March 12, 2025

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mayuri Farlinger
President
Interstate Power and Light Company
200 1st St SE
Cedar Rapids, IA 52401

Registered Agent
Corporation Service Company
505 5th Ave Ste 729
Des Moines, IA 50309

RE: Notice of Violation and Intent to Sue under Clean Water Act § 505, 33 U.S.C. § 1365

Dear Ms. Farlinger:

The Iowa Environmental Council ("IEC"), Environmental Law and Policy Center ("ELPC"), and Sierra Club (collectively, "Notifying Parties") provide the following notice to Interstate Power and Light Company (IPL). In accordance with section 505 of the Clean Water Act ("CWA"), 33 U.S.C. § 1365, and 40 C.F.R. Part 135, Notifying Parties hereby give notice of the violations more particularly described below. If these violations are not permanently terminated and the environmental damage caused by the violations is not remedied within 60 days, the Notifying Parties intend to commence a civil action against Interstate Power & Light Company seeking abatement of the violations, penalties, mitigation of damages caused by the violations, attorneys fees and costs, pursuant to section 505 of the Act.

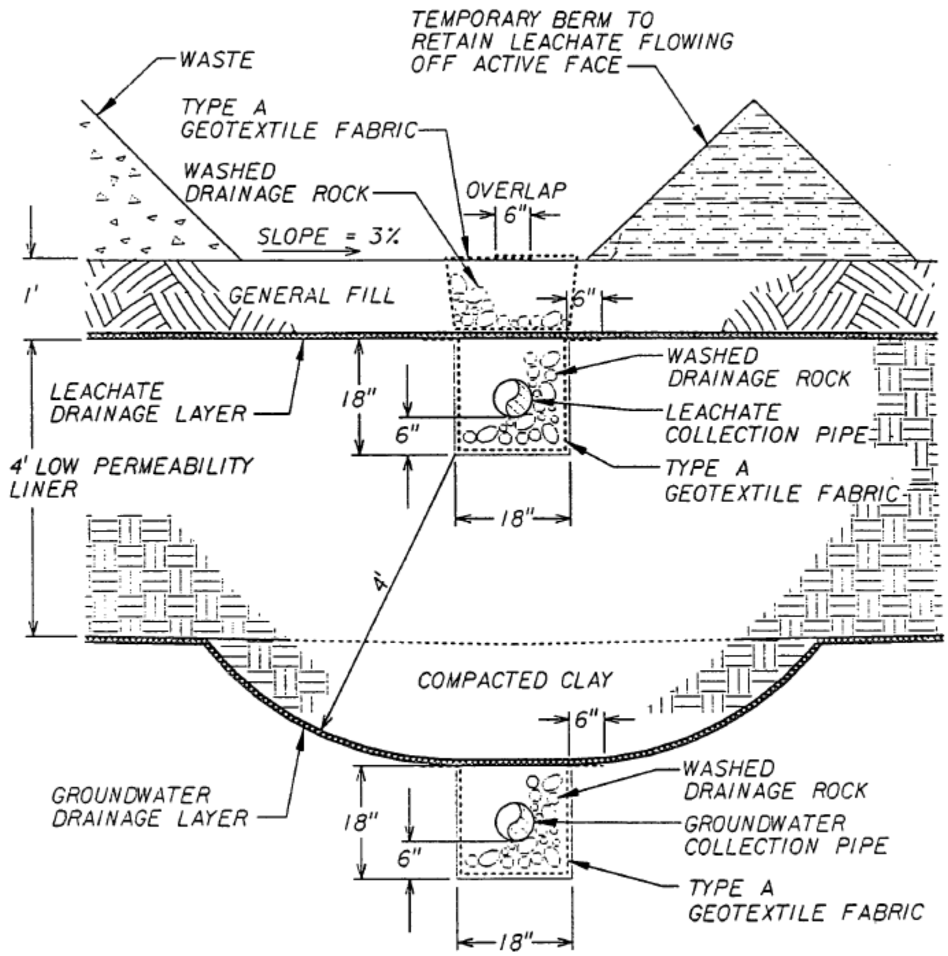
I. The Clean Water Act

Section 301(a) of the CWA, 33 U.S.C. § 1311(a), prohibits the discharge of pollutants by any person except in compliance with a permit. *See also* 40 C.F.R. § 122.41. Noncompliance with discharge permit requirements constitutes a violation of the CWA. 33 U.S.C. § 1365(a)(1). *See* 40 C.F.R. § 122.41(a). Violations of the requirement to obtain a permit and violations of permit requirements are subject to penalties of up to $66,712 per day. *Id.* §§ 19.4, 122.41(a)(2). Citizens may sue any person who violates an effluent standard or limitation, including requirements of section 1311. 33 U.S.C. § 1365(a)(1), (f)(1).

