside of the landfill that is owned by the city will have no impact on groundwater directly downgradient of the landfill. The property is on the north side of the creek and is not downgradient from the landfill. Additionally, the uncapped portion is relatively narrow, is located between Lebanon Road and Canteen Creek, and is not exclusively owned by the City.*

Any changes that might impact Canteen Creek could result in damage to the landfill or Lebanon Road. P-14 and MW-5 are located on the northern side of the landfill. P-14 was installed in an upper shallow water-bearing zone absent in MW-5. The only parameter in either well/piezometer that exceeded Class I groundwater standards was manganese. Based on aerial photos, the majority of the material located on the north side of the creek was coal ready for shipment via the adjacent railway. The pyrite rich gob was stored on the south side of the creek. Please see Figure B-5 in Attachment 7. The piles on the north side of the creek are different and coal was found in the soil core at P-14. Coal, ready for shipment does not create the magnitude of contaminants associated with gob piles.

The majority of infiltration into the landfill comes from the upgradient surface impoundments located south of the landfill. Capping the area owned by the City on the north side of the creek would have no impact on the infiltration of water from the surface water impoundments into the landfill. The 1991, 2008, and recent water table maps are available for your review (Attachments 3, 4, and 6).

- (c) The Surface Coal Mining Land Conservation and Reclamation Act addresses lands “affected by surface and underground coal mining”. 225 ILCS 720. Address whether capping the portion of Area 1 within the Collinsville Landfill property boundary and outside the landfill waste boundary could be considered a mine reclamation project pursuant to the Surface Coal Mining Land Conservation and Reclamation Act [225 ILCS 720] and 62 Ill. Adm. Code 1700 through 1850. If so, please address the costs and benefits of doing so.

Response: *Canteen Mine #2 and all the mines that once operated in the area were underground mines. Mining ceased on the property in 1950. 62 IAC Parts 1700-*

1850 were promulgated and effective on June 1, 1982. The law is applicable to surface and some underground mining and reclamation activities, future mining and reclamation activities, and coal exploration from 1992 onward. The law is not applicable to subsurface mining that ended in 1950. Additionally, the site is a former municipal landfill.

Capping an area with limited impact (manganese exceeded Class I criterion) that is not downgradient of the landfill would provide little benefit at considerable expense. The majority of the coal/gob waste is beneath the capped landfill. The source of the coal waste, coal mining prior to 1951, has nothing to do with the landfilled municipal waste.

35 Ill. Adm. Code 104.406(f)

23. IEPA stated, “[T]here does not appear to be any specific proposed language for a Board order...” Rec. at 4. Exh. 8 presents proposed standards for listed parameters in table format that also includes “Notes/Comments” and “Source”. Additionally, Collinsville requests the adjusted standard provide “for those inorganic parameters not specifically identified, Class II groundwater standards shall apply.” Pet. at 9-10 (paragraph 17). Please provide specific proposed language for a Board order, listing each constituent, the adjusted standard value or citation to the Class II groundwater quality standards, and proposed sampling frequency without the “Notes/Comments” and “Source” columns contained in Exh. 8.

Response: *Exhibit 8 has been revised and is provided in Attachment 1.*

24. Please propose adjusted standard language to clearly identify the vertical and horizontal boundaries within which the adjusted groundwater quality standards would apply by identifying the affected water bearing unit and by supplying a legal description and a map delineating the portion of the landfill property to which the adjusted standard would apply.

Response: *The City proposes adjusted standards that are applicable to the area shown in Attachment 4 that includes groundwater downgradient or adjacent to the landfill, the background well MW-6, the area where coal, coal residuum, and gob were stored, and the groundwater associated with the City property located north of Canteen Creek. The legal description of the property is provided in Attachment 5.*

25. The petition states that the proposed adjusted standards are based on:
1. “the highest or lowest (pH concentration) detected and the estimated future concentrations” for TDS, Chloride, Manganese, Sulfates, pH, Perchlorate, MCP, and p-Dioxane.

2. Class I standard for sulfate
3. “background concentrations established at the site” for iron;
4. Class II standard for Picloram; and
5. Class II standard for “those inorganic parameters not specifically identified” in Exh. 8. Pet. at 9-10, Exh. 8.

For the each of the parameters listed in Exh. 8, please provide supporting documentation for the basis of the proposed adjusted standard values as is more specifically addressed below.

Response: Please see the response to Comment 4(c) and Attachment 1.

- (a) The petition contains information regarding the statistical analysis for background concentrations for MW-6. Exh. 5-4, App. E, Table 1, 2, 14; Exh. 5-7, App. A, Table 3; Exh. 7 at 15-17, App. A, Table 4. However, the record does not contain any statistical analysis to support the proposed adjusted standard values, including those greater than the highest detected values. The Board has previously required that a statistically valid value for a proposed adjusted groundwater quality standard be addressed. See Petition for Adjusted Standard from 35 Ill. Adm. Code 620.420 for Nobel Risley’s Landfill No. 2 (AS 08-3), slip op. at 3 (Nov. 1, 2007). Please provide statistically valid values for the each of the proposed adjusted groundwater quality standards in Exh. 8 and the accompanying statistical analysis addressing outliers, normality, trends, mean, standard deviation, and upper confidence limit (UCL). See AS 08-3 Second Amended Petition (Feb. 28, 2008), Exh. 8.

Response: The proposed adjusted standards for those chemical that are associated with pre-landfill mining activities will be the existing concentrations. This includes TDS, arsenic, chloride, iron, manganese, pH, and perchlorate. The City would also like to address concentrations of ammonia, boron, sulfate, TOC, TOX, and zinc that do not exceed Class I Groundwater Quality standards, but exceed background concentrations.

For p-dioxane, present as a result of post landfill usage of the herbicide Roundup Pro®, the proposed adjusted standard is the highest detected concentration of 51 ug/L. The herbicides Picloram and MCPP have been detected infrequently (once for MCPP and twice for Picloram) and are believed to be laboratory anomalies. The two herbicides will be deleted from the list of parameters requiring adjusted standards.

