BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PROPOSED SITE SPECIFIC RULE	)	R09-11
APPLICABLE TO THE CITY OF GALVA	)	(Site Specific Rulemaking – Water)
SEWAGE TREATMENT PLANTS	)	
DISCHARGE TO EDWARDS RIVER	)	
AND MUD RUN CREEK	)	
35 ILL. ADM. CODE 303.447 AND 303.448	)	

NOTICE OF FILING

TO: Mr. John Therriault
Assistant Clerk of the Board
Illinois Pollution Control Board
100 West Randolph Street
Suite 11-500
Chicago, Illinois 60601
(VIA ELECTRONIC MAIL)
(SEE PERSONS ON ATTACHED LIST)

PLEASE TAKE NOTICE that I have today filed with the Office of Clerk of the Illinois Pollution Control Board **GALVA'S POST-HEARING COMMENTS** and **ADDENDUM TO TESTIMONY OF STEPHEN M. BRUNER**, copies of which are herewith served upon you.

Respectfully submitted,

CITY OF GALVA, Petitioner,

By: /s/ Claire A. Manning
One of Its Attorneys

Dated: April 30, 2009

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GALVA'S POST-HEARING COMMENTS

NOW COMES the City of Galva ("Galva"), by and through its attorneys Brown, Hay & Stephens, LLP, and hereby provide the Illinois Pollution Control Board ("Board") with the following post-hearing comments:

I. PROCEDURAL HISTORY

On October 17, 2008, Galva filed a Petition for Site Specific Rule ("Petition") to apply to Galva's effluent discharge with respect to boron distinct from the 1.0 mg/L water quality standard for boron found at 35 Ill. Adm. Code 302.208(g), developed by the Board in 1972 as a "water quality" standard but not as an "effluent" standard. *See In the Matter of: Effluent Criteria,* R70-8*; In the Matter of: Water Quality Standards Revisions,* R71-14*; In the Matter of Water Quality Standards Revisions for Intrastate Waters (SWB-14),* R71-20, (consolidated), Board Opinion, March 7, 1972. The proposed Site Specific Rule would constitute an alternative water quality standard applicable to the effluent discharge of boron from Galva's two Sewage Treatment Plants ("STPs"). Galva also filed a Technical Support Document ("TSD") in support of the Petition, Pre-filed Testimony of Dr. Brian Anderson, a Motion to Waive Requirement to Submit 200 Signatures, and a Motion for Expedited Review.

On February 5, 2009, the Board issued its First Notice Opinion and Order accepting the proposal for hearing and granting Petitioners' Motion to Waive Requirement to Submit 200 Signatures, but denying the Motion for Expedited Review. Nonetheless, the Board Opinion accepted the Proposed Site Specific Rule for First Notice publication, without comment on the proposal's merits. *See* Board Opinion, R09-11, Feb. 5, 2009 and (March 6, 2009). The proposed rule appeared in the Illinois Register on March 6, 2009. *See* Ill. Reg. Vol. 33 Issue 10, p.2898 (March 6, 2009).

On February 19, 2009, the Hearing Officer issued an Order scheduling a hearing for March 31, 2009, at 10:00 a.m. in Galva ("Hearing") to fulfill the statutory obligations under Section 27(b) of the Environmental Protection Act (Act) (415 ILCS 5/27(b)(2006)).

On February 25, 2009, the Illinois Environmental Protection Agency ("Agency"), filed the Pre-filed Testimony of Brian Koch, toxicologist for the Division of Water Pollution Control. In his testimony, Mr. Koch discussed Galva's proposed site-specific rule and recommended "that the Board grant relief from the water quality standard for boron as requested by the Petitioner." He also stated that the "Illinois EPA believes that a chronic boron standard of 3.0 mg/L and possibly significantly higher is appropriate." *See* Pre-filed Testimony of Brian Koch.

On March 16, 2009, Galva filed the Pre-filed Testimony of David L. Dyer and Stephen M. Bruner, witnesses presented at the March 31, 2009 Hearing.

On March 31, 2009, the Hearing was conducted in Galva. David Dyer, Larry Lawson, Stephen Bruner, Brian Anderson and Claire Manning appeared as representatives of Galva and Vera Hurst and Brain Koch appeared as representatives of the Agency. Updated information and responses to technical questions presented at the Hearing and directed to Stephen Bruner are filed simultaneously with this filing as "Addendum to Testimony of Stephen Bruner".

On April 6, 2009, the Hearing Officer issued an Order setting the date for final comments on the rulemaking proposal for April 30, 2009, and the Hearing Transcript and Exhibit list was published.

II. APPLICABLE STANDARD FOR THE PROMULGATION OF THE PROPOSED SITE SPECIFIC RULE

Section 27 of the Illinois Environmental Protection Act ("Act") gives the Board the authority to adopt substantive regulations that "may make different provisions as required by circumstances for different contaminant sources and different geographical areas..." 415 ILCS 5/27(a). This section also provides the appropriate standard for promulgation of new rules:

> the Board shall take into account the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing air quality, or receiving body of water, as the case may be, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution.
>
> 415 ILCS 5/27(a) (2006).