II. Factual Background

IPL has used a coal ash landfill for the Ottumwa coal plant since 1995. As part of the design, IPL lowered the groundwater at the site by installing piping below the liner of the coal ash waste. The piping is called an "underdrain" because it removes groundwater below the liner, which should have no contact with the leachate above the liner.[1]

Figure 1. Cross-Section of Ottumwa Midland Landfill.[2]

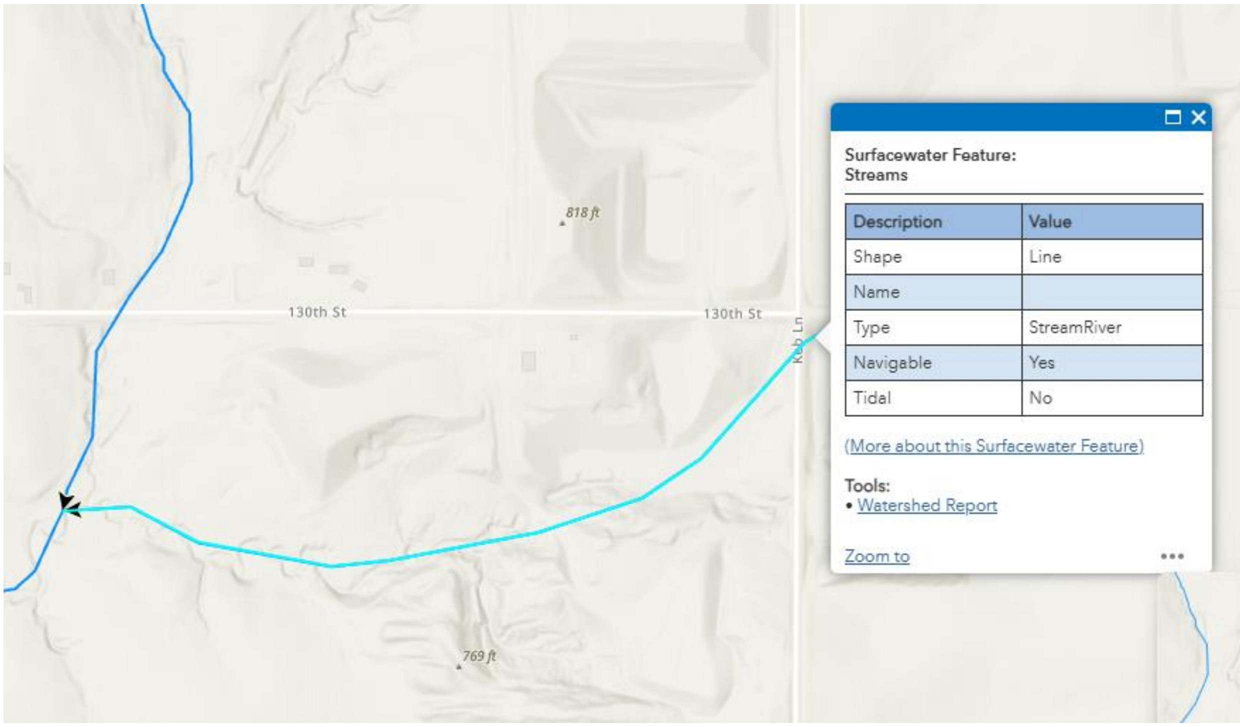


[1] Leachate is the liquid that drains out of, or percolates through, landfills or surface impoundments containing coal ash or other coal plant wastes. 89 Fed. Reg. 40292 (May 9, 2024). It contains the same kinds of toxic pollutants and heavy metals found in coal ash itself, including but not limited to mercury, arsenic, selenium, manganese, cobalt, lithium, and other pollutants, prolonged exposure to which can damage the kidneys, liver, and nervous and circulatory systems. *Id*. at 40473; *see also* EPA, Technical Development Document for Final Supplement Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, at 68 (Tbl. 18), 70 (Tbl. 19), 73 (Tbl. 20) (Apr. 2024); EPA Doc. No. EPA-HQ-OW-2009-0819-10337.

[2] Solid Waste Permit 90-SDP-8-92P, Construction Certification Report filed July 11, 1995, at Appendix A (Montgomery Watson, Apr. 4, 1995), available at https://programs.iowadnr.gov/solidwaste/OpenText/DownloadDocument/59283.

IPL pumps the groundwater at a rate up to 84,000 gallons per day[3] and discharges it through a point source to an area IPL characterizes as a wetland,[4] which flows to an unnamed creek that enters the Des Moines River north of Ottumwa. The wetland is hydrologically connected to a "navigable water," which is a "water of the United States." EPA's WATERS GeoViewer website lists the unnamed creek as "navigable."[5] The mouth of the unnamed creek is upstream from the City of Ottumwa's drinking water intake on the Des Moines River.

Figure 2. EPA WATERS GeoViewer screenshot of unnamed creek receiving discharge.



The Clean Water Act requires permits for discharges of pollutants. 33 U.S.C. § 1342. IPL applied for the undrain water to be covered under Iowa Department of Natural Resources (IDNR) Stormwater General Permit number 1, and received initial approval from the IDNR on October 1, 1994.[6] As a condition of coverage under Stormwater General Permit 1, the section titled Prohibition on Non-Stormwater Discharges states: "all discharges covered by this permit

[3] Attachment 1, "Antidegradation Alternatives Analysis Interstate Power and Light Ottumwa Generating Station," HR Green, Inc. (Dec. 16, 2024), at 3.
[4] Ottumwa's underdrain and pump system is "a discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, . . . from which pollutants are or may be discharged." 33 U.S.C. 1362(14); 40 C.F.R. § 122.2.
[5] https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=074cfede236341b6a1e03779c2bd0692 (last visited Mar. 11, 2025).
[6] IDNR's activity log shows authorization was granted on July 10, 1995. See https://programs.iowadnr.gov/stormwater/pages/activityLog?permitID=4670 (last visited Mar. 11, 2025).

shall be composed *entirely* of storm water *except* as follows:… *uncontaminated groundwater*…" (emphasis added).[7]

IPL did not report water quality monitoring data under the Stormwater General Permit.[8] However, it did report monitoring data for underdrain discharges under the solid waste permit for the landfill. The monitoring data in IPL's annual water quality report for the solid waste permit demonstrates the discharges from GU-1 and GU-EX (each measuring underdrain water) contain arsenic, barium, boron, calcium, cobalt, iron, lithium, magnesium, manganese, molybdenum, zinc, and other pollutants below reporting limits, as shown in figures 3 and 4 below.[9] Thus, the underdrain water is contaminated and is not an allowed discharge under Stormwater General Permit 1.