- (b) For constituents where the requested adjusted standard is based on “the estimated future concentrations” (Pet. at 10), please provide the method, modeling, and calculations used to determine the estimated future concentrations.

Response: *With the exception of p-dioxane, the proposed adjusted standards have been revised to the existing concentrations. The proposed adjusted standard for p-dioxane will be the highest concentration detected or 51 ug/L.*

(c) **Picloram**

An adjusted standard is requested for Picloram of 5 mg/L based on the Class II water quality standard. (Exh. 8.) The petition states, “The herbicide, picloram, has been periodically detected in the background well, MW6, but not at levels of regulatory concern.” Pet. at 5. However, the record indicates Picloram was detected a only single time in MW-6, the background well, in the results dated November 2007 at a concentration of 0.000942 mg/L. Exh. 5-4, Table 14 (Version 3). The 99% Confidence Limit for picloram in Table 3 (Exh. 5-7, App. A) is 0.00094 mg/L. The Class I water quality standard is 0.5 mg/L.

- (i) Please clarify if picloram was detected at any other time or in any other well besides in November 2007 in MW-6 and in what concentration.

Response: *Picloram has been detected twice out of a large number of sampling events: Once in April 2005, in the background well MW-3 at a concentration of 0.234 ug/L and in November 2007, in the new background well MW-6 at a concentration of 0.942 ug/L.*

- (ii) Please explain why an adjusted standard from the Class I water quality standard is necessary for picloram since it was detected below the Class I standard and the single detection occurred nearly 8 years ago.

Response: *After further evaluation, an adjusted standard is not required for Picloram. The detections near the boundary of the landfill at concentrations very close to the detection limit and slightly over the background concentration indicate either instrument drift (instrument noise instead of a true detection), a laboratory anomaly, or extremely infrequent use of the herbicide by neighboring property owners.*

- (iii) Please provide justification for basing the requested adjusted standard on the Class II standard of 5.0 mg/L, which is greater than the Class I standard and the 99% UCL of 0.00094 mg/L.

Response: *Picloram has been withdrawn from the list of parameters requiring adjusted standards.*

(d) P-Dioxane

The petition states, “the proposed Adjusted Standards for ... p-dioxane ... will be based on a value associated with the maximum detected concentrations.” Pet. At 9. The proposed adjusted standard for p-dioxane does not appear to be based on the current maximum detected concentrations, but rather is greater than the maximum detected concentrations. P-Dioxane has a highest detected value of 0.0129 mg/L and a proposed adjusted standard of 0.025 mg/L. Please provide justification for a requested adjusted standard for p-Dioxane that is greater than the highest detected value.

Response: *The proposed adjusted standard for p-dioxane has been revised to the highest detected concentration of 51 ug/L.*

(e) MCPP

An adjusted standard is requested for MCPP of 0.20 mg/L. The highest and only detected value for MCPP appears to be 0.0097 mg/L in November 2013 for MW-1. The petition states, “MCPP was detected above Class I Groundwater Standards [0.007 mg/L] in one duplicate sample collected in November 2013, but was not detected in the corresponding field sample or any samples collected during the first, second or third quarters of 2014 or the February 2013 leachate sample...[B]ased on lack of reproducibility or multiple detections of MCPP, its one-time detection is considered an anomaly – an artifact of field, sample shipment or laboratory activities”. Pet. at 3-4. Further, the petition states that MCPP is “not believed present”. Exh. 8. Petition states, “[T]he proposed Adjusted Standards for ... MCPP will be based on a value associated with the maximum detected concentrations.” Pet. at 9. The proposed adjusted standard for MCPP does not appear to be based on the maximum detected concentrations, but rather is greater than the maximum detected concentration.

- (i) Please provide justification for a requested adjusted standard for MCPP that is greater than the highest detected value.

Response: *After further evaluation, an adjusted standard is not required for MCPP. The one-time detection is considered a laboratory anomaly as stated above and is not believed to be present in the groundwater.*

- (ii) Please address whether an adjusted standard for MCPP is necessary since the reported detection is considered an “anomaly” due to an artifact of sampling or analysis.

Response: *MCPD has been withdrawn from the list of parameters requiring adjusted standards.*

(f) TDS

The petition states that the proposed adjusted standard for TDS is “[b]ased on the highest...concentration) detected and the estimated future concentrations.” Pet. At 10. The highest detected value for TDS is 1,660 mg/L, however, the proposed adjusted standard is 2,500 mg/L. The Class I and II standards are 1,200.0 mg/L.

Please provide justification for a requested adjusted standard for TDS that is greater than the highest detected value.

Response: *The proposed adjusted standard for TDS (Attachment 1) has been revised to the existing concentration in a manner similar to 35 IAC 620(c). The source of the TDS is the pre-landfill storage of gob that was incorporated into the northern half of the landfill.*

(g) Chloride

For chloride, Exh. 8 indicates the “Highest detected value to date” is 492 mg/L, and the proposed adjusted standard value is 600 mg/L. The tables in the record do not appear to contain information regarding the value of 492 mg/L. In the petition, the highest value for chloride appears to be 451 mg/L (Exh. 5-7, App. A, Table 2, MW-1, May 2013).

(i) Please provide supporting documentation for the highest value detected to date for chloride.

Response: *The highest concentration of chloride was 451 mg/L detected as indicated at MW-1 in May 2013. Please see Exhibit 5-7, Appendix A, Table 2.*

(ii) Please provide justification for a requested adjusted standard for chloride that is greater than the highest detected value.