The Board has acknowledged the applicability of this standard in previous cases regarding site specific relief. *See In the Matter of Marathon Oil Co.'s Petition for Site-Specific Rule Change to 35 Ill. Admin. Code 303.323*, R91-23, Board Opinion, Oct. 7, 1993. The Agency and the USEPA have also recognized that the Board may grant specific facilities permanent relief from the general use water quality standards. *See LTV Steel Co. v. EPA*, R91-49, Board Opinion, June 1, 1995. Therefore Galva urges the Board to approve the Site Specific Rule based on the evidence presented in the record and consistent with the standards set forth in Section 27(a) of the Act.

III. THE RECORD SUPPORTS GRANTING THE SITE SPECIFIC RULE

As explained more in detail as part of Galva's Petition and during the Hearing, Galva is seeking a Site Specific Rule to establish an alternative standard for discharge from Galva's two

Sewage Treatment Plants (STPs): the Northeast and Southwest STPs, which discharge into an unnamed tributary of the South Branch of the Edwards River and Mud Run Creek, respectively. The general use water quality standard for boron in 1.0 mg/L and found at 35 Ill. Adm. Code §302.208(g), and the Board has declined to establish an effluent standard for boron. *See In the Matter of: Effluent Criteria*, R70-8; *In the Matter of: Water Quality Standards Revisions*, R71-14; In *the Matter of Water Quality Standards Revisions for Intrastate Waters (SWB-14)*, R71-20, (consolidated), Board Opinion, March 7, 1972. Nonetheless, as explained at Hearing, where discharge is not capable of mixing with an existing water body (as here), the Agency applies the water quality standard as an effluent standard. Brian Koch of the Agency verified the Agency will apply a water quality standard as an effluent standard. Therefore, where the discharge is into a zero flow stream at this location, a mixing zone is not available because the STPs discharge into zero-flow streams. As a result, "the water quality standard of one milligram per liter of boron will have to be the effluent standard." *See* Hearing Transcript, p.31-32. Accordingly, the Agency has applied the general use standard as an effluent standard in Galva's Southwest STP NPDES Permit (No. IL0023647).

The reason for the Board's establishment of the 1.0 mg/L boron standard was to protect crops. *Id.* The Galva STP receiving waters do not support irrigation. There are no federal water regulations concerning boron.

As demonstrated by water sampling results from the city's two municipal water supply wells which were submitted to the Board as part of the TSD, boron is an element found naturally in Galva's Municipal Water Supply. *See* TSD p.6. Galva's Municipal Water Supply ultimately feeds into Galva's two STPs. The Southwest STP NPDES Permit was amended, effective

August 4, 2004, to require sampling for boron as of September 1, 2007, and to require that its effluent comply with a boron limitation of 1.0 mg/L. *See* TSD Appendix B.

As set forth in the Petition and at the Hearing, Galva cannot meet the 1.0 mg/L boron standard as applied by the Agency. is a small, rural community, population 2,758, located in south central Henry County. *See* Petition p. 4. Galva evaluated the costs of installing available treatment and control options including ion exchange and reverse osmosis, as well as the costs of installing new wells or obtaining water from neighboring towns. *See* Petition p.14-23.

At the Hearing, the following witnesses presented testimony in support of Galva's petition: David Dyer, Stephen Bruner, Larry Lawson, and Brian Anderson. That testimony can be summarized as follows:

David Dyer. David Dyer is the city administrator for the City of Galva. His pre-filed testimony establishes that there are no other economically reasonable alternative solutions for Galva, a small rural municipality, to use to achieve compliance with the 1.0 mg/L boron standard applied as an effluent standard in the NPDES permit.

Stephen Bruner. Steve Bruner is the Licensed Professional Engineer and Licensed Land Surveyor employed by Bruner, Cooper & Zuck, Inc. His testimony established that over a three year monitoring period, boron levels were usually less than 2.0 mg/L. *See* Hearing Transcript, p.17. The two elevated results were due to drought conditions. *Id.* at 17-18. The numbers he used in the mass balance calculations were conservative and based on actual plant flows rather than 7Q10 flows and did not take into account any other dischargers. *Id.* at 21-23, 28.

Larry Lawson. Larry Lawson has been the plant operator for the City of Galva's STPs since 1980 and has a bachelor's degree in chemistry and a master's degree in organic

chemistry from Iowa State. *Id.* at 25. His testimony established that Galva's STP flows are typically higher than the 7Q10 flow numbers. *Id.* at 26. The 0.37 cfs minimum average flow used in the mass balance calculations correlates to the years that the boron samples were collected, 2004-2006, and May of 2008. *Id.* at 27-28.

Dr. Brian Anderson. Dr. Brian Anderson is the Director of the Illinois Natural History Survey and has a Ph.D. in biology. His pre-filed testimony establishes that a boron water quality standard of 1.0mg/L is over-protective of aquatic life. *See* Pre-Filed Testimony of Dr. Brian D. Anderson, p. 8. With respect to boron toxicity, citrus crops and fruit trees are the more susceptible species, and there are none of concern in Illinois. *Id.* at 4. Dr. Anderson also highlighted the fact that the U.S. Environmental Protection Agency does not recommend the establishment of any water quality standards for boron, not even a drinking water standard. *Id.* at 7.

