BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: PETITION OF CATERPILLAR INC. FOR AN ADJUSTED STANDARD FROM 35 ILL. ADMIN. CODE 620.410(a) AND 817.106(a)	AS 13 - _____ (Adjusted Standard)

NOTICE OF FILING

To:

Office of the Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, Illinois 60601-3218

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield IL 62794-9276

PLEASE TAKE NOTICE that we have today filed electronically with the Office of the Clerk of the Pollution Control Board, the following documents on behalf of Caterpillar Inc.:

1. Motion for Expedited Review;
2. Entry of Appearance for John W. Watson and Daniel R. De Deo; and
3. Petition of Caterpillar Inc. for an Adjusted Standard from 35 Ill. Admin. Code 620.410(a) and 817.106(a).

Caterpillar Inc.

By:_____
Its Attorneys, Baker & McKenzie LLP

Dated: June 27, 2013

John W. Watson
Daniel R. De Deo
Baker & McKenzie LLP
300 East Randolph Street
Suite 5000
Chicago, Illinois 60601
312-861-2646

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Notice of Filing of Caterpillar Inc. for a Petition for an Adjusted Standard from 35 Ill. Admin. Code 620.410(a) and 817.106(a), upon the following persons on the 27th day of June, 2013:

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
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Springfield IL 62794-9276

Illinois Pollution Control Board, Attn: Clerk
James R. Thompson Center
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MOTION FOR EXPEDITED REVIEW

Petitioner, Caterpillar Inc. ("Caterpillar"), by its attorneys, Baker & McKenzie LLP, hereby moves the Illinois Pollution Control Board (the "Board") for expedited review of its Petition for an Adjusted Standard in the above-captioned matter. In support of this motion, Caterpillar states as follows:

1. The Illinois Environmental Protection Agency ("IEPA") has granted Caterpillar temporary relief from the specific requirements under its landfill operating permit (Permit No. 1995-154-LFM) that form the basis of the above-captioned Petition for an Adjusted Standard.

2. The temporary relief granted by IEPA under Permit No. 1995-154-LFM will expire at the end of 2013.

3. Caterpillar would like to resolve this compliance concern as quickly as possible and in advance of the expiration of its current permit-based relief.

WHEREFORE, Caterpillar requests that the Board enter an order approving this motion and allowing expedited review of Caterpillar's Petition for an Adjusted Standard in this matter.

Dated: June 27, 2013

Baker & McKenzie LLP

John W. Watson
Daniel R. De Deo
Baker & McKenzie LLP
300 East Randolph Street
Suite 5000
Chicago, Illinois 60601
312-861-2646

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Motion for Expedited Review of Caterpillar Inc. for its Petition for an Adjusted Standard from 35 Ill. Admin. Code 620.410(a) and 817.106(a), upon the following persons on the 27th day of June, 2013:

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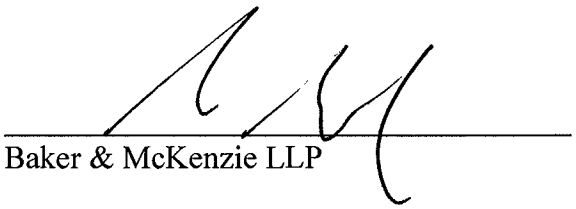

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: PETITION OF CATERPILLAR INC. FOR AN ADJUSTED STANDARD FROM 35 ILL. ADMIN. CODE 620.410(a) AND 817.106(a)	AS 13 - _____ (Adjusted Standard)

ENTRY OF APPEARANCE

The undersigned hereby enter their Appearance in this proceeding on behalf of Petitioner, Caterpillar Inc.

Respectfully submitted,

Dated: June 27, 2013

John W. Watson
Daniel R. De Deo

John W. Watson
Daniel R. De Deo
Baker & McKenzie LLP
300 East Randolph Street
Suite 5000
Chicago, Illinois 60601
312-861-2646

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Entry of Appearance on behalf of Caterpillar Inc. for its Petition for an Adjusted Standard from 35 Ill. Admin. Code 620.410(a) and 817.106(a), upon the following persons on the 27th day of June, 2013:

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: PETITION OF CATERPILLAR INC. FOR AN ADJUSTED STANDARD FROM 35 ILL. ADMIN. CODE 620.410(a) AND 817.106(a)	AS 13 - _____ (Adjusted Standard)

PETITION OF CATERPILLAR INC.

Petitioner, Caterpillar Inc. ("Caterpillar"), by its attorneys, Baker & McKenzie LLP, hereby petitions the Illinois Pollution Control Board (the "Board") for an order granting Caterpillar an adjusted standard from the Class I groundwater quality standard for Total Dissolved Solids ("TDS") at 35 Ill. Admin. Code 620.410(a). Caterpillar seeks this regulatory relief for the on-site potentially usable waste landfill ("Mapleton Landfill" or the "Landfill") that receives foundry waste from the adjacent foundry ("Mapleton Plant" or the "Plant"), located in Mapleton, Peoria County, Illinois.

This relief is necessary and appropriate given the ongoing challenges Caterpillar is experiencing with TDS concentrations in the Landfill leachate and the corresponding absence of environmental impacts resulting from these elevated TDS concentrations. If Caterpillar is granted the proposed adjusted groundwater standard, the maximum allowable leachate concentration ("MALC") for TDS could be adjusted from the value provided at 35 Ill. Admin. Code 817.106(a) to a new MALC that would take into consideration background conditions and the unique circumstances confronted at the Mapleton Landfill. Caterpillar is requesting the proposed adjusted standard pursuant to Section 28.1 of the Illinois Environmental Protection Act, 415 ILCS 5/28.1, and the Board's regulations at 35 Ill. Admin. Code 104.400 *et seq.*

In support of its Petition, Caterpillar states as follows:

I.

BACKGROUND

The Board has long recognized the importance of adjusted standards to address instances where site-specific conditions make compliance with the rules of general applicability technically infeasible, cost-prohibitive, or otherwise suffering from both maladies. The instant Petition seeks to remedy a long-standing and uniquely site-specific regulatory challenge confronted by Caterpillar in its ongoing efforts to comply with the requirements of the Board's "Requirements for New Steel and Foundry Industry Wastes Landfills" regulations (hereinafter "Part 817") at its Mapleton Landfill. 35 Ill. Admin. Code Part 817.

The Board promulgated the Part 817 regulations in 1994 in a rulemaking proceeding initiated by the Illinois steel and foundry industry trade groups. *In re Steel and Foundry Industry Amendments to the Landfill Regulations (Parts 810 through 815 and 817)*, Case No. R1990-026(A) (hereinafter "R90-26"). The intent of Part 817 was to develop less stringent design and operating standards for new landfills accepting low-toxicity, high-volume waste streams from the steel and foundry industries, including the waste generated at the Mapleton Plant and disposed in the on-site Mapleton Landfill. *See* R90-26, Opinion and Order of the Board, at 2, July 21, 1994; Petitioners' Joint Proposal of Rulemaking, Statement of Reasons, at 2-3, Dec. 3, 1990. At the time of passage of the Part 817 regulations, the Mapleton Landfill had been in operation for almost two decades and was the only foundry landfill in the State of Illinois managing wastes subject to regulation under the new Part 817 requirements.