Response: *The proposed adjusted standard for chloride (Attachment 1) has been revised to the existing concentration in a manner similar to 35 IAC 620(c). The source of the chloride is the pre-landfill storage of gob that was incorporated into the northern half of the landfill.*

(h) Iron

For iron, the petition states that the highest value detected to date is 18.8 mg/L (138 mg/L from a turbid well), and that the proposed adjusted standard of 69 mg/L is “based on background concentrations”. Pet. at 10, Exh. 8. The petition contains information regarding the highest value of 18.8 mg/L (Exh. 5-3, Table 53.3, MW-4, May 2010), however, it does not appear to contain documentation regarding the 138 mg/L reading in a turbid well. The petition also does not appear to contain information regarding background concentrations to support a value of 69 mg/L. The petition indicates MW-6 is the background well, and the highest reading in the record appears to be 1.920 mg/L from February 2007 and the most recent background UCL is 0.04 mg/L. Exh. 5-7, App. A, Table 3.

- (i) Please provide supporting documentation regarding the 138 mg/L reading in a turbid well and background concentrations that support a value of 69 mg/L.

Response: *The 2006-2007 Assessment Monitoring tables, figures, and boring logs are provided in Attachment 6 and Revision 3 of the background statistical evaluation for the MW-6 is provided as Attachment 10. The laboratory data sheet and the Field Data Log for the November 2006 sample collection at MW-2 that contained 138 mg/L of iron is provided in Attachment 11. The initial water level for MW-2 indicated less than 2 feet of water in the well. The well purged dry after the collection of 0.55 gallons of groundwater. The well was allowed to recharge and the sample was collected. There was insufficient water to collect the routine filtered samples for the 4th Quarter monitoring for 2006. The sample was extremely turbid (Please see Attachment 11).*

- (ii) Please provide justification for a requested adjusted standard for iron that is greater than the highest detected value.

Response: *The proposed adjusted standard for iron (Attachment 1) has been revised to the existing concentration in a manner similar to 35 IAC 620(c). The source of the iron is the pre-landfill storage of gob that was incorporated into the northern half of the landfill.*

- (i) Manganese

For manganese, Exh. 8 indicates the “Highest detected value to date” is 20.6 mg/L and the proposed adjusted standard is 25 mg/L. The tables in the record do not appear to contain information regarding this value of 20.6 mg/L. In the petition, the highest value for manganese appears to be 16.4 mg/L (Exh. 5-1, Table 5-1.4, MW-4, February 2008). For manganese, a value of 0.206 mg/L was recorded for MW-6, May 2011. Exh. 5-5, Table 5-5.4.

- (i) Please provide supporting documentation for the highest value detected to date for manganese.

Response: *The concentration of 20.6 mg/L for unfiltered manganese was reported in the groundwater sample collected from MW-4 in February 2007 during the 2006-2007 Assessment Monitoring period. Please see Table 5 in Attachment 6. The laboratory data sheet and Field Data Log for MW-4 for this sample are provided in Attachment 12.*

- (ii) Please provide justification for a requested adjusted standard for manganese that is greater than the highest detected value.

Response: *The proposed adjusted standard for manganese (Attachment 1) has been revised to the existing concentration in a manner similar to 35 IAC 620(c). The source of the manganese is the pre-landfill storage of gob that was incorporated into the northern half of the landfill.*

(j) Sulfate

- (i) Since Collinsville states that Class I standards already apply to the landfill site, please clarify the rationale for requesting an adjusted standard for sulfate of 400 mg/L that is equal to the Class I standard of 400 mg/L.

Response: *Sulfate concentrations do not exceed Class I Groundwater Quality Standards but do exceed background values. According to the City's Supplemental Permit 2014-504-SP, an exceedance of background values constitutes a significant change in groundwater quality. Gob was not stored at background locations and background values are not applicable to coal-related contaminants in the landfill. For those coal mining -related compounds and p-dioxane that exceed background concentrations, the City proposes to eliminate the comparison to background values.*

- (ii) For sulfate, Exhibit 8 indicates the "Highest value detected to date – 159 mg/L". According to Exh. 5.2, Table 5-2.2 for MW-2, a value of 188 mg/L was detected for sulfate in the November 2008 sampling. Please explain if this higher value of 188 mg/L would affect the rationale Collinsville used to arrive at the proposed limit of 400 mg/L that is based on Class I standards.

Response: *The 159 mg/L is a typographical error and the highest value is 188 mg/L. Please see the response to comment 25(j)(i) above for the*

rationale for including sulfate. The proposed adjusted standard for sulfate has been revised.

(k) pH

The petition states the proposed adjusted standard for pH of 5.0-9.0 is “[b]ased on the...lowest (pH concentration) detected and the estimated future concentrations.” Pet at 10. The lowest pH detected was 5.37 in MW-2 for February 25, 2014. Exh. 5-8, Table 5-8.2.

- (i) Please provide justification for a requested adjusted standard for pH that is less than the lowest detected value.

Response: *The proposed adjusted standard for pH (Attachment 1) has been revised to the existing pH value in a manner similar to 35 IAC 620(c). The source of the acidic conditions is the pre-landfill storage of gob that was incorporated into the northern half of the landfill.*

- (ii) In its request for an adjusted standard for pH, Collinsville only indicates an adjusted numeric value of “5-9 pH units”. Exh. 8. For some other parameters, Collinsville has requested adjusted standards based on the Class II standards. Please clarify if Collinsville requests an adjusted standard from the Class I standards for pH at Section 620.410(e) that also includes the wording of the Class II standards at Section 620.420(e) such that the adjusted standard for pH only applies “within 5 feet of the land surface” and “[e]xcept due to natural causes”. See 35 Ill. Adm. Code 620.420(e).

Response: *The proposed adjusted standard for pH (Attachment 1) has been revised to the existing pH value in a manner similar to 35 IAC 620(c). The source of the acidic conditions is the pre-landfill storage of gob that was incorporated into the northern half of the landfill.*

(l) Perchlorate

Petition states, “the proposed Adjusted Standards for perchlorate,...will be based on a value associated with the maximum detected concentrations.” Pet. at 9. Perchlorate has a highest detected value of 0.051 mg/L and a proposed adjusted standard of 0.065 mg/L. Exh. 5-8, Table 5-8.1; Exh. 8. Please provide justification for a requested adjusted standard for perchlorate that is greater than the highest detected value.