[7] IDNR, General Permit 1, Part III(A). Available at https://www.iowadnr.gov/media/7289/download?inline.
[8] "Stormwater – Monitoring Data." IDNR. Available at https://programs.iowadnr.gov/stormwater/pages/monitoringData?permitID=4670 (last visited Mar. 11, 2025) (showing no discharge).
[9] Alliant Energy, 2024 Annual Water Quality Report, at pages 43 and 437, available at https://programs.iowadnr.gov/solidwaste/OpenText/DownloadDocument/111409.

Figure 3. 2024 Water Quality Report for Solid Waste Permit 90-SDP-08-92, Table 11.

Table 11
Data Analytical Summary - Additional Points
2024 Annual Water Quality Report
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

CHEMICAL PARAMETER	GWPS	GWPS SOURCE	EVENT	GU-1 TEMP	GU-2	GU-EX	LP-1	SW-1R	SW-2R	SW-3	SW-4	SW-5	LEACHATE BASIN	TCB-1/2
ARSENIC, µg/L	10	MCL	2024-Aug	<0.53		0.70 J				2.0			9.7	0.95 J
BARIUM, µg/L	2,000	MCL	2024-Aug	38		35				52			72	76
BERYLLIUM, µg/L	4	MCL	2024-Aug	<0.33		<0.33				<0.33			<0.33	<0.33
BORON, µg/L	6,000	SWS	2024-Aug	270		900				560			2,100	430
CALCIUM, mg/L	--	--	2024-Aug	230		150				61			260	130
COBALT, µg/L	2.1	SWS	2024-Aug	11		3.5				0.20 J			0.68	<0.17
COPPER, µg/L	1,300	SWS	2024-Aug	<1.8		<1.8				<1.8			<1.8	<1.8
FLUORIDE, mg/L	4	MCL	2024-Aug	0.42 J		0.46 J				<0.38			<0.38	<0.38
IRON, µg/L	--	--	2024-Aug	<36		260				76 J			<36	<36
LEAD, µg/L	15	SWS	2024-Aug	<0.26		<0.26				<0.26			<0.26	<0.26
LITHIUM, µg/L	14	SWS	2024-Aug	48		26				8.7 J			43	3.3 J
MAGNESIUM, µg/L	--	--	2024-Aug	61000		36000				23000			28000	14000
MANGANESE, µg/L	300	SWS	2024-Aug	2000	DRY	250	DRY	DRY	DRY	26	DRY	DRY	86	6.0 J
MOLYBDENUM, µg/L	40	SWS	2024-Aug	2.2		48				9.9			680	3.9
SELENIUM, µg/L	50	MCL	2024-Aug	1.4 J		4.7 J				1.9 J			76	<1.4
ZINC, µg/L	2000	SWS	2024-Aug	29		39				<9.7			<9.7	<9.7
CHLORIDE, mg/L	--	--	2024-Aug	20		32				4.6 J			1000	12
SULFATE, mg/L	--	--	2024-Aug	390		460				250			1,900	380
TOTAL DISSOLVED SOLIDS, mg/L	--	--	2024-Aug	1100		930				410			5,000	590
TOTAL SUSPENDED SOLIDS, mg/L	--	--	2024-Aug	<1.4		2.5				8.3			6.0	3.9
pH, SU	--	--	2024-Aug	6.73		7.70				8.56			8.60	8.06
TEMPERATURE, DEGREES C	--	--	2024-Aug	20.7		23.3				28.1			25.8	28.3
DISSOLVED OXYGEN	--	--	2024-Aug	6.66		7.22				8.94			12.64	8.39
OXIDATION REDUCTION POTENTIAL	--	--	2024-Aug	83.1		56.2				18.0			63.7	71.9
SPECIFIC CONDUCTANCE, UMHOS/CM	--	--	2024-Aug	1438		1281				651			6,769	863

NOTES:
MCL = Maximum Contaminant Level
SWS = Statewide Standard for Groundwater
-- = Not Applicable
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Updated by: LH Date: 9/26/2024
Checked by: RM Date: 11/5/2024

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Figure 4. 2024 Water Quality Report for Solid Waste Permit 90-SDP-08-92, Appendix F.

Appendix F
Additional Points Data History, 2020-Present*
Ottumwa Midland Landfill
Permit No. 90-SDP-8-92P