Caterpillar's efforts to conform its Mapleton Landfill operations to an entirely new regulatory regime premised, at least in part, on important facility siting considerations for new landfills, have not been without considerable difficulty. This Petition seeks to remedy the long-term struggle with the Part 817 MALC leachate limits for TDS in connection with Caterpillar's

Mapleton Plant operations. Individual leachate samples have consistently exceeded the MALC for TDS since leachate monitoring was initiated at the Landfill in 1997. Nevertheless, Caterpillar historically has remained in compliance with the MALC for TDS based on the fact that its Permit relies on a rolling average of sampling events to determine MALC compliance. In the last few years, however, Caterpillar has begun to experience consistent exceedances of the MALC for TDS, thus necessitating this Petition for an adjusted standard to resolve this compliance challenge.

Caterpillar's requested relief is uniquely site-specific and narrow. As was true in 1994 at the time of promulgation of Part 817, the Mapleton Landfill remains the only active Part 817 foundry waste landfill operated in the State of Illinois today. Furthermore, the elevated TDS concentrations in groundwater in the vicinity of the Mapleton Landfill create compliance challenges only at this operating facility and would clearly be avoided by any new landfill operator seeking to site and permit a new steel and foundry industry waste landfill as contemplated under the Part 817 regulations. Finally, Caterpillar also is not seeking authorization to landfill different wastes other than those authorized by the Permit or to change the status of the Landfill to a different category of foundry waste landfill. The relief requested is limited solely to changing the TDS MALC applicable to leachate.

As set forth more fully in this Petition, Caterpillar can establish that its request for an adjusted standard satisfies each of the applicable regulatory criteria and will not impair or otherwise deleteriously impact water quality in the State of Illinois or otherwise create risks to human health or the environment. Further, Caterpillar lacks any viable alternatives to address TDS concentrations in the Landfill leachate, and its only reasonable option is to be permitted to

use an adjusted MALC for TDS. Accordingly, the requested relief from the Board is justified and appropriate.

A. Mapleton Landfill

The Mapleton Landfill is located on-site at the Mapleton Plant, situated adjacent to the Illinois River. The Landfill is a "potentially usable waste" foundry waste landfill subject to Part 817 and operates pursuant to Permit No. 1995-154-LFM, issued by the Illinois Environmental Protection Agency ("IEPA") and most recently modified on March 11, 2013 (the "Permit"). The Permit is attached to the Petition as Exhibit 1. The Landfill receives potentially usable spent foundry wastes from the foundry operations at the Plant. (Permit at 6.) Although subject to Part 817 requirements, the Mapleton Landfill has been in operation since 1977 and existed prior to promulgation of Part 817. The Mapleton Landfill is a unique landfill in the state of Illinois. To our knowledge, it was one of the only landfills of its kind in existence in Illinois at the time that Part 817 was promulgated, and today remains one of if not the only active landfill in Illinois permitted under Part 817 as a foundry waste landfill.

Pursuant to the Permit and the regulatory requirements of Part 817 for potentially usable waste landfills, Caterpillar is required to monitor leachate at the Landfill semi-annually to confirm compliance with the MALCs at Section 817.106(a). (Permit at 11.) Failure to meet the MALC for any constituent would ultimately result in a requirement that the Landfill is subject to and must comply with the requirements for a low risk waste landfill under Part 817. (*Id.* at 13.) The requirements for a low risk waste landfill include liner and leachate collection design elements that are not required for and are not currently in place at the Mapleton Landfill. 35 Ill. Admin. Code 817.401 *et seq.*

While the Permit-derived exceedances of the MALC for TDS are a relatively recent occurrence, since monitoring commenced in 1997 under Part 817, leachate TDS results for the

Mapleton Landfill have consistently included individual sample results above the MALC limit of 1,200 mg/L. (CRA Report at 12-13, Figure 2.11.) These individual sample results did not result in actual exceedances of the MALC because the determination of compliance with the TDS MALC limit under the Permit is based on a statistical analysis of the rolling average of the last four sampling events. (Permit at 10.) Starting in October 2009, however, the statistical analysis of the leachate analytical results showed that the leachate exceeded the MALC of 1,200 mg/L for TDS. (CRA Report at 13.) Thus, the ongoing issue with TDS levels in leachate has now materialized into a regulatory concern under the Permit. IEPA temporarily addressed this issue with the approval of Permit modifications, the most recent of which was issued by the Agency on March 11, 2013 and provides that the Permit requirements regarding the MALC for TDS in the leachate do not apply for the second and fourth quarters of 2013. IEPA provided this temporary relief to allow Caterpillar the opportunity to analyze the issue and determine what steps were necessary to achieve compliance with the MALC, including potential relief from the Board as requested in this Petition.

In response to this growing compliance concern and IEPA's Permit modifications, Caterpillar completed a hydrogeological investigation at the Mapleton Landfill to better define background groundwater quality with respect to TDS and understand the potential source and causes of high TDS detections dating back to the initiation of leachate sampling in 1997, and as experienced more acutely in recent sampling events. The hydrogeological investigation was completed by Conestoga-Rovers & Associates ("CRA") and is discussed further below in Part I.C. CRA's hydrogeological investigation is incorporated by reference into the Petition and is attached to the Petition as Exhibit 2. The investigation focused on sampling from leachate and groundwater wells to evaluate the extent of impacts from the Landfill leachate to groundwater

and to estimate the background concentrations of TDS in groundwater upgradient of the Landfill. (CRA Report at 17-22.) The hydrogeological investigation also included sampling from lysimeters installed within the Landfill, which produce samples of leachate as it percolates through the Landfill before it is influenced by and commingled with groundwater. (*Id.* at 20-22, 34.)

As explained more fully below, based on four quarters of sampling data, the hydrogeological investigation confirms that TDS is present at concentrations exceeding the MALC in the upgradient background groundwater, which is unaffected by the Landfill. (*Id.* at 50-51.) The statistical evaluation of the data has also confirmed that the Landfill is not impacting downgradient groundwater above the TDS concentration range observed in the upgradient groundwater. (*Id.* at 51-52.)

Caterpillar, through this Petition, is now requesting an adjusted standard from the Board to address the compliance challenges in meeting the MALC for TDS in Landfill leachate as required by Part 817 and the Permit.

B. Overview of Part 817 regulations for Steel and Foundry Industry Wastes Landfills

As the Board considers Caterpillar's Petition, the unique nature of the Mapleton Landfill is best understood in the context of the development of and the purposes underlying Part 817. In December of 1990, the Illinois Steel Group and the Illinois Cast Metals Association initiated a rulemaking before the Board that ultimately resulted in the 1994 promulgation of Part 817, an entirely new set of regulations that apply specifically to waste landfills that receive wastes from the steel and foundry industry. *See* R90-26 Rulemaking Proceeding; 35 Ill. Admin. Code Part 817. The Board promulgated the regulations at Part 817 to address disposal of certain wastes from the steel and foundry industries, taking into consideration the inert nature of steel and foundry waste streams and the possibility that such wastes may have alternate uses. R90-26,

Opinion and Order of the Board, at 2, July 21, 1994; R90-26, Petitioners' Joint Proposal of Rulemaking, Statement of Reasons, at 2-3, Dec. 3, 1990. Part 817 provides less stringent disposal standards for the high-volume and low-risk wastes produced by the steel and foundry industries. R90-26, Opinion and Order of the Board, at 2, July 21, 1994; R90-26, Petitioners' Joint Proposal of Rulemaking, Statement of Reasons, at 2-3, Dec. 3, 1990. Three categories of wastes are regulated by Part 817 – beneficially usable wastes, potentially usable wastes, and low risk wastes. 35 Ill. Admin. Code Part 817. As noted above, the Mapleton Landfill is classified as a potentially usable waste foundry waste landfill. (Permit at 6.)