Response: *The proposed adjusted standard for perchlorate has been revised to the existing concentration in a manner similar to 35 IAC 620.440(c). Though*

perchlorate is not mentioned in the standard, other explosive compounds are. During the earliest days of coal mining at the site, perchlorate containing explosives were used during subsurface coal mining activities, specifically blasting.

- (m) Although not enunciated in Exh. 8 “Summary of Proposed Adjusted Standards and Parameters to be Adjusted”, paragraph 17 of the petition states that Collinsville petitions that “for those inorganic parameters not specifically identified [in Exh. 8], Class II groundwater standards shall apply.” Pet. at 9.

Response: *The constituents present as a result of coal mining activities at the site include TDS, arsenic, chloride, iron, manganese, perchlorate, pH, ammonia, boron, TOC, TOX, sulfate, and zinc. TDS, arsenic, chloride, iron, manganese, perchlorate, and pH exceed Class I groundwater standards and background values. The proposed adjusted standards for these compounds are the existing concentrations. The concentrations of ammonia, boron, sulfate, TOC, TOX, and zinc exceed background values but not Class I standards. An exceedance of background values constitutes a significant change in groundwater quality. Gob was not stored at background locations and background values are not applicable to coal-related contaminants in the landfill. For those coal mining related compounds that exceed background concentrations, the City proposes to eliminate the comparison to background values.*

- (i) Since Collinsville states, “The City of Collinsville closed landfill is currently subjected to Class I Groundwater standards” (Pet. at 9), please provide additional justification regarding each of “those inorganic parameters not specifically identified” for which Collinsville seeks to apply the Class II groundwater quality standards consistent with the petition process of 35 Ill. Adm. Code 104.406 and 104.426.

Response: *Please see the response to Comment 25(m) above. The proposed adjusted standard for arsenic is the existing concentration, but the City proposes to either eliminate the comparison to background values for those compounds associated with former coal mining activities or p-dioxane. The source of the additional compounds (ammonia, boron, sulfate, TOC, TOX, and zinc) was addressed in the 2008 Groundwater Assessment Report. The 2008 tables, figures and boring logs are provided in Attachment 6. All parameters included in the Petition, are now identified in the revised Exhibit 8 (Attachment 1).*

- (ii) Based on the information provided in Exh. 5, only one of “those inorganic parameters not specifically identified” in Exh. 8, arsenic, appears to have exceeded the Class I groundwater quality standards. Arsenic was detected

at 0.0176 mg/L in May 2010 (Exh. 5-3, Table 5-3.3, MW-4), 0.0142 mg/L in May 2011 (Exh. 5-5, Table 5-5.3, MW-4), and 0.0137 mg/L in May 2012 (Exh. 5-6, Table 5-6.3, MW-4), however, all of these detections were below the Class I standard of 0.050 mg/L that applied at the time. For the new Class I standard of 0.010 mg/L that was revised in 2012 (R08-18), arsenic was detected above the standard at 0.0109 mg/L in November 2013 (Exh. 3, Table 1; Exh. 5-8, Table 5-8.1) and 0.0232 mg/L in May 2013 (Exh. 5-7, App. A, Table 3, MW-4), but not above the Class II standard of 0.20 mg/L.

Please clarify if any of the other “inorganic parameters not specifically identified” in Exh. 8, besides arsenic, have ever exceeded Class I groundwater quality standards. If not, please explain why an adjusted standard for these parameters is necessary.

Response: *All parameters and their proposed adjusted standards are identified in the revised Exhibit 8 (Attachment 1). With the exception of arsenic, the remaining compounds have not exceeded Class I Standards. Groundwater standards do not apply to TOC and TOX. Ammonia, boron, sulfate, TOC, TOX, and zinc exceeded background values. A concentrations that exceeds background is considered a significant changes in groundwater quality. The proposed adjusted standard for arsenic is the existing concentration, but the City proposes to eliminate the comparison to background values for those compounds associated with former coal mining activities and p-dioxane.*

- (iii) If the request to apply Class II standards to “those inorganic parameters not specifically identified” is based on “estimated future concentrations”, as Collinsville stated for the parameters that were specifically identified in Exh. 8 (Pet. at 10), please provide the method, modeling, and calculations used to determine the estimated future concentrations.

Response: *The proposed adjusted standards have been revised and each parameter and the proposed standard are identified in Attachment 1. The City is not recommending Class II standards and the rationale for the selection of the proposed standard is provided in the response to Comment 25(m)(ii). For those coal mining related compounds and p-dioxane that exceed background concentrations, the City proposes to eliminate the comparison to background values. The revised proposed standard for arsenic is the existing concentration.*

- (iv) Please clarify if Collinsville is seeking the Class II groundwater quality standards to apply to “those inorganic parameters, even if there is a

revision to the Class II numeric groundwater quality standards or an addition of new parameters.

Response: *Collinsville is not seeking to apply the Class II Groundwater Quality Standards. For those coal mining related compounds and p-dioxane that exceed background concentrations, the City proposes to eliminate the comparison to background values. The parameters have been added to the revised Exhibit 8 (Attachment 1).*

- (v) Provide specific wording for an adjusted standard for the “inorganic parameters not specifically identified” in Exh. 8. For example, include the name for each of the inorganic parameters and a specific numeric standard, or include wording such that the standards of 35 Ill. Adm. Code 620.420(a) Inorganic Chemical Constituents apply, except for those constituents identified in Exh. 8.

Response: *For those coal mining related compounds and p-dioxane that exceed background concentrations, the City proposes to eliminate the comparison to background. The parameters have been added to the revised Exhibit 8 (Attachment 1).*

26. Address efforts necessary to achieve this proposed adjusted standard and present the corresponding costs per 35 Ill. Adm. Code 104.406(f).