CHEMICAL PARAMETER	GU-1 TEMP					GU-2					GU-EX					LP-1				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
ARSENIC, UG/L	<0.88	<0.75			<0.53						<0.88	1.9 J	2.2		0.70 J					
BARIUM, UG/L	45	41 B			38						30	25 B	64		35					
BERYLLIUM, UG/L	<0.27	<0.27			<0.33						<0.27	<0.27	<0.27		<0.33					
BORON, UG/L	520	370			270						1,000	1,000	870		900					
CALCIUM, MG/L[1]	--	--			230						--	--	--		150					
COBALT, UG/L	11	14			11						1.3	2.6	4.0		3.5					
COPPER	<1.5	<1.4			<1.8						<1.5	<1.4	7.5		<1.8					
FLUORIDE, MG/L	<0.23	0.47 J			0.42 J						0.30 J	0.76	<0.22		0.46 J					
IRON, UG/L	<50.0	41 J			<36						720	810	6,900		260					
LEAD, UG/L	<0.11	<0.21			<0.26						<0.11	<0.21	1.1		<0.26					
LITHIUM, UG/L[1]	--	--			48						--	--	--		26					
MAGNESIUM, UG/L	70,000	67,000			61000						29,000	38,000	53,000		36000					
MANGANESE, UG/L	3,100	3,000	Too Little Water to Sample	DRY	2000	DRY	DRY	DRY	DRY	DRY	240	530	400	DRY	250	DRY	DRY	DRY	DRY	DRY
MOLYBDENUM, UG/L[1]	--	--			2.2						--	--	--		48					
SELENIUM, UG/L	<1.0	<0.96			1.4 J						<1.0	0.97 J	2.0 J		4.7 J					
ZINC, UG/L	40	35			29						10.0 J	<10	36		39					
CHLORIDE, MG/L	16	17			20						5.5	8.2	15		32					
SULFATE, MG/L	500	460			390						390	440	700		460					
TOTAL DISSOLVED SOLIDS, MG/L	1,200	1,100			1100						750	880	1,200		930					
TOTAL SUSPENDED SOLIDS, MG/L[1]	--	--			<1.4						--	--	--		2.5					
pH, SU	7.03	6.44			6.73						7.16	7.25	6.76		7.7					
TEMPERATURE, DEGREES C	16	15.9			20.7						20.5	19.9	17.8		23.3					
SPECIFIC CONDUCTANCE, UMHOS/CM	1,758	1,615			6.66						1,114	1,298	1,489		7.22					
OXIDATION REDUCTION POTENTIAL, MV[1]	--	--			83.1						--	--	--		56.2					
DISSOLVED OXYGEN, MG/L[1]	--	--			1438						--	--	--		1281					

NOTES:

1. Parameter added to sampling list in 2023 as part of monitoring program modifications directed by IDNR.
2. Specific conductivity probe was likely not fully submerged in liquid at SW-3 in 2023.

* Historical data through 2019 are included in Appendix C

C:\Users\lhawksworth\AppData\Roaming\Microsoft\Excel\[AWQR_OML_Tables_241104 (version 1).xlsb]Appendix F_Add. Points History

Updated: LH, 9/26/2024
Checked: RM, 11/5/2024

The table below shows the calculated potential annual quantity of toxics and pollutants proposed to be discharged into the Des Moines River, based on the Ottumwa Midland Landfill monitoring data above and the maximum daily pumping capacity.[10]

Figure 5. Calculation of potential pollution discharges.

Based on 84,000 gallons per day (30,660,000 gallons per year)							
Conversion Factors:	1 gallon = 3.78541178 Liters						
	1 mg = 0.0000022046 lbs						
Highlighted rows: (yellow)	**toxics identified by the World Health Organization, and ELG POC's**						
Highlighted rows: (blue)	**Analytes above groundwater protection stantards**						
Analyte	**2020-2024**			**Highest**	**Maximum**		
	GU1	**GU-EX**	**GWPS**	**mg/L**	**Liters/year**	**mg**	**lbs**
ARSENIC, UG/L	<0.88	2.20		0.0022	116,060,725	255,334	0.56
BARIUM, UG/L	45.00	64.00		0.064	116,060,725	7,427,886	16.38
BERYLLIUM, UG/L	<0.33	<0.33		0.0003	116,060,725	38,300	0.08
BORON, UG/L	520.00	1000.00		1	116,060,725	116,060,725	255.87
CALCIUM, MG/L(1)	230.00	150.00		230	116,060,725	26,693,966,790	58,849.52
COBALT, UG/L	14.00	4.00	2.1 UG/L	0.014	116,060,725	1,624,850	3.58
COPPER	<1.8	7.50		0.0075	116,060,725	870,455	1.92
FLUORIDE, MG/L	0.47	0.76		0.76	116,060,725	88,206,151	194.46
IRON, UG/L	41.00	6900.00		6.9	116,060,725	800,819,004	1,765.49
LEAD, UG/L	<0.26	1.10		0.0011	116,060,725	127,667	0.28
LITHIUM, UG/L(1)	48.00	26.00	14 UG/L	0.048	116,060,725	5,570,915	12.28
MAGNESIUM, UG/L	67000.00	53000.00		67	116,060,725	7,776,068,587	17,143.12
MANGANESE, UG/L	2000.00	400.00	300 UG/L	2.000	116,060,725	232,121,450	511.73
MOLYBDENUM, UG/L(1)	2.20	48.00	40 UG/L	0.048	116,060,725	5,570,915	12.28
SELENIUM, UG/L	1.40	4.70		0.005	116,060,725	545,485	1.20
ZINC, UG/L	40.00	39.00		0.04	116,060,725	4,642,429	10.23
CHLORIDE, MG/L	20.00	32.00		32	116,060,725	3,713,943,206	8,187.76
SULFATE, MG/L	500.00	700.00		700.00	116,060,725	81,242,507,622	179,107.23
TOTAL DISSOLVED SOLIDS, MG/L	1200.00	1200.00		1,200.00	116,060,725	139,272,870,210	307,040.97
TOTAL SUSPENDED SOLIDS, MG/L(1)	<1.4	2.50		0.0025	116,060,725	290,152	0.64

This represents the potential unpermitted discharge of over 573,000 pounds of untreated pollutants per year being discharged from the Ottumwa Midland Landfill to the Des Moines River. It includes four pollutants (Cobalt, Lithium, Manganese, and Molybdenum) above

[10] Calculated by IEC using data from Alliant Energy, 2024 Annual Water Quality Report, at pages 43 and 437, available at https://programs.iowadnr.gov/solidwaste/OpenText/DownloadDocument/111409.

groundwater protection standards.[11] These discharges of pollutants without permit authorization violate the Clean Water Act.