While the rulemaking proceeding for Part 817 was a long and rigorous process that spanned three and a half years, the development of the MALC for TDS was not subject to any significant analysis or based on a detailed technical justification. Rather, the Part 817 MALC limit for TDS was derived directly from the Part 620 groundwater quality standard for TDS (1,200 mg/L) for Class I groundwater. (R90-26, Opinion and Order of the Board at 18, July 21, 1994). As discussed in this Petition, the default TDS MALC established in Part 817 is ill-suited for application to the Mapleton Landfill and justifies the site specific relief requested by Caterpillar.

C. Summary of Hydrogeological Investigation

Caterpillar retained CRA to assist in evaluating TDS concentrations in leachate and groundwater and developing a solution to address the unintended, yet unavoidable, regulatory challenge confronted at Mapleton – Landfill leachate with periodic compliance issues under the TDS MALC limit combined with the possible influence of existing groundwater with established TDS concentrations above the MALC. In proceeding with its hydrogeological investigation described more fully herein and attached at Exhibit 2, CRA followed well-established scientific processes for assessing landfill impacts where high background concentrations are suspected to

be present in groundwater and focused on an analysis of TDS levels in leachate and groundwater. The investigation included sampling from 5 leachate wells, 5 lysimeters, and a network of groundwater wells (11 shallow and 6 deep). (CRA Report at 17-22.) The lysimeters were installed within the footprint of the Landfill and used as an additional reference point for the assessment of leachate percolating through the Landfill. (*Id.* at 20-21.)

TDS concentrations ranged from 319 mg/L to 3,050 mg/L in the groundwater. (*Id.* at 26-27, Tables 4.2 and 4.3.) TDS concentrations ranged from non-detect to 2,200 mg/L in the leachate well samples. (*Id.* at 27-28, Table 4.4.) TDS concentrations were generally lowest in the lysimeter data, with only the samples from one of the lysimeters exceeding the MALC and results ranging from 730 mg/L to 1,500 mg/L. (*Id.* at 28, Table 4.5.)

CRA also used the upgradient groundwater sampling results to develop a statistical representation of background TDS concentrations in groundwater in order to determine an appropriate value that could be proposed as an alternative to the current MALC for TDS. (*Id.* at 36-37.) Calculation of this number, the Background Threshold Value ("BTV"), is a widely accepted approach to evaluating background environmental conditions and was carried out using U.S. EPA's ProUCL (Version 4.1) software. (*Id.* at 31-32.) The BTV provides the value at which 95% of samples would be expected to show results below that value. (*Id.* at 30-32, 36-37.) In this situation, the upgradient TDS data set was used to develop a BTV for background TDS levels in groundwater uninfluenced by the Landfill, and the resulting BTV for TDS in upgradient groundwater is 2,539 mg/L. (*Id.* at 36-37.)

Based on CRA's analytical and statistical evaluation of the data, several conclusions are worth noting in relation to Caterpillar's proposed adjusted standard:

- Background TDS levels in upgradient groundwater – that is, groundwater moving laterally by advection from upgradient areas to north of the Landfill into the water-bearing units beneath and downgradient of the Landfill – exceed the MALC for TDS. (*Id.* at 36-37, 39, 50-51.)
- The TDS concentrations in shallow groundwater immediately downgradient of the Landfill, where Landfill-related TDS effects would be expected to be most prevalent, are similar to the background concentrations in upgradient groundwater. Therefore, any potential Landfill-related TDS impacts to the shallow downgradient groundwater are negligible. (*Id.* at 37-40, 51-52.)
- The BTV for TDS in upgradient groundwater is 2,539 mg/L and is a useful statistical representation of background TDS concentrations in groundwater upgradient of the Landfill. (*Id.* at 36-37.) The BTV provides an appropriate alternative compliance benchmark to the current MALC, given that background TDS concentrations exceed the TDS MALC of 1,200 mg/L. (*Id.* at 36-37, 39-40, 51.)

CRA also evaluated potential impacts to the environment under the proposed adjusted standard and concluded that the Board's granting of the requested relief would not result in substantial or significant effects on or impacts to the Illinois River or any potential environmental receptors due to the lack of any significant loadings from the Landfill to the Illinois River. (*Id.* at 42-46, 52-53.)

II.

APPLICABLE LEGAL STANDARDS

Although Caterpillar is requesting an adjusted standard from the groundwater quality standard for TDS in Section 620.410(a), the genesis of the requested relief is Part 817.

Caterpillar is seeking regulatory relief because, as described above, TDS concentrations in the Landfill leachate have been found to be consistently above the MALC for TDS established by Section 817.106(a). Section 817.106(b) provides a mechanism for an operator of a Part 817 landfill to exceed a secondary MALC standard, such as TDS, by showing that the increase will not result in an exceedance of the groundwater quality standards in Section 817.416. The groundwater quality standard applicable to TDS at the Mapleton Landfill, per Section 817.416(a)(1)(A), is the Board-established standard of 1,200 mg/L for Class I groundwater pursuant to 35 Ill. Admin. Code 620.410(a). In the case of TDS, then, because the background concentrations of TDS in groundwater upgradient of the Landfill exceed the MALC, it is impossible to satisfy Section 817.106(a), *i.e.*, it is impossible to show that an increase above the MALC will not result in an exceedance of the groundwater quality standard beyond the limits of the zone of attenuation because the groundwater contains naturally occurring TDS that exceeds the standards of 35 Ill. Admin. Code Part 620. Therefore, Caterpillar cannot meet the requirements of Section 817.416 without an adjusted groundwater quality standard. Section 817.416 specifically contemplates that the applicable groundwater standard may be in the form of an adjusted standard pursuant to Section 817.416(b). Thus, before Caterpillar can avail itself of the mechanism in Section 817.106(b) for exceeding a secondary MALC standard, Caterpillar must seek an adjusted standard for TDS under 817.416(b).

Section 817.416(b) allows a Part 817 landfill operator to petition for an adjusted groundwater standard pursuant to Section 28.1 of the Illinois Environmental Protection Act, 735 ILCS 5/28.1, and the Board regulations governing adjusted standards at 35 Ill. Admin. Code 104.400 *et seq.* If the justification for the adjusted standard is that the groundwater contains naturally occurring constituents that exceed the standards of 35 Ill. Admin. Code Part 620, then

the Board can grant an adjusted standard based on the justification factors at Section 817.416(b)(2). In the absence of this justification, the general adjusted standard justification at Section 104.426(a) applies. In this Petition, Caterpillar has conclusively established that justification exists to support the Board's granting of the proposed adjusted standard both under the Section 817.416(b)(2) criteria, based on background levels of TDS at the Mapleton Landfill, and under the general adjusted standard criteria, based on the unique circumstances at the Landfill and the lack of environmental harm presented by elevated TDS concentrations.