Response: *The groundwater at the site complies with the proposed adjusted standards. As such, there is no additional effort required to achieve compliance.*

The costs for remediating the pre- and post-landfill contaminants or any parameter to Class I Groundwater Quality Standards are provided in Exhibit 6-1 of the petition submitted December 4, 2014. Remedial measures include removal of the landfill, installation of an interceptor trench and leachate treatment, and installation of a pump and treat system. Costs for each alternative exceed \$10,000,000 and the sole remedial alternative most likely to clean up the Site without years of operation and maintenance (removal of the landfill) is the most expensive. The 2014 estimate for landfill removal was \$234,272,521. Costs for each remedial alternative is beyond the resources of a City the size of Collinsville.

35 Ill. Adm. Code 104.406(g)

27. The Memorandum of Understanding between Collinsville and IEPA (Exh. 2-1) refers to Attachment A (copy of the groundwater or water well ordinance), Attachment B (identification of the legal boundaries within which the ordinance is applicable), and Attachment C (statement of authority). A copy of the groundwater control and usage

Ordinance No. 3747 was included in Exh. 2-1, however, the record does not contain Attachment B or C. Please provide Attachments B and C.

Response: *For more than 10 years, the City ordinance and MOU that prohibit the installation of new potable water wells were believed to include the Closed Collinsville Landfill. During the preparation of responses to the Board's comments, we discovered the ordinance and MOU do not cover the landfill. The City of Collinsville is committed to working with the IEPA during the next several months to address this issue in the most appropriate way that will prohibit the installation of potable water wells along Lebanon Road near the landfill and gain the approval of the IEPA and the Board.*

28. Collinsville states, "The MOU and Ordinance, presented in Exhibit Two, prohibit the installation or use of private groundwater wells for use as a potable water supply within the corporate boundaries of the City except at points of withdrawal by the City." Pet. at 10. Ordinance No. 3746 authorized the MOU. Exh. 2-1. The MOU addresses the installation and use of potable water supply wells by the City of Collinsville itself. Exh. 2-1. Section II of the MOU requires Collinsville to review only "a registry of sites within its corporate limits that have received 'No Further Remediation' determinations from the Illinois EPA" prior to citing public potable water supply wells. Exh. 2-1. Ordinance No. 3747, Section 2.A prohibits the use of "groundwater from within the corporate boundaries of the City" as a potable water supply by any person other than the City of Collinsville. Exh. 2-1.

Although the MOU and Ordinance 3747 refer to only groundwater and sites within the City of Collinsville corporate limits, the petition states, "The Site is described as a closed sanitary landfill along Lebanon Road due east and *outside the city limits of Collinsville, Illinois.*" Pet. at 6, emphasis added. On the other hand, IEPA appears to be under the impression that the Collinsville landfill is within the City limits because IEPA states that the MOU and Ordinance apply "within city limits, which includes the Landfill". Rec. at 4.

- (a) Please clarify if there is a difference between the City of Collinsville "corporate limits" and "city limits", and if the Collinsville landfill is located in whole or in part within the corporate limits of the City of Collinsville.

Response: *No, the City owns the property but apparently the landfill is outside city limits.*

- (b) Please provide a map showing the Collinsville landfill in relation to the City of Collinsville corporate and/or city limits.

Response: *A map showing the city limits on the eastern side of the city and the location of the landfill is provided as Attachment 13. The location of the City*

limits was obtained from the Madison County GIS database. The landfill is approximately 1.25 miles east of the City.

- (c) Please clarify if the Collinsville landfill is located inside the City of Collinsville corporate limits, but is not contiguous with the main corporate limits.

Response: *No, the City owns the property but apparently the landfill is outside city limits.*

- (d) Please clarify on the map what areas adjacent to and surrounding the Collinsville landfill are located inside and outside the City of Collinsville corporate limits. Also, identify the boundaries for other municipalities or the county on the map, if the landfill does not exist completely within the city limits of Collinsville.

Response: *The City owns the property but apparently the landfill is outside city limits in Madison County, Illinois. No other municipalities are located near the landfill.*

- (e) Please clarify if the Collinsville landfill would be included in the “registry of sites within [the City of Collinsville] corporate limits that have received ‘No Further Remediation’ determinations” from IEPA. Exh. 2.

Response *To the knowledge of the City attorney and Mr. Rod Cheatham, City Representative for the Closed Collinsville Landfill, the landfill is not listed on the City’s registry of sites.*

- (f) Please clarify if the MOU and Ordinance 3747 would apply to the installation of wells or use of groundwater as a potable water supply by any person or the City of Collinsville on the Collinsville landfill and/or the surrounding adjacent properties if they are located outside the corporate limits. If not, please indicate if Collinsville will be preparing another ordinance, MOU, Environmental Land Use Control, Environmental Covenant (in accordance with the Uniform Environmental Covenants Act [765 ILCS 122]), and/or an alternative instrument authorized for environmental uses under Illinois law and approved by the Agency applicable to the Collinsville Landfill and surrounding properties.

Response: *For more than 10 years, the City ordinance and MOU that prohibit the installation of new potable water wells were believed to include the Closed Collinsville Landfill. During the preparation of responses to the Board’s comments, we discovered the ordinance and MOU do not cover the landfill. The City of Collinsville is committed to working with the IEPA during the next several months to address this issue in the most appropriate way that will prohibit the installation of potable water wells along Lebanon Road near the landfill and gain the approval of the IEPA and the Board.*

- (g) The Board has required Environmental Land Use Controls (ELUC) prohibiting the use of groundwater for potable purposes in similar adjusted standards even where an ordinance exists. *See*, e.g. Petition by Hayden Wrecking Corporation for an Adjusted Standard from 35 Ill. 620.410(a), AS 04-3, slip op. at 8, 11, 20 (Jan. 6, 2005) (“Even if the City of Madison rescinds its ordinance forbidding the use of the groundwater beneath the Hayden site as a source of potable drinking water, an institutional control will remain in effect until the Agency modifies or removes it.”) and Petition of the Village of Bensenville for an Adjusted Standards from 35 Ill. Adm. Code 620.410 Regarding Chloride, AS 05-2, slip op. at 5, 17 (Oct. 20, 2005). The MOU (Exh. 2) expressly refers to the Ordinance 3747 and specifies the responsibilities to be assumed by the unit of local government, however, the MOU alone does not prohibit the use of groundwater for potable purpose if the ordinance is rescinded or modified. Please comment on the inclusion of an institutional control (ELUC) prohibiting the use of groundwater for potable purpose that will be recorded with the county recorder’s office and remain in effect until IEPA modifies or removes it, as a condition of the adjusted standard.