Mr. Brian Koch, Water Quality Standards toxicologist from the Division of Water Pollution Control, testified on behalf of the Agency. Mr. Koch agreed that Galva's Site Specific Rule should be granted for the following reasons. First, the Agency agrees that "the expenses and technical infeasibilities of the assessed alternatives are unreasonable, especially when considering the unanticipated risks associated with the proposed site-specific boron standard of 3.0 mg/L." *See* Pre-filed Testimony of Brian Koch. Second, the Agency is not aware of any irrigation being provided through the use of the waters associated with this rulemaking, and the original establishment of the 1.0mg/L standard was to protect crops from boron in irrigation water. *Id.* Finally, based on currently available acute and chronic toxicity data, the Agency believes that a chronic boron standard of 3.0mg/L ***and possibly significantly higher*** is

appropriate. *Id.* (Emphasis added). As a result, Mr. Koch and the Agency recommend that the Board grant relief from the water quality standard for boron as requested. *Id.*

Galva has worked closely with the Agency over the past few years to address the boron issue in Galva, and the Agency recommended pursuing this site-specific relief. Galva has demonstrated through the record in this proceeding that alternatives to the proposed Site Specific Rule would be technically infeasible and economically unreasonable. The testimony, and record as a whole, demonstrate that the proposed Site Specific Rule will not result in any environmental harm and that the prohibitive costs associated with each of these measures for such a small town render technical enhancements to reduce the discharge to 1.0 mg/L as inherently economically unreasonable and environmentally unnecessary. Thus, site specific relief from Section 302.208(g) is proper.

Subsequent to the Hearing, and in response to questions of the Board, the Addendum Testimony of Stephen M. Bruner ("Addendum") has been prepared and is submitted with this filing. The Addendum addresses four specific questions.

1. A typographical error in the TSD where the concentration of boron was incorrect and did not match up with that listed in Figure 12 of the TSD was corrected. It includes a line which was also inadvertently omitted from the text of the TSD, so that it corresponds to Figure 12 of the TSD.
2. Mr. Bruner clarified that the flow rates used in the mass balance calculations are the *lowest* average monthly discharge values for July 2006 at the NE STP rather than the average flow rates. As Mr. Bruner stated at the Hearing, he used actual values from the STPs rather than published 7Q10 flows.

3. Figure 12 was updated to correct the typographical error regarding the boron concentration calculated near Mud Run's confluence with Walnut Creek.
4. Finally, subsequent to the Hearing Mr. Brian Koch provided Mr. Bruner ambient water quality monitoring data from Indian Creek near Galva. This data suggests that background boron concentrations in area receiving streams during drought conditions (a worst case scenario) would be 0.140 mg/L, whereas the TSD assumed a background concentration of 0 mg/L. An additional discharger to Walnut Creek was also discovered subsequent to Hearing. The Village of Altona's STP discharges into Walnut Creek prior to its confluence with Mud Run Creek. Mr. Bruner used this background worst-case scenario data and an additional STP discharge of 3.0 mg/L from Altona STP to re-calculate the final boron concentration at the point after Mud Run Creek joins Walnut Creek to be 0.5 mg/L, which is well below the 1.0 mg/L water quality standard, and achieved at the confluence points originally indicated in the TSD. *See* Addendum, p.2.

IV. PROPOSED LANGUAGE

As discussed with the Agency, the Site Specific Rule proposed by Galva would read as follows:

Section 303.34X. Unnamed Tributary of the South Branch Edwards River and South Branch Edwards River

The boron general use water quality standard of 35 Ill. Adm. Code 302.208(g) does not apply to the waters of the State that are located from the point of discharge of the POTW located at 523 NE 9th Street in Galva, known as the Galva Northeast Sewage Treatment Plant, to an unnamed tributary of the South Branch of the Edwards River, said point being located in Henry County, Township 14 North, Range 4 East, occupying portions of Sections 21, 26, 27, 28, 33, 34, and 35 in the Fourth Principal Meridian, Latitude N 41.175°, Longitude: W 90.035°, to

the confluence of said unnamed tributary with the South Branch Edwards River; to the confluence with the Edwards River. Boron levels in such waters must meet a water quality standard for boron of 3.0 mg/L.

Section 303.40X. Mud Run Creek

The boron general use water quality standard of 35 Ill. Adm. Code 302.208(g) does not apply to the waters of the State that are located from the point of discharge of the POTW located ½ mile South of BNSF RR and SW 4th Street in Galva, known as the Galva Southwest Sewage Treatment Plant, to Mud Run Creek, said point being located in Henry County, Township 14 North, Range 4 East of the Fourth Principal Meridian occupying portions of Sections 21, 26, 27, 28, 33, 34, and 35, Latitude 41.154°, Longitude 90.053°, to the confluence of Mud Run Creek with Walnut Creek. Boron levels in such waters must meet a water quality standard for boron of 3.0 mg/L.

V. CONCLUSION

The record fully supports the requested site specific relief from the boron standard for Galva. Galva has consulted with the Agency throughout the development of this Petition, and the Agency fully supports and recommends that "the Board grant relief from the water quality standard for boron as requested by the Petitioner." *See* Pre-filed Testimony of Brian Koch, Agency Toxicologist; *see also* Hearing Transcript, p.30. Although Galva does not agree that the 1.0 mg/L water quality standard is appropriately applied as an effluent standard in Galva's NPDES permits, given the Agency's position on this point, Galva has deemed it most expeditious to seek the necessary relief in the nature of a site specific water quality rule, as the Agency recommended.