In addition to violating the Clean Water Act, the concentrations of pollutants in the discharge exceed water quality standards for drinking water. The Des Moines River downstream of the discharge is designated Class C, which means the water is a drinking water source protected for human health uses.[12] The maximum arsenic concentration in the underdrain discharge, according to IPL's water quality monitoring report, is 2.2 ug/L.[13] The water quality standard for arsenic in a drinking water source to protect human health is 0.18 ug/L.[14] Thus, the underdrain water has exceeded the downstream water quality standard by more than ten times.

By the terms of the stormwater general permit, "When the Department notifies a discharger to apply for an individual permit a deadline, not longer than one year, will be established for submitting the application."[15] According to an email from Matthew Bizjack, Senior Environmental Specialist for Alliant Energy (IPL's parent company), IDNR met with IPL on Wednesday, August 23, 2023 regarding the underdrain discharge from the facility.[16] IPL agreed to "install[] a method of managing the discharge" from the system. As noted in an antidegradation alternatives analysis ("AAA") performed for Alliant, "The Iowa Department of Natural Resources (DNR) has communicated to Interstate Power and Light (IPL) that landfill underdrain water does not meet the definition of 'uncontaminated groundwater' as defined in NPDES General Permit No. 1."[17]

As discussed, IPL is discharging pollutants from the Ottumwa underdrain to a water of the United States, but has not submitted a permit application for the discharge. Thus, upon information and belief, IPL has been discharging, and continues to discharge, pollutants into waters of the United States without permit authorization since August 2024, in violation of the Clean Water Act, 33 U.S.C. § 1311(a), and 40 C.F.R. § 122.41(a).

In response to IDNR communication in 2023 to seek an individual National Discharge Pollution Elimination System (NPDES) permit for the OML underdrain water, IPL contracted with HR Green, Inc. to conduct an antidegradation alternatives analysis, which was publicly noticed on December 19, 2024. In the analysis, the preferred alternative was to build a pipe from the landfill to the Des Moines River to discharge the water without treatment. IEC submitted comments on the AAA on January 17.

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[11] *Id.* at 43. The groundwater protection standards are based on statewide standards for groundwater or maximum contaminant levels under the Safe Drinking Water Act.

[12] Antidegradation Alternatives Analysis at Appendix A, p. 3. *See* Iowa DNR, Des Moines River IA 04-LDM-1011, ADBNet, available at https://programs.iowadnr.gov/adbnet/Segments/1011 (identifying the segment of the Des Moines River at the point of the potential discharge as Class C with human health designated uses).

[13] Alliant Energy, 2024 Annual Water Quality Report, at pages 43 and 437, available at https://programs.iowadnr.gov/solidwaste/OpenText/DownloadDocument/111409.

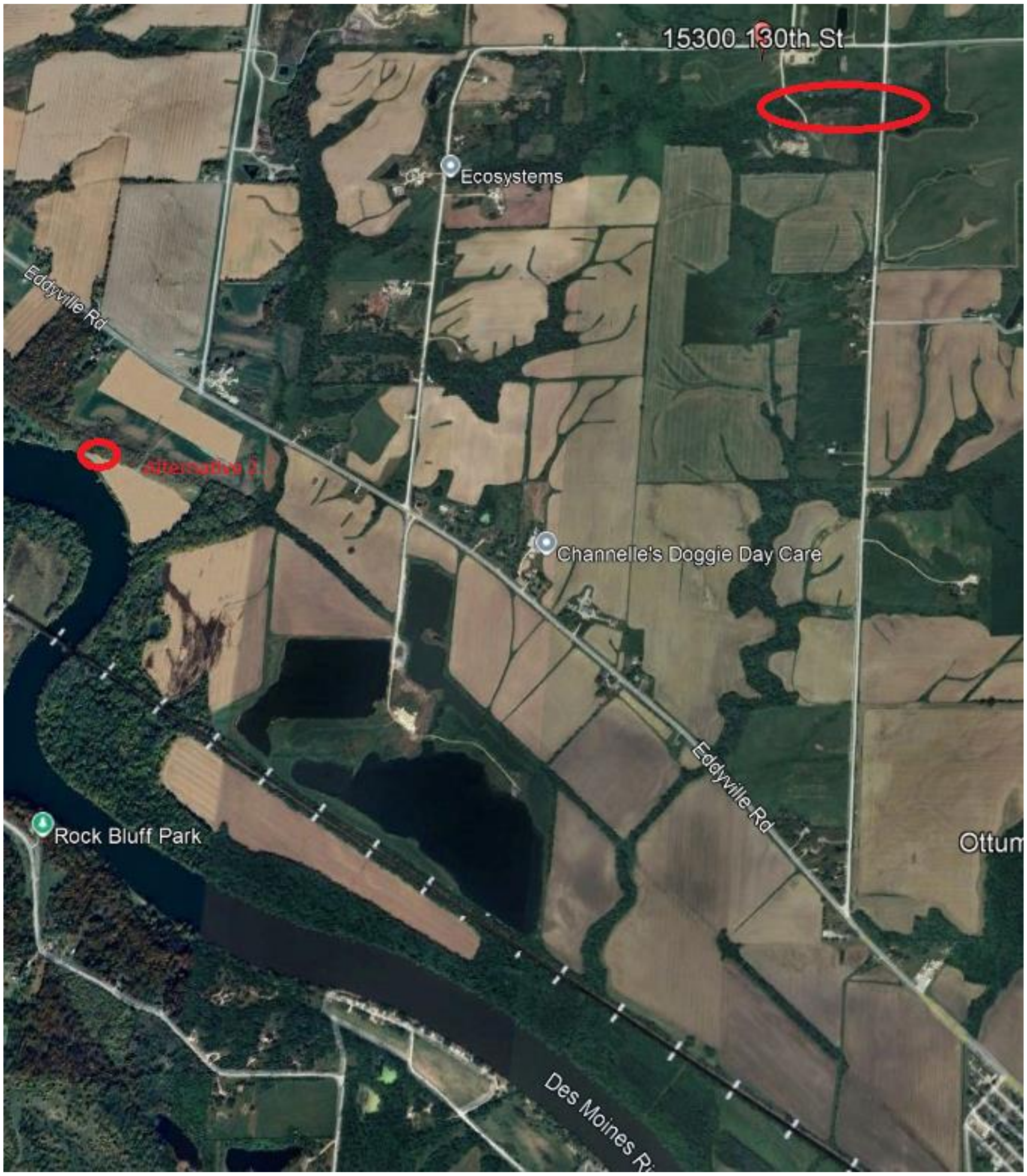
[14] Iowa Admin. Code r. 567-61.3 Table 1.