Response: *The City of Collinsville is committed to working with the IEPA during the next several months to address this issue in the most appropriate way that will prohibit the installation of potable water wells along Lebanon Road near the landfill and gain the approval of the IEPA and the Board.*

29. The petition states, “A water well survey was performed in 2000 to identify private potable water wells located within 1,300 feet from the landfill boundary. The survey revealed that property owners, immediately adjacent to and less than 300 feet downgradient of the closed landfill (within the path of the impacted groundwater), used City water.” Pet. at 11. Further, the petition states, “There are no potable water supply wells within 1,300 feet downgradient of the landfill.” Pet. at 11.

- (a) Since the water well survey was conducted 15 years ago in 2000 and the Ordinance and MOU were not in place until 2006, please address whether a more current survey might identify potentially affected wells that were installed in the interim.

Response: *Very little has changed in the Canteen Creek valley along Lebanon Road and no new development has occurred. A simple water well survey was performed in July 2015 using the Illinois State Geological Survey Water Well Database. The current system allows you to accurately measure the distance from the site to water well locations. The previous survey radius was identified as 1,300 feet (¼ mile) but was actually a radius of 1,800 feet. Using a half mile or 2,500-foot radius, 18 private water wells are located within a half mile of the site. The depths of the wells range from 29-51 feet except a former Cantine Mine shaft. The mine shaft is 196 feet deep and is at an elevation of 500 feet amsl.*

The 11 wells identified in the 2000 water well survey were also identified in the current survey. A map of the 18 water wells located with 2,500 feet of the landfill is provided in Attachment 14.

Of the 18 wells, 11 of them are located along the top or sides of the ridges surrounding Lebanon Road and Canteen Creek or in another valley where groundwater discharges to a north-south trending branch of Canteen Creek. The wells located on ridges are above the elevation of the landfill and those located along a north-south branch of the creek are cross or side gradient to the landfill. One well was located 1,765 feet upstream of the landfill. Four wells are located approximately 1,800 feet downstream of the landfill and were all included in the 2000 water well survey as <1,300 feet from the landfill. The direction of groundwater flow at well locations 1,800 feet downstream would be side or cross-gradient of the landfill at this distance. The remaining two wells one located 834 feet and 270 feet west of the landfill, respectively. Both are side gradient to the landfill. Residents at these locations were identified in the 2000 well survey as using municipal water as their source of drinking water. No community or municipal wells were located within 2,500 feet. The original 2000 well survey is included in the 2000 Assessment Plan and is provided as Attachment 15.

- (b) Please describe the reason for using 1,300 feet from the landfill boundary as a perimeter for the water well survey.

Response: *The reason for using a 1,300 or 1/4 mile radius (actually a 1,800-foot radius) was not discussed in the 2000 Assessment Plan (Attachment 16). However, there are two possible reasons: 1). For Phase I Environmental Site Assessments, upgradient groundwater contamination located within a quarter mile of a site is typically considered a Recognized Environmental Condition (REC). If the contamination is located more than a quarter mile upgradient, the contamination is typically not identified as a REC; and 2). The rules for performing a water well survey may have been different in 2000.*

- (c) If no potable water wells were identified within 1,300 feet downgradient of the landfill, at what distance was the closest downgradient potable well found?

Response: *In the recent well survey discussed above, no water wells were found within 2,500 feet **downgradient** from the site. Whether or not any of the wells identified in the well survey are used as potable water sources is not ascertainable from the available information. The condition or use of the wells identified in the database has not been verified. The well records are posted after the wells are installed. In order to determine which wells are currently used for potable purposes, each owner would have to be contacted. However,*

City water is available to all properties along Lebanon Road from the City to further east of the landfill.

- (d) The petition states, "City water is available to all persons in the general area of the landfill." (Pet. at 10.) Indicate whether city water is currently provided to all persons on properties within 1,300 feet of the Collinsville landfill.

Response: *This type of information is not readily available due to privacy laws. In order to determine which wells are currently used for potable purposes, each well owner would have to be contacted. The well owner listed in the database may not correspond to current landowners. Contacting possible well owners seems unnecessary because based on the direction of groundwater flow, there are no potable wells downgradient of the shallow groundwater contamination at the landfill.*

30. The Groundwater Impact Map (Exh. 4, Figure 4-1) depicts impacted groundwater from the gob storage and landfill with red and pink outlining. The outlines all appear to be within the landfill property boundary. In Figure 4-1 (Exh. 4), MW-2 and MW-5 appear to be offsite downgradient wells, and MW-7 appears to be located onsite near the downgradient property line. MW-2 only showed exceedances below the Class I pH standard. No data was provided for MW-5 and MW-7.

Response: *Please see response to Comments 9, 10, 11 and 12(a). Figure 4-1 has been revised. The 2008 assessment monitoring water table maps are included in Attachment 6. MW2 is not downgradient but is cross gradient (side gradient) of the landfill. The upper water-bearing zone discharges to the Canteen Creek. The direction of groundwater flow on the western side of the unnamed creek flows eastward toward the unnamed creek or northward toward Canteen Creek. Flow on the eastern side (landfill side) of the western unnamed creek flows westward or northward. MW-5 is located on City property and was installed as a part of the 2006-2008 Assessment Monitoring. Revised figures are included in Attachments 7 and 8.*

- (a) Please clarify if Collinsville has identified off-site groundwater impacts from the landfill property.