The evidence in the record has established that it is not technically feasible nor economically reasonable for Galva, a small rural community, to meet the 1.0 mg/L boron water quality standard. Without this relief, Galva will be materially prejudiced, since an unachievable and unnecessary permit condition will continue to be present in its NPDES permit, causing it to be in violation of the Act for no legitimate environmental reason. Galva believes a 3.0 mg/L

boron standard is achievable, but conservative. Should the Board determine the record demonstrates that a higher standard is warranted, obviously Galva would not object.

WHEREFORE, for the above-cited reasons, Galva respectfully requests that the Board grant this Petition and adopt the proposed Site Specific Rule.

Respectfully submitted,

CITY OF GALVA
Petitioner,

By: /s/ Claire A. Manning
One of its Attorneys

Dated: April 30, 2009

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IN THE MATTER OF:	)	
PROPOSED SITE SPECIFIC RULE	)	
APPLICABLE TO THE CITY OF GALVA	)	R09-011
SEWAGE TREATMENT PLANTS	)	(SITE SPECIFIC RULE MAKING – WATER)
DISCHARGE TO EDWARDS RIVER	)	
AND MUD RUN CREEK		
35 ILL. ADM. CODE 303.447 AND 303.448	)	

ADDENDUM TO TESTIMONY OF STEPHEN M. BRUNER

On March 31, 2009, I testified before the Illinois Pollution Control Board regarding the above cited matter. This statement is in clarification of, and in addition to, the testimony given by me on that date.

1. On page 15 of the "Technical Support Document, Site Specific Water Quality Standard, Galva, Illinois", prepared by me, the last line of this page reads:

   $C_{BORON\ ADDED} = 0.94$ mg/L

   This line should in fact read:

   $C_{BORON\ ADDED} = 1.19$ mg/L = Boron concentration in South Branch Edwards River just prior to confluence with Edwards River

   The next line, which was omitted, should read:

   After the confluence with the Edwards River, the calculated Boron concentration would be:

   $C_{BORON} = [0.37 \text{ cfs} \times 3.0 \text{ mg/l}] / [0.93 \text{ cfs} + 0.25 \text{ cfs}] = 0.94$ mg/l

   These values agree with the concentrations and flow rates shown on Figure 12 in the Technical Support Document.

   Revised Document pages 15 and 16 are attached to this Statement.

2. I was asked by the Board's Engineer about the discrepancy between the published 7Q10 flow rates at Galva's NE and SW STP's and the somewhat different flow rates used in the Document's mass balance calculations. The values used (0.37 cfs @ NE STP and 0.015 cfs @ SW STP) are not the average STP flow rates, but in fact are the lowest average monthly discharge values for July 2006 at the NE STP (paragraph 4.2, page 15) and November, 2006 at the SW STP (paragraph 4.3, page 16).

3. Figure 12 was found to have a drafting error. Specifically, the note that reads:

   Boron Concentration = 0.03 mg/l
   7Q10 Flow = 0.015 cfs

   near Mud Run's confluence with Walnut Creek should in fact read:

   Boron Concentration = 1.5 mg/l
   7Q10 Flow = 0.03 cfs

   A revised Figure 12 is attached to this Statement.

4. The mass balance calculations contained in the Technical Support Document assume a background boron concentration of 0 mg/l in the receiving waters prior to accepting the discharges from the NE and SW STP's. However, Mr. Brian Koch of the Illinois Environmental Protection Agency has provided ambient water quality monitoring data taken from Indian Creek near Galva, that suggests a worst case (during drought conditions) background boron concentration in area receiving streams of 0.140 mg/l. A copy of this data is included with this statement.

   In addition, it was discovered that the Village of Altona STP discharges into Walnut Creek prior to its confluence with Mud Run. The 7Q10 flow at the Altona STP is 0.01 cfs. If the receiving streams (Mud Run and Walnut Creek) tributary to Galva's SW STP are assumed to have a background boron concentration of 0.140 mg/l, and Altona's STP is assumed to have a maximum boron concentration of 3.0 mg/l, the final boron concentration after Mud Run joins Walnut Creek (7Q10 flow = 0.20 cfs) may be calculated thus:

$$C_{BORON} = \underbrace{\frac{0.01\text{ cfs }(3.0\text{ mg/l})}{0.20\text{ cfs}}}_{\text{(Altona STP)}} + \underbrace{\frac{0.015\text{ cfs }(3.0\text{ mg/l})}{0.20\text{ cfs}}}_{\text{(Galva SW STP)}} + \underbrace{\frac{0.175\text{ cfs }(0.14\text{ mg/l})}{0.20\text{ cfs}}}_{\text{(Receiving Stream)}} = 0.5\text{ mg/l}$$

   which is well below the standard of 1.0 mg/l.