[15] Iowa DNR, General Permit 1, Part 1(C). Available at https://www.iowadnr.gov/media/7289/download?inline.

[16] *See* Attachment 2, email from Matthew Bizjack to Ryan Stouder (Iowa DNR) et al., Sept. 6, 2023.

[17] AAA at 1.

Figure 6. Map of Ottumwa Midland Landfill (top right) and proposed discharge location (left).



The Ottumwa Midland Landfill was built 30 years ago and included variances during construction related to drainage.[18] The underdrain discharges contain many of the same pollutants as combustion residual leachate. If any of the leachate water is reaching the underdrain system, the discharge from the underdrain would be subject to effluent limit guidelines as unmanaged leachate.[19]

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[18] *See* IDNR Solid Waste Permit No. 90-SDP-08-92, document 66343, available at https://programs.iowadnr.gov/solidwaste/OpenText/DownloadDocument/66343 (variance for alternative drainage geonet).
[19] *See* 40 C.F.R. § 423.11(ff)(2) (unmanaged leachate is leachate that "[h]as leached from a waste management unit into the subsurface and mixed with groundwater prior to being captured and pumped to the surface for discharge directly to WOTUS.").

III. Ongoing Clean Water Act Violation

Notifying Parties provide this notice for the violations outlined above, as well as all ongoing and continuing violations, including those committed subsequent to the date of this notice. This notice is given pursuant to 33 U.S.C. § 1365 and 40 C.F.R. § 135.3(a). If IPL does not cease those violations within 60 days, or obtain permit coverage for the discharges, we intend to bring a citizen suit against IPL under Section 505 of the CWA, 33 U.S.C. § 1365.

Under the CWA, 33 U.S.C. § 1319(d) and 40 C.F.R. § 19.4, each of the violations described herein occurring on or after August 23, 2024, is subject to a penalty of up to $66,712 per day per violation. Thus, IPL is potentially subject to over $12 million in civil penalties. IPL is also potentially subject to injunctive relief, for example, restoring or mitigating the impacts associated with discharging wastewater into the wetland and unnamed creeks since August 23, 2024. Moreover, under 33 U.S.C. § 1365(d), prevailing parties may recover costs of litigation, including attorneys' fees.

IV. Relief to Be Requested

Interstate Power and Light must cease its continuing discharges of pollutants from the Ottumwa coal ash underdrain without a permit, and it must remedy its ongoing discharge of pollutants to waters of the United States.

V. Parties Giving Notice

The Iowa Environmental Council is an alliance of more than 100 organizations, over 500 individual members, and an at-large board of farmers, business owners, and conservationists. IEC works to build a safe, healthy environment and sustainable future for Iowa. Our members care about air and water quality across the state, and they hike, recreate, and enjoy the outdoors in Iowa and beyond.

ELPC is a Midwest-based not-for-profit public interest environmental legal and economic development advocacy organization focused on improving environmental quality, including clean water and healthy clean air, and protecting the Midwest's natural resources. ELPC has members who reside in the State of Iowa and an office in Des Moines.

Sierra Club is a nonprofit organization with more than 620,000 members nationally and approximately 5,200 members in the state of Iowa, many of whom are IPL ratepayers. Sierra Club's mission includes promoting clean energy, and reducing air and water pollution associated with electricity generation. Many Sierra Club members in Iowa are IPL customers who have a strong interest in receiving reliable power that is generated and supplied in a cost-effective and environmentally sound manner.

VI. Conclusion

As discussed above, if IPL fails to come into compliance with the Clean Water Act, 33 U.S.C. § 1311(a), within 60 days, the Notifying Parties intend to file a citizen suit under Section 505(a)(1) of the Clean Water Act seeking civil penalties and injunctive relief. If IPL has taken any steps to abate the violations described above, or if IPL believes that anything in this letter is inaccurate, please let us know. If IPL does not advise us of any remedial steps or inaccuracies during the 60-day period, we will assume that no such steps have been taken, that the information in this letter is accurate, and that violations are likely to continue. We would be happy to meet with IPL or its representatives to attempt to resolve these issues within the 60-day notice period.