Response: *No off-site impacts from the landfill have been identified above Class I Groundwater Quality Standards. Groundwater results from MW-2 (low pH) and MW-6 (manganese slightly above background but above Class I) have occasionally exceeded Class I criteria, but MW-2 is not downgradient from the landfill. MW-6 is the background well. The upstream surface water exceedances for iron and manganese are not related to the landfill nor are the downstream surface water exceedances for the same parameters. The source of the surface water exceedances was the drought conditions at the time of the sampling which resulted in turbid samples (See response to Comment 32).*

- (b) For offsite wells with exceedances of constituents for which Collinsville requested an adjusted standard, except for those due to natural causes or as provided in 35 Ill. Adm. Code 620.450, please address whether the offsite property owners were notified of the adjusted standard petition. If not, please provide contact information for those property owners.

Response: *No off-site groundwater exceedances of Class I standards are a result of the buried waste or the gob pile in the landfill. MW-2 and MW-6, are currently the only monitored wells located outside the landfill property. MW-6 is the background well. MW-2 has occasionally had an exceedance of pH, or iron (when the well was almost dry and the sample was turbid) but the well is side gradient to the landfill and not downgradient.*

No off-site landowners have been directly contacted as part of this application, though a brief description of the content was printed in the local Collinsville paper.

- (c) Please address which class of groundwater quality standards would apply at the edge of the Collinsville property boundary.

Response: *Class I Groundwater Quality Standards apply to the offsite locations.*

- (d) Please address whether the applicable groundwater quality standards will be achieved at the edge of the Collinsville landfill property boundary under the adjusted standard.

Response: *Yes, applicable groundwater quality standards will be achieved at the edge of the Collinsville landfill property boundary under the adjusted standards except for MW-6. Concentrations of perchlorate and p-dioxane at MW-6 do not exceed Class I criteria, but manganese slightly exceeds the Class I criterion and has since the well was first installed and sampled.*

- (e) Please provide supporting documentation demonstrating that the requested adjusted standard will not result in offsite impacts above the applicable groundwater quality standards.

Response: *Please see the response to Comments 9, 10, 11 and 12(a). Due to the presence of the strong upgradient and the direction of groundwater flow, shallow groundwater at the landfill discharges to Canteen Creek and the northern upstream end of the western unnamed creek. Unless the groundwater hydrology changes, groundwater beneath and adjacent to the landfill will not impact off-site locations.*

31. Exh. 7-1 states, "According to Supplemental Permit No. 2014-234-SP, if concentrations exceed Class I Groundwater Quality Standards, background values, or two times the PQL, a significant change in groundwater quality is said to have occurred." Exh. 7-1 at 17.

- (a) Please explain how this provision in the permit might change if an adjusted standard were granted.

Response: *The City can only speculate as to how future permits may change. This is a subject we would like to discuss further with the IEPA.*

If the adjusted standards are approved, the definition of a significant change would require modification for parameters with the new standards. In the future, an exceedance above 51 ug/L for 1,4-dioxane and Class I Standards for ammonia, boron, sulfate, TOC, TOX and zinc would be considered a significant change in groundwater quality. Evaluation of 1,4-dioxane, ammonia, boron, sulfate, TOC, TOX, zinc, TDS, chloride, iron, manganese, pH and perchlorate based on PQLs and background would no longer be performed. The existing language of the permit would still apply to parameters not covered by the adjusted standards.

- (b) Under this permit provision, please explain what Collinsville would be required to do if "a significant change in groundwater quality" occurs.

Response: *Please see the response to Comment 31(a) above. A significant change would include the detection above Class I Standards or background values for compounds that are not associated with coal mining or post-landfill application of herbicides by the City. The organic compounds present in the leachate are well documented and are not associated with coal mining or recent herbicide applications. The City cannot speculate on events that have not occurred, but the City would address problems as they occur and would coordinate their response with input from the IEPA.*

32. The petition states that two creeks flow along the northern and western edges of the landfill and are sustained and recharged with groundwater. Pet. at 7. Surface water in the creeks along the landfill site perimeter exceeded surface water quality standards for iron and manganese. Iron and manganese standards were also exceeded upstream. Off-site locations did not exceed upstream concentrations or surface water quality standards. (Pet. Exh. 3 at 6.)

- (a) Please provide information regarding the concentrations of the exceedances found in the surface water samples from the site perimeter as well as the upstream exceedances and the downstream concentrations and sample locations.

Response: *The tables, figures and boring logs from the 2008 Groundwater Assessment Report are provided in Attachment 6. The extent figures for iron and manganese (Figures 11 and 13, respectively) show the locations and concentrations. Additionally, very early sampling results are provided in the 2000 Groundwater Assessment Plan (Attachment 16). The surface water samples collected in 1999 were sampled for chloride and TDS only and results did not exceed surface water criteria. The surface water exceedances during the 2006-2007 assessment monitoring period were the result of drought and high turbidity in the samples. Please see the response to Comment 32(b) below.*

- (b) Please clarify if the “off-site locations” that did not exceed surface water quality standards were immediately downstream of the Collinsville landfill.

Response: *Please see 2008 Figures 11 (iron) and 13 (manganese). The locations and concentrations for the surface water samples are provided on Figures 11-15 of Attachment 6. The 2006-2007 assessment monitoring surface water sample S-6 was the sole off-site location that was downstream of the landfill and the coal and gob.*

Except for the iron during one sampling event in 2007, no off-site downstream locations exceeded surface water criteria for the parameters of interest. The parameters that did not exceed surface water criteria included pH, phenols, barium, manganese and TDS.

The off-site iron exceedance includes S-6 (downstream sample) and S-7 (upstream sample) on one occasion only - the April 2007 sampling event. Both creeks were nearly dry in April 2007. After that date, both creeks were dry and were not sampled again (dry in during the August and October 2007 sampling events).