   A similar calculation can be made at the point where the south Branch of the Edwards River joins the Edwards River:

$$C_{BORON} = \underbrace{\frac{0.37\text{ cfs }(3.0\text{ mg/l})}{1.18\text{ cfs}}}_{\text{(Galva NE STP)}} + \underbrace{\frac{0.81\text{ cfs }(0.14\text{ mg/l})}{1.18\text{ cfs}}}_{\text{(Receiving Stream)}} = 1.0\text{ mg/l}$$

   This calculation indicates that a dilution to the water quality standard of 1.0 mg/l of boron occurs at this point north of the NE STP.

It should be noted that the background boron data provided may in fact be influenced by discharges from area Sewage Treatment Plants. However, by using the "worst case" value of 0.140 mg/l as a background concentration of boron, the above calculations suggest that dilution to a level of 1.0 mg/l and below is achieved at the confluence points originally indicated in the Technical Support Document.

Respectfully submitted:

By: Stephen M. Bruner

Stephen M. Bruner, P.E., P.L.S.
City Engineer
Illinois Licensed Professional Engineer No. 40386

STEPHEN M. BRUNER
40386
LICENSED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

From the data provided in Figure 6, the City of Galva would need permission to discharge from their existing sewage treatment plants an effluent flow with a concentration of up to 3 mg/L of boron. This was the maximum recorded boron concentration recorded since September of 2004.

Stream flow data was collected using the 7 Day 10 Year Low Flow Map (7Q10 Map) for the Spoon River Region published by the Illinois State Water Survey (ISWS) and the Illinois Streamflow Assessment Model available online from the ISWS. The low flow stream discharges were assessed at the 7 day-10 year low flow event (7Q10).

Using the minimum average monthly discharge data from the STPs from 2006 (Figure 7), and assuming that the maximum recorded boron concentration was to occur during a low flow period, the extents of the necessary relief were calculated using the below equation for each of the sewage treatment plants.

$$C_{BORON\ ADDED} = [Q_{STP} \times C_{STP}] / [Q_{STP} + Q_{STREAM}]$$

Where:

$C_{BORON\ ADDED}$ = Final boron concentration in receiving stream (mg/L)
Q_{STP} = Discharge from sewage treatment plant (cfs)
C_{STP} = Boron concentration in STP discharge (mg/L)
Q_{STREAM} = Water flow in stream during Q710 conditions (cfs)

4.2 Northeast STP Effluent Mass Balance

The lowest average monthly discharge for the Northeast STP for 2006 was 0.37 cfs. This was the average discharge for the month of July 2006 (Figure 5).

During low flow periods (7Q10), the discharge from the Northeast STP would receive adequate dilution at the point where the South Branch of the Edwards River discharges and mixes with the Edwards River. It is at this point that the boron concentration in the stream would drop below 1 mg/L during 7Q10 conditions.

$C_{BORON\ ADDED} = [Q_{STP} \times C_{STP}] / [Q_{STP} + Q_{STREAM}]$

$C_{BORON\ ADDED} = [0.37\ cfs \times 3.0\ mg/L] / [0.93\ cfs]$

$C_{BORON\ ADDED}$ = 1.19 mg/L = Boron concentration in South Branch Edwards River just prior to confluence with Edwards River

After the confluence with the Edwards River, the calculated Boron concentration would be:

$$C_{BORON} = [0.37 \text{ cfs} \times 3.0 \text{ mg/l}] / [0.93 \text{ cfs} + 0.25 \text{ cfs}] = 0.94 \text{ mg/l}$$

Thus dilution would occur approximately 16.1 miles downstream of the outfall of the Northeast STP.

It should be noted that this is a worst case scenario, and during normal stream flow conditions, dilution would occur much closer to the discharge of the Northeast STP.

Refer to Figure 12 for a map depicting the point of dilution for the Northeast STP.

4.3 Southwest STP Effluent Mass Balance

The lowest average monthly discharge for the Southwest STP for 2006 was 0.015 cfs. This was the average discharge for the month of November 2006 (Figure 5).

During low flow periods (7Q10), the effluent from the Southwest STP would receive adequate dilution at the point just past where Mud Run discharges into Walnut Creek. Again, it should be noted that this is a worst case scenario, during normal conditions, dilution would occur closer to the discharge of the Southwest STP.

$$C_{BORON\ ADDED} = [Q_{STP} \times C_{STP}] / [Q_{STP} + Q_{STREAM}]$$

$$C_{BORON\ ADDED} = [0.015 \text{ cfs} \times 3.0 \text{ mg/L}] / [0.20 \text{ cfs}]$$

$$C_{BORON\ ADDED} = 0.225 \text{ mg/L}$$

Thus dilution would occur approximately 7 miles from the outfall of the Southwest STP.

Refer to Figure 12 for a map showing the point of dilution of the Southwest STP. Detailed mass balance calculations for each of the sewage treatment plants may be found in the appendix of this report.