Section 817.106(b) also requires that the operator use the groundwater impact assessment procedures of Section 817.413 to demonstrate that the MALC increase will not result in an exceedance of the groundwater standard beyond the zone of attenuation, which in this case would be the adjusted groundwater quality standard that Caterpillar is seeking. Under the groundwater impact assessment procedures at Section 817.413, the calculated MALC values are compared to the leachate values for the waste streams to determine whether compliance with the groundwater standards can be met. 35 Ill. Admin. Code 817.413(a)(3)(F). The calculated MALC values used for this comparison are determined based on the values required to achieve compliance with the applicable groundwater quality standard. 35 Ill. Admin. Code 817.413(a)(3)(E). The groundwater impact assessment is acceptable if the leachate values are less than the calculated MALC values. 35 Ill. Admin. Code 817.413(b). Caterpillar is seeking the proposed adjusted groundwater standard, which has been calculated based on the leachate sampling data from the hydrogeological investigation, so that a MALC value for TDS can be calculated pursuant to Section 817.413 that will comply with the adjusted groundwater quality standard.

III.

DISCUSSION

Caterpillar has conducted a careful evaluation of the Landfill leachate and groundwater quality with respect to TDS concentrations in order to determine its options for addressing compliance challenges with the TDS MALC limit in the Permit. As demonstrated below, as a legal and technical matter, Caterpillar has established the necessary elements to warrant an adjusted groundwater standard based on the unique characteristics of the Mapleton Landfill, the high levels of TDS in background, the absence of impacts from the Landfill leachate to groundwater quality with respect to TDS, and the lack of viable alternatives for ensuring compliance with the current TDS MALC limit. Pursuant to the legal standards in Part 817 and the Board regulations at 35 Ill. Admin. Code 104.400 *et seq.* allowing for adjusted standards, the Board can and should grant the proposed adjusted standard.

A. Standard from which the proposed adjusted standard is sought. – Section 104.406(a)

The regulation of general applicability from which Caterpillar is seeking an adjusted standard is 35 Ill. Admin. Code 620.410(a) (first effective November 25, 1991; last amendment effective Oct. 5, 2012), and, by extension, the applicability of that regulation to Section 817.106(a) (effective Aug. 1, 1994), which provides standards for leachate from a potentially usable waste landfill. More specifically, Caterpillar is seeking an adjusted standard from the Class I groundwater quality standard of 1,200 mg/L for TDS, which would consequently allow leachate from the Mapleton Landfill to exceed the 1,200 mg/L MALC for TDS.

B. Statute implemented by regulation of general applicability. – Section 104.406(b)

The relevant regulation from which an adjusted standard is sought, Section 620.410, was promulgated pursuant to the Illinois Groundwater Protection Act, 415 ILCS 55/8. In addition, the regulations at Part 817 that are relevant to the proposed adjusted standard were promulgated

pursuant to the Illinois Environmental Protection Act, 415 ILCS 5/1 *et seq.* Section 620.410 and Part 817 were not promulgated to implement any of the federal statutes listed in Section 104.406(b).

C. Level of justification; other requirements. – Section 104.406(c)

1. Level of justification for adjusted standard. – Section 817.416(b)(2) and Section 104.426(a)

As explained in Part II, Section 817.416(b) is the relevant provision when an adjusted groundwater quality standard is needed for a Part 817 landfill. Pursuant to that provision, if the justification for the adjusted standard is that the groundwater contains naturally occurring constituents that exceed the standards of 35 Ill. Admin. Code Part 620, then the Board can grant an adjusted standard based on the following justification factors found at Section 817.416(b)(2):

A) The groundwater does not presently serve as a source of drinking water;

B) The change in standards will not interfere with, or become injurious to, any present or potential beneficial uses for such waters;

C) The change in standards is necessary for economic or social development, by providing information including, but not limited to, the impacts of the standards on the regional economy, social disbenefits such as loss of jobs or closing of landfills, and economic analysis contrasting the health and environmental benefits with costs likely to be incurred in meeting the standards; and

D) The groundwater cannot presently, and will not in the future, serve as a source of drinking water because:

i) It is impossible to remove water in usable quantities;

ii) The groundwater is situated at a depth or location such that recovery of water for drinking purposes is not technologically feasible or economically reasonable;

iii) The groundwater is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption;

iv) The total dissolved solids content of the groundwater is more than 3,000 mg/l and the water will not be used to serve a public water supply system; or

v) The total dissolved solids content of the groundwater exceeds 10,000 mg/l.

In the absence of this justification, the general adjusted standard justification at Section 104.426(a) applies:

1) Factors relating to the petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to the petitioner;

2) The existence of those factors justifies an adjusted standard;

3) The requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and

4) The adjusted standard is consistent with any applicable federal law.

In this Petition, Caterpillar has provided justification under both the Section 817.416(b)(2) criteria based on background levels of TDS at the Mapleton Landfill and the general adjusted standard criteria at Section 104.426(a) based on the compliance challenges with

respect to leachate TDS levels. The justification criteria are discussed in detail in Part III.H.1 and 2.

2. Groundwater Impact Assessment. – Section 817.413

Caterpillar's ultimate objective in seeking an adjusted groundwater quality standard is to obtain an adjusted MALC for TDS at the Mapleton Landfill. Accordingly, although not directly relevant to the adjusted standard criteria, this Petition also addresses the provisions necessary for Caterpillar to obtain an adjusted MALC. Section 817.106(b) provides the mechanism to allow exceedance of the MALC; it requires that the operator use the groundwater impact assessment procedures of Section 817.413 to demonstrate that the MALC increase will not result in an exceedance of the groundwater standard.

The groundwater impact assessment procedures require that the amount of seepage from the unit is estimated based on the assumptions of Section 817.413(a)(1) regarding design standards and that the concentrations of constituents are determined from actual leachate samples from the waste or similar waste or from laboratory-derived extracts. 35 Ill. Admin. Code Section 817.413(a)(1) and (2). The criteria for the groundwater impact assessment serve to "estimate the capability of the geology and hydrology beneath the unit to meet the groundwater quality standards of Section 817.416 at the edge of the zone of attenuation." 35 Ill. Admin. Code Section 817.413(a)(3). The specific criteria are:

A) Determine the aquifer conductivity and gradient using the hydrogeologic information collected pursuant Section 817.411. If the aquifer conductivity is $1x10(^{-5})$ cm/sec or less, no further groundwater impact assessment is required.

B) Develop a conceptual groundwater flow model of the site to determine the soil units through which leachate constituents may migrate.

C) Determine the organic carbon content for soil units through which the leachate constituents may migrate.

D) Determine the retardation factor for constituents of interest based on traditional hydrogeological methods.

E) Determine MALC values for constituents of interest required to achieve compliance with the applicable groundwater quality standards specified at Section 817.416.

F) Compare the calculated MALC values to the leachate values for the expected waste streams to determine whether compliance with groundwater standards can be met.