During the entire assessment monitoring period, the region was undergoing a severe drought. S-2 was dry and S-4 and MW-2 were nearly dry during November 2006. Samples collected from on-site sample S-4 in November 2006 and all locations in April 2007 were extremely turbid due to the limited water available in the creeks and do not reflect typical conditions. The April 2007 and November 2006 results for S-4 were not used in the extent figures because they were not representative of typical conditions at the site.

- (c) Please address the source of the exceedances for iron and manganese in the surface water and whether concentrations in the groundwater contribute to the exceedances.

Response: *The surface water exceedances are primarily the result of the drought and resultant turbidity of the creek samples in November 2006 and*

April 2007. There were few exceedances except during those two occasions when the creeks were nearly dry.

Additionally, the largest contributor to surface water in the western creek is the upstream surface water impoundments. Those impoundments are the headwaters for the western creek.

The presence of gob beneath the landfill may have contributed to the iron and manganese to a small degree but additional sources are located north of the creek. Historic mining activities took place both upstream and downstream of the site throughout the valley created by Canteen Creek along Lebanon Road. The presence of coal remnants on the north bank of Canteen Creek and old coal shafts on the hill north of the creek may represent an additional source of iron and manganese. Further downstream and west of the landfill, water seeping from the bottom of a very large restored (capped) abandoned gob pile is red and may contain high concentrations of iron and possibly manganese. The portion of the Canteen Creek watershed located adjacent to Lebanon Road is likely impacted by historic coal mining.

35 Ill. Adm. Code 104.406(k)

33. Exhibit 7-1 title page lists “Tables 7-1.1 and 7-1.2 Submitted to IEPA October 24, 2014”. Although Table 7-1.2 appears at the end of Exhibit 7, Table 7-1.1 was not included. Please submit Table 7-1.1 into the record or revise the Exhibit 7-1 title page.

***Response:** The table titled “Appendix A Table 4” that precedes Table 7-1.2 should have been labeled Table 7-1.1. The table has been revised and is provided in Attachment 16.*

34. Exhibit 7-1 states, “The statistical calculations sheets are presented in Appendix C and summarized in Appendix A, Table 4.” Exh. 7-1 at 16. Although Table 4 was provided, the statistical calculations sheets were not. Please provide the referenced statistical calculations sheets.

***Response:** Appendix C is provided as Attachment 18.*

35. Exh. 7-1 App. A Table 4 lists sampling results from “25-Jan-13”. Please clarify if the correct date should be November 25, 2013. See Exh. 3-1 at 11.

***Response:** The sample date of 25-Jan-13 should read 25-Nov-13. The typographical error has been corrected and is provided in Attachment 17.*

Written Responses to the BOARD QUESTIONS FOR CITY OF COLLINSVILLE

List of Attachments

- Attachment 1 Revised Proposed Adjusted Standards Table, Revised Exhibit 8, Excerpt from the Petition for Adjusted Standards for the Closed Collinsville Landfill, December 4, 2014
- Attachment 2 Revised Page iv and Pages 3-4, Exhibit 3, Excerpt from the Petition for Adjusted Standards for the Closed Collinsville Landfill, December 4, 2014.
- Attachment 3 Draft Limited Site Investigation and Recommendations for Development of a Leachate Management System for the Closed Collinsville Landfill, John Mathes & Associates, Inc., September 199.
- 3-1 Text, Tables and Figures, Draft Limited Site Investigation and Recommendations for Development of a Leachate Management System for the Closed Collinsville Landfill, John Mathes & Associates, Inc., September 1991
- 3-2 Plate 1
- 3-3 Plate 2
- 3-4 Plate 3
- 3-5 Plate 4
- Attachment 4 Vertical and Horizontal Extent of the Contaminants Associated with Pre- and Post-Landfill Activities, Closed Collinsville Landfill, Collinsville, IL
- Attachment 5 Legal Description of the Property, Closed Collinsville Landfill, Collinsville, IL
- Attachment 6 Assessment Monitoring Report Tables, Figures, and Boring Logs, Closed Collinsville Landfill, Collinsville, IL, Tetra Tech, January 2008
- Attachment 7 Revised Figures B1-B12, Exhibit 1-2, Excerpt from Petition for Adjusted Standards for the Closed Collinsville Landfill, December 4, 2014
- Attachment 8 Revised Figure 4-1, Exhibit 4-1, Excerpt from the Petition for Adjusted Standards for the Closed Collinsville Landfill, December 4, 2014
- Attachment 9 Revised Table 5-2.5, Exhibit 5-2, Excerpt from the Petition for Adjusted Standards for the Closed Collinsville Landfill, December 4, 2014
- Attachment 10 Revision 3, Appendix L, Background Statistics, Excerpt from the Assessment Monitoring Report, Closed Collinsville Landfill, Collinsville, IL, Tetra Tech, January 2008

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- Attachment 11 Laboratory Data Sheet and Field Data Log for MW-2, November 2006, Closed Collinsville Landfill, Collinsville, IL
- Attachment 12 Laboratory Data Sheet and Field Data Log for MW-4, February 2007, Closed Collinsville Landfill, Collinsville, IL
- Attachment 13 Collinsville City Limits in Relation to the Closed Collinsville Landfill, Collinsville, IL
- Attachment 14 Location of Water Wells within 2,500 feet of the Closed Collinsville Landfill, Collinsville, IL , Illinois State Geological Survey, July 31, 2015
- Attachment 15 Groundwater Assessment Plan, Closed Collinsville Landfill, Collinsville, IL, Tetra Tech, January 2000
- 15-1 Text and Tables, Groundwater Assessment Plan, Closed Collinsville Landfill, Collinsville, IL, Tetra Tech, January 2000
- 15-2 Plate 1
- Attachment 16 Revised Table Appendix A Table 4, Exhibit 7-1, Excerpt from Petition for Adjusted Standards for the Closed Collinsville Landfill, December 4, 2014
- Attachment 17 Appendix C, Establishment of Background Values for Perchlorate, 1,4-Dioxane, and Mecoprop for the Closed Collinsville Landfill, Collinsville, IL, Tetra Tech, October 2014