5. Environmental Effects of a Site Specific Water Quality Standard

5.1 Nature of Boron

Boron is a naturally occurring element that is found in nature in compounds called borates. Borates are found in the oceans, sedimentary rocks, coal, shale, and some soils. Borates are naturally released into the environment from the oceans,

* * * * * PC #2 * * * * *

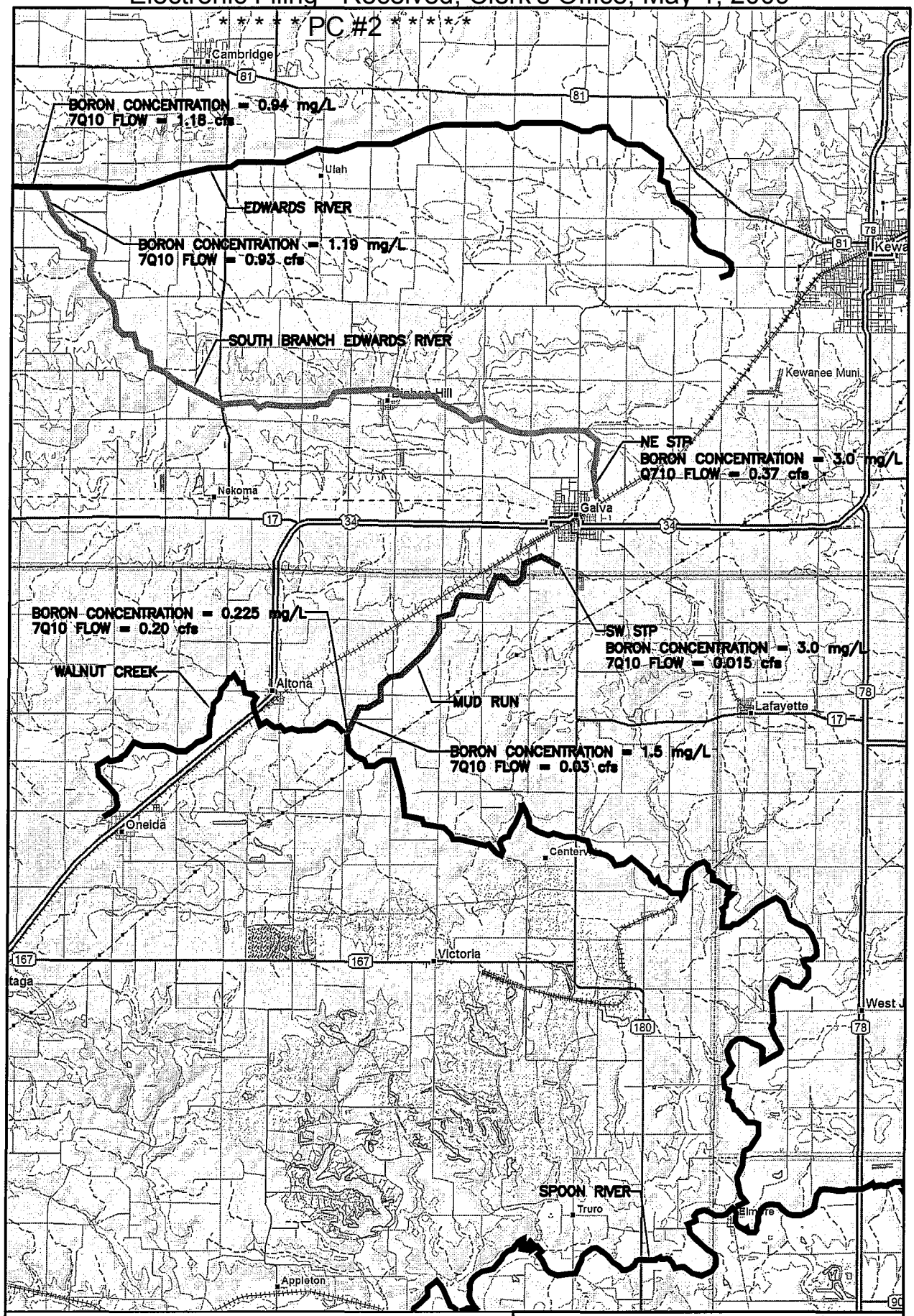

FIGURE 12

POINTS OF DILUTION

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Consulting Engineers · Structural Engineers · Land Surveyors
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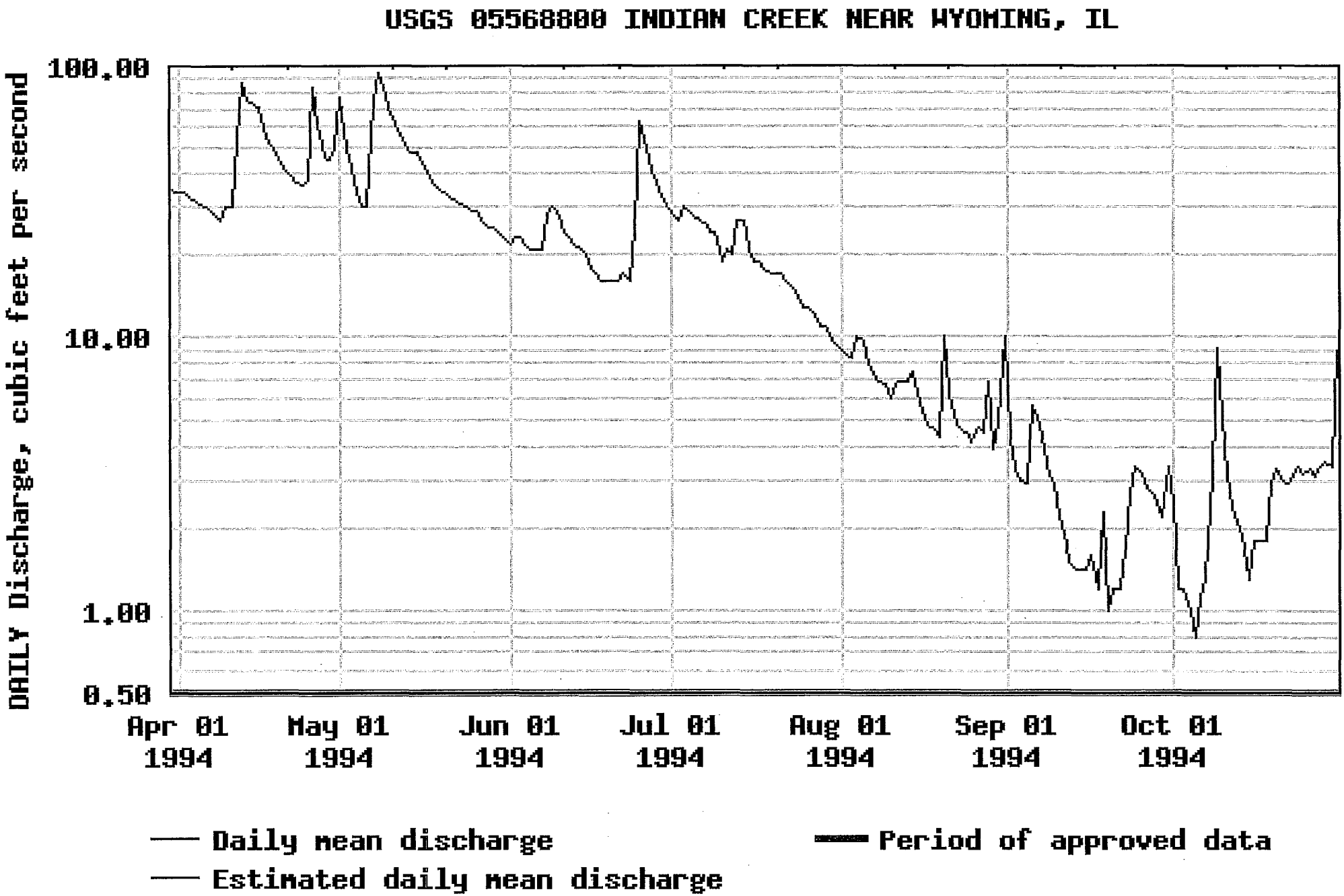
JOB NO. 250099	DATE: 01/23/2007	
DRAWN: KCK	CHECKED: SRM	APPROVED:


USGS 05568800 INDIAN CREEK NEAR WYOMING, IL
DAILY Discharge, cubic feet per second
100.00
10.00
1.00
0.50
Apr 01 1994
May 01 1994
Jun 01 1994
Jul 01 1994
Aug 01 1994
Sep 01 1994
Oct 01 1994
Daily mean discharge
Estimated daily mean discharge
Period of approved data

Organizatic	Organizatic	Primary St	Secondary	Secondary	Secondary	Station Loc	Station Loc	Station Loc
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