After completing the above steps, "[t]he groundwater impact shall be considered acceptable if the leachate values for the expected waste streams are less than the MALC values calculated in accordance with subsection 817.413(a)(3)(F)." Because Caterpillar is seeking an adjusted groundwater quality standard, the evaluation under the groundwater impact assessment procedures is based on the groundwater quality standard as modified by Caterpillar's proposed adjusted standard. The groundwater impact assessment is discussed in detail in Part III.H.3.

D. <u>Nature of Caterpillar's activity at Mapleton facility. – Section 104.406(d)</u>

The Mapleton Plant is located at 8826 West Route 24, Mapleton, Peoria County, Illinois and is situated on a 350-acre property north of and adjacent to the Illinois River and immediately south of the Village of Mapleton. The Mapleton Plant has been in operation since 1967 and currently employs approximately 567 salaried and hourly employees. Current foundry operations are conducted in Building D, which is located west of Little LaMarsh Creek and north of the Toledo, Peoria, and Western ("TP&W") Railroad rail easement. Caterpillar originally conducted foundry operations in Building B, which was located on the northeastern portion of

the site, east of Little LaMarsh Creek. Operations in Building B ceased in the late 1980s and the building was demolished in 2008-2009.

The Plant produces gray iron and ductile iron castings for use in production at some of Caterpillar's other facilities. Most of the castings produced are for engine or heavy equipment manufacture. Products manufactured at the Plant include engine blocks, cylinder heads, liners, and housings. Two processes are used at the Plant to produce castings – a green sand process and a chemically bonded sand process. The green sand is composed mostly of silica sand (85-95%), with additional components of 4-10% bentonite clay, 2-10% carbonaceous material, and 2-5% water. A variety of resins are used for bonding in the chemically bonded sand process, including furan resin, urethane cold box resin, urethane air set resin, urethane hot box resin, and epoxy cold box resin. The type of resin used depends on the desired physical characteristics of the product, what type of production equipment is available, and the economics of production.

The Mapleton Landfill is located on-site at the Mapleton Plant in an area south of the TP&W rail easement, east of Little LaMarsh Creek, and north of the Illinois River, above the 100-year floodplain. It has a footprint of approximately 80 acres. The Landfill was constructed in 1977 and has been permitted by IEPA since commencement of initial operations. The current Permit, which allows the Landfill to operate as a potentially usable waste landfill under Part 817, was first issued in 1995. The Landfill does not have a liner but was originally constructed over a clay layer. The sides of the Landfill are sloped berms composed of compacted foundry sand. Surface drainage from the landfill is directed to six sedimentation ponds, three on the north side and three on the south side. The sedimentation ponds discharge through outfalls to the Illinois River as authorized under the NPDES permit for the Mapleton Plant.

Material is added to the Landfill by truck and compacted as needed with tractors. The Landfill primarily receives spent foundry sands – both the green sand and the chemically bonded core sand – from the foundry casting production process, as well as varying amounts of other foundry wastes, including finishing waste (foundry sand mixed with metallics and metal pieces), metallics waste (steel shot, metal fines), metal pieces mixed with sand (less than 1%), foundry slag, dust collector wastewater treatment sludge, full dry dust collector super sacks, and used furnace refractory. (Permit at 6.) Caterpillar estimates that the Landfill is currently at 50% of the permitted capacity. Historically, the Landfill received an estimated 150,000 to 250,000 tons of foundry sand per year. Since 2009, the annual contribution has dropped to less than 130,000 tons per year. Although the amount of material contributed has varied from year to year, the composition of the waste stream has not changed.

The land surrounding the Mapleton Plant includes a mixture of industrial use, agricultural use, and open space. To the east of the Plant and extending for two miles, upstream along the Illinois River, land use is industrial, agricultural, and, bordering the Illinois River, flood plain and wetlands. Land use on adjacent property to the west is open space or agricultural use. North of the Plant, land use is primarily sparse residential, agricultural, and open space, and much of the land immediately north of the Plant is wooded. South of the Plant, on the opposite side of the Illinois River, land use is primarily agricultural and some sparse residential use. Powerton Lake, a large cooling water reservoir serving the Powerton electrical generating plant, is located southeast of the Plant and on the opposite side of the Illinois River. There are no major population centers within a three-mile radius of the Plant.

E. <u>Analysis of compliance alternatives. – Section 104.406(e)</u>

If Caterpillar were required to comply with the regulation of general applicability rather than the proposed adjusted standard, it would have to pursue one of only a few available

compliance alternatives. As discussed below, each of these options would be cost-prohibitive, disruptive, impractical, and infeasible when considered in comparison to conducting operations under the proposed adjusted standard.

One possible alternative would be to collect the leachate from the Landfill, treat the leachate, and discharge the leachate under the Plant's NPDES permit, which would need to be amended to include the discharge of treated leachate. A detailed discussion of this alternative is provided in CRA's memorandum, "Basis and Cost Estimate for Conceptual Landfill Leachate Treatment System," attached to the Petition as Exhibit 3 (hereinafter "Leachate Memo"). This alternative would require significant infrastructure to collect and treat leachate, including construction and installation of leachate extraction wells, various conveyance systems, and a leachate storage reservoir. (*Id.* at 2, 5.) After collection, the leachate would need to be treated prior to discharge using one of two different treatment approaches: (1) reverse osmosis ("RO"), or (2) chemical precipitation. (Leachate Memo at 3.) The RO-based treatment process would include clarifiers and pressure filtration for pretreatment, a pH adjustment step, a reverse osmosis treatment system to remove dissolved ions, and dewatering and evaporation equipment to reduce the volume of the reverse osmosis concentrate stream. (*Id.* at 3-4.) The chemical precipitation treatment process would involve a dual-stage precipitation process using lime to remove metals and fluoride. (*Id.* at 4.) The chemical precipitation approach would cost less that the RO-based approach, but the RO-based system might be the required approach, depending on the outcome of amending the NPDES permit to include discharge of treated leachate. (*Id.* at 3-5.)

This alternative – collecting and treating leachate – would be very costly and, further, would result in treatment of groundwater in addition to leachate. The leachate collection system would be designed to establish an inward hydraulic gradient beneath the Landfill, which would

unavoidably result in the extraction of both groundwater and leachate from beneath the Landfill. (*Id.* at 2.) This mixture of leachate and groundwater would be conveyed to the treatment system prior to discharge to the Illinois River; therefore, in addition to Landfill leachate, the system would also extract groundwater and treat naturally occurring constituents in groundwater. (*Id.*) The construction of infrastructure to collect, convey, treat, and discharge the leachate would require an initial estimated capital expenditure in excess of $11 million for the RO-based treatment system or $6.8 million for the chemical precipitation treatment system. (*Id.* at 4-5, Tables 2 and 3.) Thereafter the system would demand annual operating costs of $680,000 for the RO-based system or $580,000 for the chemical precipitation system. (*Id.* at 5, Tables 4 and 5.)