Any correspondence related to this matter should be directed to the following attorneys for the notifying groups listed as signatories below.

Sincerely,

/s/ Steve Guyer

Steve Guyer
Senior Energy Policy Counsel
Iowa Environmental Council
505 5th Ave, Ste 850
Des Moines, IA 50309
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/s/ Michael Schmidt

Michael Schmidt
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/s/ Joshua Smith

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/s/ Josh Mandelbaum

Josh Mandelbaum
Senior Attorney
Environmental Law & Policy Center
505 5th Ave, Ste 333
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cc (via certified mail):

Director Kayla Lyon
Iowa Department of Natural Resources
6200 Park Avenue, Suite 200
Des Moines, IA 50321

Regional Administrator Jim Macy
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, KS 66219

U.S. Attorney General Pamela Bondi
U.S. Department of Justice
950 Pennsylvania Avenue, N.W.
Washington, DC 20530-0001

Administrator Lee Zeldin
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Mail Code 1101A

ATTACHMENT 1

Ottumwa-Midland Landfill
Underdrain Outfall Relocation

Antidegradation Alternatives Analysis

December 16, 2024

HR Green Project No: 2402268

Prepared For: Alliant Energy – Interstate Power and Light Company

Professional Engineering Certification

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Date:__________

MATTHEW J. WILDMAN, P.E.

License No. **17910**

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1.0 EXECUTIVE SUMMARY

The Ottumwa-Midland Landfill (OML) utilizes an underdrain tiling system to lower the groundwater table beneath the landfill's bottom liner to achieve the required separation between the waste and groundwater table. Groundwater collected by the underdrain system (consisting solely of background groundwater) is currently directed to an Unnamed Creek, a tributary to the Des Moines River. The facility discharges stormwater under the National Pollutant Discharge Elimination System (NPDES) General Permit No. 1, "Stormwater Discharge Associated with Industrial Activity". The Iowa Department of Natural Resources (DNR) has communicated to Interstate Power and Light (IPL) that landfill underdrain water does not meet the definition of "uncontaminated groundwater" as defined in NPDES General Permit No. 1.

IPL desires to relocate the discharge point of the underdrain system to the Des Moines River, approximately three miles from the current outfall, and permit the discharge under an individual NPDES permit. Relocation of the outfall requires an Antidegradation Alternatives Analysis to be submitted to the DNR to ensure that the beneficial uses of the receiving stream are not degraded.

This Antidegradation Alternatives Analysis considers three alternatives, with varying scales of degradation, that will allow IPL to discharge water from the underdrain system in the most practical and least degrading manner.

1. Non-Degrading Alternative (NDA) – Continue to Discharge to Unnamed Creek
2. Base Pollution Control Alternative (BPCA) – Reroute Discharge to the Des Moines River
3. Less Degrading Alternative (LDA) – Implement Iron and Manganese Treatment Upstream of the Existing Outfall

Each alternative was evaluated based on its practicality, economic efficiency, and level of degradation to the receiving stream. Alternative 1, Continue to Discharge to Unnamed Creek, is considered impractical because the discharge would periodically exceed the waste load allocation limits for iron and manganese in the Unnamed Creek. Alternative 3, Implement Iron and Manganese Treatment Upstream of the Existing Outfall, would reduce degradation to the receiving stream. However, Alternative 3 is considered economically inefficient and unreasonable based on its life cycle cost and considering that the treatment would need to be continued in perpetuity (i.e., beyond the 30-year post-closure period following the active life of the landfill), resulting in continuous operational/maintenance expenses and major plant upgrades approximately every 20 years.

The preferred alternative is Alternative 2, Reroute Discharge to the Des Moines River. This alternative will prevent unnecessary costly treatment of background groundwater while allowing the continued operation of the landfill underdrainage system. Alternative 2 requires minimal operation and maintenance, which is ideal in this situation due to the long-term needs of the landfill and associated underdrain system. Historical water quality data indicates that the underdrain discharge is capable of complying with the WLA limits for the proposed outfall and the beneficial uses of the Des Moines River will be maintained.

2.0 INTRODUCTION

2.1 EXISTING TREATMENT FACILITIES

The OML is a coal combustion residual (CCR) landfill located in Wapello County, near Ottumwa, Iowa. The landfill consists of the existing landfill area, constructed in 1995, and a multi-phase expansion known as the North Expansion, with Phase 1 completed in 2015. The underdrain system in the existing landfill area is referred to as "GU-EX". The North Expansion Phase 1 and Phase 2 underdrain systems are referred to as "GU-1 Temp" and "GU-2 Temp", respectively. Refer to Figure 1 for a process flow diagram associated with the existing underdrain system.