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21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01			INDIAN CRI	UPPER MIS	ILLINOIS RI
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21ILAMB	ILLINOIS EP	5568800	DJL 01	INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01	INDIAN CRI	UPPER MIS	ILLINOIS RI
21ILAMB	ILLINOIS EP	5568800	DJL 01	INDIAN CRI	UPPER MIS	ILLINOIS RI

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State	County	Latitude	Longitude	Hydrologic	Legacy STO	Surface Wa	Ground Wa	Pipe Indica
Illinois	Stark	41.01833	89.83528	7130005	/TYPA/AMIS			
Illinois	Stark	41.01833	89.83528	7130005	/TYPA/AMIS			
Illinois	Stark	41.01833	89.83528	7130005	/TYPA/AMIS			
Illinois	Stark	41.01833	89.83528	7130005	/TYPA/AMIS			
Illinois	Stark	41.01833	89.83528	7130005	/TYPA/AMIS			
Illinois	Stark	41.01833	89.83528	7130005	/TYPA/AMIS			
Illinois	Stark	41.01833	89.83528	7130005	/TYPA/AMIS			
Illinois	Stark	41.01833	89.83528	7130005	/TYPA/AMIS			
Illinois	Stark	41.01833	89.83528	7130005	/TYPA/AMIS			
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Illinois	Stark	41.01833	89.83528	7130005 /TYPA/AMIS
Illinois	Stark	41.01833	89.83528	7130005 /TYPA/AMIS
Illinois	Stark	41.01833	89.83528	7130005 /TYPA/AMIS