A second alternative would involve compliance with the requirements triggered for a potentially usable waste landfill that cannot meet the MALCs. In such a scenario, the landfill is required to comply immediately with the low risk waste landfill requirements. For the Mapleton Landfill, this would include retrofitting the Landfill to incorporate a liner, leachate collection system, and other design elements, many of which would be exceedingly difficult, disruptive, and costly to retrofit to an existing landfill such as the Mapleton Landfill. For example, there is no engineered clay liner beneath the Landfill and there is no practical way to retrofit such a liner. Such an operation would require excavating and staging approximately 4,000,000 cubic yards of waste to install a liner, and then returning the waste to the Landfill. Additionally, leachate collection and treatment for TDS similar to that described previously would need to be installed and operated. Another potential option is excavation and disposal of the contents of the Landfill at an off-site disposal facility. In addition to the lack of availability of an off-site disposal facility within a reasonable radius that could accept the waste, this approach would require transport of some 200,000 truckloads of waste, which would likely require a decade or more to

complete and multiple tens of millions of dollars to implement. Obviously, these resources simply are not reasonably available.

Ceasing use of the Landfill would seemingly be a third, and likely final, alternative. In order to continue the operations at the Mapleton Plant, Caterpillar would then have to ship its foundry wastes off-site for disposal, at an annual cost of approximately $8 million. Under this alternative, Caterpillar would also be required to pursue closure of the Landfill, which would likely include further consideration of the status of the Landfill under Part 817. This could potentially require that Caterpillar meet the provisions applicable to a low-risk waste landfill, which as discussed above would require a liner and retrofit of a leachate collection system. Excavation and off-site disposal of the entire contents of the Landfill as described in the previous paragraph would be the alternative to compliance with the low-risk waste landfill requirements. In sum, closure of the Landfill could result in exceedingly high future disposal costs for the Mapleton Plant and still require the resolution of issues around the regulatory status of the Landfill under Part 817.

Caterpillar has determined that all of these compliance alternatives are cost-prohibitive and exceedingly difficult to implement and would threaten the current profitability of the Mapleton Plant's operations if imposed on Caterpillar. The economic and social impacts to the region could be significant and are discussed further in H.1.c.

F. Proposed Adjusted Standard. – Section 104.406(f)

Caterpillar requests that the Board grant the following relief and make the following findings:

1. **Caterpillar is granted an adjusted standard from the Class I Groundwater Quality Standard for TDS at 35 Ill. Admin. Code 620.410. In lieu of the standard in 35 Ill. Admin. Code 620.410 applicable to TDS, the groundwater quality standard applicable to the Mapleton Landfill for TDS is 2,539 mg/L.**

2. **Pursuant to 35 Ill. Admin. Code 817.106(b), Caterpillar has demonstrated, using the groundwater impact assessment procedures of Section 817.413 and the adjusted groundwater quality standard, that an increase in the MALC for TDS at the Mapleton Landfill will not result in an exceedance of the adjusted groundwater quality standard.**

3. **Therefore, an adjusted MALC of 2,539 mg/L for TDS in 35 Ill. Admin. Code 817.106(a) is permissible based on the adjusted groundwater quality standard.**

4. **Caterpillar will record and maintain in perpetuity in the property records an Environmental Land Use Control ("ELUC") in accordance with 35 Ill. Admin. Code 742.1010. The ELUC will prohibit the use of groundwater at the Mapleton Landfill for potable purposes.**

G. <u>Comparative impact of regulation of general applicability and adjusted standard. – Section 104.406(g)</u>

Caterpillar can demonstrate that the proposed adjusted standard will have no measurable impact on the environment. This conclusion is supported by the comprehensive evaluation of TDS concentrations and associated impacts by CRA during its hydrogeological investigation on the closest surface water body, the Illinois River, and on potential environmental receptors.

Based on surface water samples taken upstream and downstream of the Landfill and analyzed for TDS, there is no observable impact on TDS levels in the Illinois River due to leachate from the Landfill. Specifically, CRA conducted two rounds of sampling in April and May 2011. In the first sample event TDS concentrations were 527 mg/L upstream and 524 mg/L downstream, and in the second sample event TDS concentrations were 410 mg/L upstream and 430 mg/L downstream. (CRA Report at 28.) Further, CRA evaluated the amount of shallow groundwater discharge to the Illinois River compared to the flow rate of the Illinois River at its 7-day, 10-year annual (7Q10) low flow rate to provide a conservative estimate of potential TDS impact to the Illinois River. Based on this evaluation, CRA estimated a dilution factor of over 75,000, meaning that the concentration of TDS in the shallow groundwater discharging to the Illinois River would have to be increased by 75,000 mg/L in order to increase the concentration

of TDS in the Illinois River by 1 mg/L. (*Id.* at 42.) Because no such extreme concentration differences are observed at the Landfill, CRA concluded that the Landfill will have no impact on the water quality in the Illinois River under the proposed adjusted TDS standard. (*Id.* at 43.) This conclusion is further supported by the fact that Illinois has no surface water criterion for TDS. (*Id.* at 6.) If the impact to the Illinois River was being considered in the context of an NPDES permit rather than groundwater impacts to the Illinois River, TDS would not be regulated at all. Indeed, the NPDES permit for the Mapleton Plant, which authorizes discharges that ultimately go to the Illinois River, does not have a discharge limit for TDS.

CRA also evaluated all potential environmental receptors from the Landfill and found that there are no concerns posed by the proposed adjusted TDS standard. The potential receptors for groundwater at the site include human receptors and potential sensitive ecological receptors in the Illinois River where groundwater that flows beneath the Landfill discharges. (*Id.* at 44-46.)

There is no current usage of groundwater for any purpose and, based on the poor groundwater quality and Caterpillar's current and anticipated future operations at the site, it is unlikely that groundwater would be used in the future. Further, in support of the proposed adjusted standard, Caterpillar proposes instituting an ELUC restricting use of groundwater for potable purposes. Accordingly, groundwater ingestion is not a pathway of concern for potential human exposure. With respect to direct contact with groundwater or surface water, TDS does not represent a direct contact threat to humans. (*Id.*) Therefore, human exposure is not of concern under any of the potential pathways. (*Id.*)

The Illinois River and its associated tributaries and wetlands are the most significant ecological features near the Landfill; as such, the analysis of sensitive ecological receptors

focuses on groundwater flowing under the Landfill that discharges to the Illinois River. CRA conducted a technical review and determined there are no sensitive species or habitat for sensitive species near the Landfill. (*Id.* at 5, 44.) CRA concluded that that there is no statistically significant difference between upgradient TDS concentrations and the TDS concentrations downgradient of the Landfill. (*Id.* at 36-40.) Further, given the significant dilution effect that occurs with any groundwater discharges to the Illinois River, as evidenced by CRA's statistical and loadings evaluations, the Landfill will have no impact to the Illinois River. (*Id.* at 42-43.) Therefore, potential ecological receptors are not of concern near the Landfill. (*Id.* at 44.)

H. Caterpillar's justification for the proposed adjusted standard. – Section 104.406(h)

As noted above in Part III.C, if the justification for the adjusted standard is that the groundwater contains naturally occurring constituents that exceed the standards of 35 Ill. Admin. Code Part 620, then the Board can grant an adjusted standard based on the justification factors at Section 817.416(b)(2). In the absence of this justification, the general adjusted standard justification at Section 104.426(a) applies. In addition, the analysis below also discusses the groundwater impact assessment at Section 817.413.