Sample Co	Start Date	End Date	UMK	Composite	Composite,	Sample De	Start Time	End Time
13158452	22-Jun-93			B			945	0
13158453	12-Aug-93			B			1030	0
13158456	9-Dec-93			B			1030	0
13158466	16-Mar-95			B			1130	0
13158468	20-Jun-95			B			1030	0
13158479	19-Sep-96			B			1030	0
13158488	25-Sep-97			B			1045	0
13158448	21-Jan-93			B			1015	0
13158457	1-Mar-94			B			1130	0
13158463	25-Oct-94			B			945	0
13158473	14-Feb-96			B			1200	0
13158480	22-Oct-96			B			1045	0
13158486	16-Jul-97			B			1030	0
13158490	3-Dec-97			B			945	0
13158496	27-Aug-98			B			1045	0
13158449	18-Feb-93			B			1000	0
13158476	14-May-96			B			1115	0
13158485	5-Jun-97			B			1030	0
13158489	22-Oct-97			B			1030	0
13158497	24-Sep-98			B			1045	0
13158450	30-Mar-93			B			1030	0
13158465	2-Feb-95			B			1130	0
13158470	13-Sep-95			B			1100	0
13158471	29-Sep-95			B			845	0
13158472	29-Nov-95			B			915	0
13158475	10-Apr-96			B			1045	0
13158478	31-Jul-96			B			1030	0
13158482	29-Jan-97			B			1200	0
13158487	4-Sep-97			B			1045	0
13158454	22-Sep-93			B			1045	0
13158483	27-Feb-97			B			1045	0
13158484	26-Mar-97			B			1015	0
13158492	26-Feb-98			B			1045	0
13158495	14-Jul-98			B			1130	0
13158451	13-May-93			B			1100	0
13158458	24-Mar-94			B			1045	0
13158460	6-Jul-94			B			930	0
13158467	16-May-95			B			1030	0
13158469	25-Jul-95			B			1000	0
13158474	14-Mar-96			B			1100	0
13158477	18-Jun-96			B			1130	0
13158493	2-Apr-98			B			1045	0
13158494	13-May-98			B			1030	0
13158498	10-Nov-98			B			1100	0
13158455	10-Nov-93			B			1030	0
13158461	31-Aug-94			B			1130	0

13158464	28-Dec-94	B	1115	0
13158491	27-Jan-98	B	1145	0
13158459	4-May-94	B	930	0
13158462	21-Sep-94	B	1030	0
13158481	10-Dec-96	B	1100	0
13158499	17-Dec-98	B	1115	0

Effluent Mo	Replicate N	Pipe ID	Primary Ac	Secondary	Parameter	Parameter	Result Value	Remark Co
					1022	BORON, TC	10.00	K
					1022	BORON, TC	28.00	
					1022	BORON, TC	14.00	
					1022	BORON, TC	30.00	
					1022	BORON, TC	24.00	
					1022	BORON, TC	71.00	
					1022	BORON, TC	49.00	
					1022	BORON, TC	5.00	K
					1022	BORON, TC	10.00	K
					1022	BORON, TC	87.00	
					1022	BORON, TC	64.00	
					1022	BORON, TC	100.00	
					1022	BORON, TC	54.00	
					1022	BORON, TC	31.00	
					1022	BORON, TC	72.00	
					1022	BORON, TC	5.00	
					1022	BORON, TC	49.00	
					1022	BORON, TC	39.00	
					1022	BORON, TC	43.00	
					1022	BORON, TC	83.00	
					1022	BORON, TC	10.00	K
					1022	BORON, TC	39.00	
					1022	BORON, TC	64.00	
					1022	BORON, TC	71.00	
					1022	BORON, TC	33.00	
					1022	BORON, TC	59.00	
					1022	BORON, TC	51.00	
					1022	BORON, TC	56.00	
					1022	BORON, TC	44.00	
					1022	BORON, TC	10.00	K
					1022	BORON, TC	26.00	
					1022	BORON, TC	32.00	
					1022	BORON, TC	22.00	
					1022	BORON, TC	38.00	
					1022	BORON, TC	10.00	K
					1022	BORON, TC	10.00	K
					1022	BORON, TC	21.00	
					1022	BORON, TC	50.00	K
					1022	BORON, TC	46.00	
					1022	BORON, TC	51.00	
					1022	BORON, TC	27.00	
					1022	BORON, TC	26.00	
					1022	BORON, TC	30.00	
					1022	BORON, TC	38.00	
					1022	BORON, TC	17.00	
					1022	BORON, TC	110.00	

1022	BORON, TC	41.00	
1022	BORON, TC	27.00	
1022	BORON, TC	10.00	K
1022	BORON, TC	140.00	
1022	BORON, TC	76.00	
1022	BORON, TC	31.00	
	Average=	**42.00**	

Highest Summer Result = 140 ug/L

Composite Statistic Code
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CERTIFICATE OF SERVICE

I, the undersigned, hereby certify that I have served the attached **GALVA'S POST-HEARING COMMENTS** and **ADDENDUM TO TESTIMONY OF STEPHEN M. BRUNER**, upon the following:

Mr. John Therriault
Assistant Clerk of the Board
Illinois Pollution Control Board
100 West Randolph Street
Suite 11-500
Chicago, Illinois 60601

via electronic mail on April 30, 2009; and upon:

Bill Richardson, Chief Legal Counsel
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702-1271

Marie E. Tipsord
Hearing Officer
James R. Thompson Center
100 W. Randolph, Suite 11-500
Chicago, IL 60601

Matt Dunn, Chief
Environmental Bureau
Office of the Attorney General
100 W. Randolph, 12th Floor
Chicago, IL 60601

Vera Herst
Assistant Counsel
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 N. Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

by depositing said documents in the United State Mail in Springfield, Illinois on April 30, 2009.

/s/ Claire A. Manning
Claire A. Manning

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Alison K. Hayden
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Springfield, IL 62705
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Fax: (217) 241-3111