1. Justification based on background TDS Levels – Section 817.416(b)(2)

As established by the hydrogeological investigation of the groundwater in the vicinity of the Landfill, background TDS levels exceed the groundwater quality standard and the MALC. Specifically, the upgradient groundwater exhibits a BTV TDS concentration of 2,539 mg/L. (*Id.* at 37.) Therefore, the background levels of TDS in the groundwater are a contributing factor preventing Caterpillar from achieving compliance with the 1,200 mg/L MALC for TDS at the Landfill, and, based on that fact, Caterpillar is entitled to an adjusted groundwater quality standard. As required by Section 817.416(b)(2), which governs adjusted groundwater standards

for groundwater containing naturally occurring constituents that do not meet the groundwater quality standards, Caterpillar demonstrates the following:

a. The groundwater does not presently serve as a source of drinking water.

There are no known sources of drinking water downgradient within a half-mile radius of the Landfill. Further, because the Landfill is situated directly upgradient of the Illinois River, thereby resulting in the aquifers below the Landfill effectively terminating at the Illinois River, the groundwater impacted by the Landfill is limited to Caterpillar's property where the Plant and Landfill are located. As such, only Caterpillar's use of the groundwater is relevant. Caterpillar does not currently use the groundwater as a drinking water source and proposes to restrict future use of groundwater for drinking water with an ELUC for the Landfill in connection with the proposed adjusted standard. The ELUC will also include a provision restricting use to industrial/commercial purposes.

b. The change in standards will not interfere with, or become injurious to, any present or potential beneficial uses for such waters.

CRA's analysis demonstrates that there is no evidence that leachate from the Landfill is impacting downgradient groundwater above the TDS concentration range observed in the upgradient groundwater and that there is no statistically significant difference between upgradient and shallow downgradient TDS concentrations. Accordingly, the proposed adjusted groundwater quality standard will have no measurable impact on downgradient groundwater sources. In addition, there are no known uses of the groundwater downgradient within a half-mile radius of the Landfill. Caterpillar does not currently use the groundwater for any purpose. Further, based on the poor quality of the groundwater, Caterpillar is unlikely to use the groundwater in the future. Accordingly, the proposed adjusted standard will not interfere with or become injurious to any present or potential beneficial uses of the groundwater. This will be

further supported by the ELUC restricting use of groundwater for potable purposes that Caterpillar proposes to institute at the Landfill.

c. The change in standards is necessary for economic or social development.

The Mapleton Landfill is required for the continued operation of the Mapleton Plant. As discussed in Part III.E, Caterpillar has been unable to identify any other commercially feasible compliance options for the Mapleton Landfill if it is not granted the proposed adjusted standard for TDS. In the absence of the requested regulatory relief, the profitability of the Mapleton Plant operations could be threatened. This could have both economic and social impacts on the community, including the potential loss of jobs and tax revenues. Moreover, given that the proposed adjusted standard would have no appreciable environmental impact, the likely economic and societal costs are not warranted when measured against any mandate to continue to comply with the current TDS limit of 1,200 mg/L.

d. The groundwater cannot presently, and will not in the future, serve as a source of drinking water based on one or more of the factors listed at 817.416(b)(2)(D).

As noted above, Caterpillar currently does not use the groundwater at the Plant for drinking water. Further, the groundwater will not in the future serve as a source of drinking water because, due to the relatively poor quality of the groundwater for drinking water purposes, it would be economically or technologically impractical to render that water fit for human consumption compared to using the adjacent Illinois River. Caterpillar already made this determination when it evaluated water sources for the Plant. Caterpillar determined that using water from the Illinois River was more cost effective than treating the groundwater to make it suitable for drinking water. (CRA Report at 10, 44.) Further, as noted above, Caterpillar is

proposing to put an ELUC in place at the Landfill prohibiting the use of groundwater for potable purposes.

2. General justification basis for an adjusted standard – Section 104.426(a)

In addition to the justification based on the fact that TDS in the groundwater at naturally occurring background levels does not meet the groundwater quality standards, proper justification also exists for an adjusted standard under Section 104.426(a) for a situation involving noncompliance with a particular applicable regulatory standard that nonetheless is not causing environmental harm. Because the compliance challenges associated with leachate TDS levels at the Mapleton Landfill are not resulting in any significant environmental impacts, Caterpillar can also justify the proposed adjusted standard based on demonstrating the general justification for an adjusted standard under Section 104.426(a):

> ***a. The factors relating to Caterpillar are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to Caterpillar; and the existence of those factors justifies an adjusted standard.***

The Board has granted adjusted standard petitions providing regulatory relief to landfills in situations similar to the Mapleton Landfill where leachate data exceeded applicable groundwater standards. *See, e.g., In re Petition for Adjusted Standard from 35 Ill. Admin. Code 620.420 for Nobel Risley's Landfill #2* [*Nobel Risley's Landfill*], AS 08-3 (Nov. 5, 2008) (adjusted standard from chloride and sulfate groundwater quality standards); *In re Petition of the Village of Bensenville for an Adjusted Standard from 35 Ill. Admin. Code 620.410 Regarding Chloride* [*Bensenville*], AS 05-2 (Oct. 20, 2005) (adjusted standard from chloride groundwater quality standard); *In re Petition of Hayden Wrecking Corp. for an Adjusted Standard from 35 Ill. Admin. Code 620.410(a)* [*Hayden Wrecking*], AS 04-03 (Jan. 6, 2005) (adjusted standard from arsenic, iron, lead, and manganese groundwater quality standards).

In those cases, justification for granting the requested relief was based on the petitioners' demonstrating that the elevated leachate concentrations were not causing any negative environmental impacts. In each case, the Board concluded that substantially and significantly different factors were present that justified granting the requested regulatory relief under Section 104.426(a). *See Hayden Wrecking,* at 19 ("[Petitioner] has demonstrated that the potable use of the groundwater at its site does not now occur and is effectively forbidden, making its factors and circumstances substantially and significantly different than those relied upon by the Board in adopting Class I groundwater standards"); *see also Nobel Risley's Landfill #2,* at 16 (finding that high treatment costs coupled with lack of environmental benefits justifies a determination that substantially and significantly different factors exist.).

Similarly, Caterpillar's situation at the Mapleton Landfill involves substantially and significantly different factors than those relied upon when Part 817 was promulgated, and the requested adjusted standard is clearly supported by these unique circumstances. Part 817 provides requirements for the design, location, and operation of new landfills receiving steel and foundry wastes. However, the Mapleton Landfill was already in existence and had been operating for over 15 years (as discussed previously, at a site with known elevated TDS concentrations in groundwater) at the time that Part 817 was adopted. Accordingly, Caterpillar is not in a position to control or account for siting, location characteristics, and other considerations that could be addressed by an operator constructing a new Part 817 landfill. Further, the groundwater is not being used and no future use is anticipated. Therefore, the TDS MALC, which was originally established in Part 817 at the same concentration as the Class I groundwater standard, is not reflective of the relevant circumstances at the Mapleton Landfill.

Moreover, as demonstrated by CRA's analysis, the leachate from the Mapleton Landfill is not impacting the groundwater or negatively affecting any downgradient receptors. Finally, Caterpillar has no viable alternatives to the proposed adjusted standard. As explained in Part III.E, all of the alternatives for ensuring compliance would be cost-prohibitive. Similar to the Board's prior decisions in *Nobel Risley's Landfill*, *Bensenville*, and *Hayden Wrecking*, such costly alternatives are entirely unwarranted given the absence of any environmental or human health impacts resulting from the TDS concentrations in leachate at the Mapleton Landfill.

Therefore, Caterpillar's situation at the Mapleton Landfill is substantially and significantly different than what was contemplated by the regulation of general applicability, and these factors justify the proposed adjusted standard.

b. The requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability.

As discussed above at Part III.G, the proposed adjusted standard is not expected to result in any impacts to potential environmental receptors.

c. The adjusted standard is consistent with any applicable federal law.

As reflected in the subsequent discussion at Part III.I, the proposed adjusted standard is consistent with federal law.

3. Groundwater Impact Assessment.

Because Caterpillar's ultimate objective in seeking an adjusted groundwater quality standard is to obtain an adjusted MALC for TDS at the Mapleton Landfill under Section 817.106(b), Caterpillar must also use the groundwater impact assessment procedures of Section 817.413 to demonstrate that the MALC increase will not result in an exceedance of the adjusted groundwater standard. As explained below and in more detail in CRA's Report, because the leachate values obtained to date are less than the proposed adjusted groundwater quality standard

and adjusted MALC of 2,539 mg/L, Caterpillar will be able to comply with the applicable groundwater quality standard and corresponding MALC, and the groundwater impact assessment is acceptable pursuant to Section 817.413(b). (CRA Report at 47-49.)

a. The aquifer conductivity is 1x10(-5) cm/sec or less and the remaining steps of the groundwater impact assessment are applicable.

The hydraulic conductivity of the water bearing units beneath and downgradient of the Landfill exceeds 1E-05 cm/s. (*Id.* at 47-48.)

b. Based on the conceptual groundwater flow model of the site, the Upper Sand Unit beneath and downgradient of the Landfill is the soil unit through which leachate constituents are most likely to migrate.

As explained in the CRA Report, the shallow and deep groundwater upgradient of the Landfill flows south towards the Illinois River and discharges into the alluvial water bearing units present beneath the Landfill and commingles with groundwater in the alluvial system. (*Id.* at 48.) Landfill leachate flows downward from the Landfill and commingles with the groundwater present in the shallow alluvial water bearing unit beneath the Landfill. (*Id.*) The alluvial water bearing unit consists of a Upper Sand Unit (shallow) separated from a Lower Sand Unit (deep) by an Intermediate Clay Aquitard. (*Id.*) The greatest potential effects from the Landfill leachate are expected to be in the Upper Sand Unit beneath and downgradient of the Landfill. (*Id.*)

c. The organic carbon content of the soil at the site ranged from 2 to 4.5%, with an average of 3.2%.

Based on the hydrogeological investigation, the organic carbon content of the soil at the site ranged from 2 to 4.5%, with an average of 3.2%. (*Id.*)

d. The retardation factor in the permeable sand units during advection is not expected to be significant and is assumed to be zero.

Retardation of TDS in the permeable sand units during advection is not expected to be significant, and in its evaluation CRA assumed the redardation factor to be zero. (*Id.* at 49.)

e. The MALC value for TDS required to achieve compliance with the applicable groundwater quality standard, assuming the proposed adjusted standard is granted, is 2,539 mg/L.

Assuming the Board grants the proposed adjusted standard of 2,539 mg/L, the MALC value for TDS required to comply with the adjusted groundwater quality standard of 2,539 mg/L would also be 2,539 mg/L. (*Id.*) As explained in the hydrogeological report, 2,539 mg/L is the appropriate compliance standard because it reflects the background values for TDS in the upgradient groundwater. (*Id.*)

f. Based on comparison of the calculated MALC value of 2,539 mg/L to the Landfill leachate values, compliance with the adjusted groundwater quality of 2,539 mg/L can be met.

A comparison of the Landfill leachate values compared to the calculated MALC of 2,539 mg/L demonstrates that the adjusted groundwater quality standard of 2,539 mg/L can be met because both numbers are the same as the BTV and the BTV has been calculated from Landfill leachate values. (*Id.* at 37, 49.) Specifically, BTV provides a value for which there is 99% confidence that 95% of new data (*i.e.*, future leachate samples) will not exceed the value if it is representative of background conditions. (*Id.* at 30-31, 37, 49.) Accordingly, the Landfill leachate will meet the adjusted TDS standard of 2,539 mg/L. (*Id.* at 49.)

I. Consistent with federal law. – Section 104.406(i)

The Board may grant the proposed adjusted standard consistent with federal law because there are no federal statutory or regulatory requirements implicated by the proposed adjusted standard. No federal statute or regulation mandates standards for groundwater that is not used as a source of drinking water. Further, there are no applicable procedural requirements imposed by federal law.

Groundwater quality is regulated under federal law only under the Safe Drinking Water Act ("SDWA"), 42 U.S.C. § 300f *et seq.*, and then only to the extent that groundwater is a source of drinking water provided by a public water supply, which is not the case here. Further, even if the SDWA were relevant, the SDWA secondary maximum contaminant level for TDS of 500 mg/L is merely a "reasonable goal" and "States may establish higher or lower levels which may be appropriate dependent upon local conditions . . . ." 40 C.F.R. § 143.3. In sum, there are no relevant SDWA requirements that must be considered in connection with the proposed adjusted standard.

J. Hearing. – Section 104.406(j)

Caterpillar waives a hearing on this Petition.

K. Supporting documents. – Section 104.406(k)

1. Permit No. 1995-154-LFM
2. CRA Hydrogeological Investigation Report dated May 28, 2013
3. CRA Memorandum dated June 29, 2012, "Basis and Cost Estimate for Conceptual Landfill Leachate Treatment System"

L. Any additional information required by regulation of general applicability. – Section 104.406(l)

There is no other additional information required by the regulation of general applicability for an adjusted standard.

IV.

CONCLUSION

Caterpillar's proposed adjusted standard is a reasonable request and can be justified under the Board's regulations, given the factors relevant to the Mapleton Landfill. The groundwater in the area is not used for drinking water, and the hydrogeological investigation shows that the groundwater is characterized by high levels of naturally occurring TDS unrelated to the TDS

concentration of leachate from the Landfill. Accordingly, Caterpillar believes that it can only achieve compliance through an adjusted groundwater quality standard and corresponding adjusted MALC for TDS. In the absence of the requested regulatory relief, any other compliance alternative would be commercially infeasible and prohibitively expensive.

WHEREFORE, Caterpillar respectfully requests that the Board grant the proposed adjusted groundwater quality standard of 2,539 mg/L for TDS and a corresponding MALC of 2,539 mg/L for TDS for the Mapleton Landfill.

Respectfully submitted,

Caterpillar Inc.

Dated: June 27, 2013

By:_____
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CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Petition of Caterpillar, Inc. for an Adjusted Standard from 35 Ill. Admin. Code 620.410(a) and 817.106(a), upon the following persons on the 27th day of June, 2013:

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