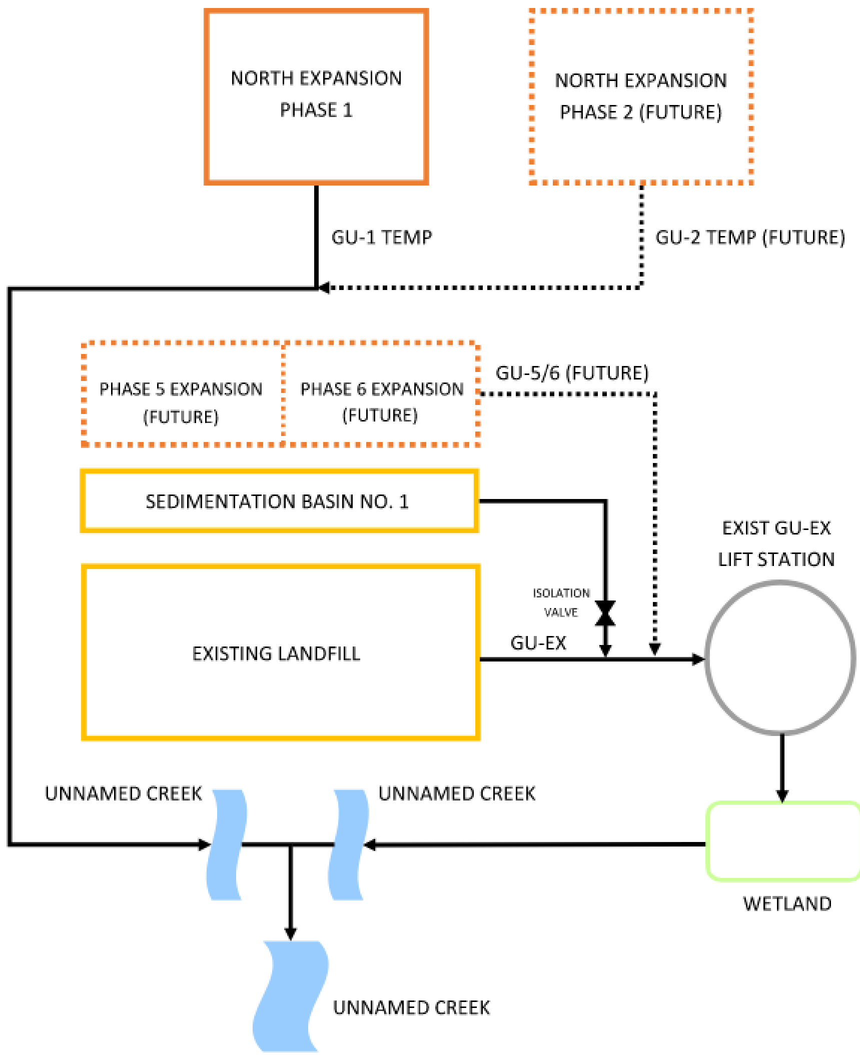


FIGURE 1: EXISTING SYSTEM PROCESS FLOW DIAGRAM

The landfill underdrain system consists of perforated piping encased in coarse aggregate and geotextile fabric. A clay layer separates the underdrain piping from the leachate collection pipe above. Leachate is collected and diverted into a lined pond, where it is hauled off-site on a regular basis. Groundwater from the underdrain system serving the Existing Phase combines with stormwater runoff from Sedimentation

Basin No. 1. Existing valving in place allows for the independent streams to be isolated, if necessary. Water collected from the Existing Phase underdrain and sedimentation basin flows by gravity to a lift station and is pumped to a nearby wetland that ultimately flows to an Unnamed Creek. Groundwater from the underdrain serving Phase 1 Expansion discharges via gravity to an Unnamed Creek. Both Unnamed Creeks combine into an Unnamed Creek shortly downstream of each discharge point.

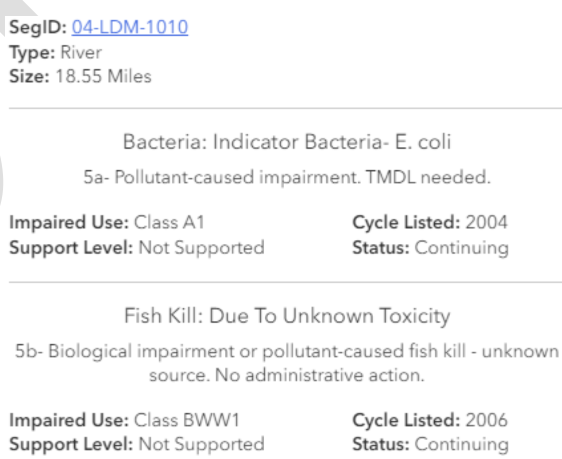
Underdrains from future expansion areas Phases 2 through 6 have been permitted by the Iowa DNR for future construction. The combined flow from current and potential future underdrain flows are calculated to be approximately 1,400 to 84,000 gallons per day (gpd) of underdrain water.

2.2 RECEIVING STREAM CONSIDERATIONS

The underdrain system currently discharges to two Unnamed Creeks, which combine into an Unnamed Creek shortly downstream of the discharge points and eventually reach the Des Moines River. The Unnamed Creek is classified as an A1, B(WW-1) water way, with a 0 cubic feet per second (cfs) annual critical low flow at the Existing Phase outfall location of 41° 4’ 47.15” N, 92° 27’ 11.11” W. The designated use of A1, B(WW-1) is automatically assigned because the Unnamed Creek does not have a Field Use Attainability Assessment (UAA) at the existing outfall location.

The Unnamed Creek combines with the Des Moines River approximately 2.9 miles downstream of the outfall location. The Des Moines River is classified as an A1, B(WW-1, HH) water way, with a 7Q10 annual critical low flow of 271 cfs at the mouth of Unnamed Creek. Class A1 waters are protected for primary contact where significant ingestion of the water is likely. Class B(WW-1) waters are suitable to maintain warm water fish populations with a resident aquatic community, including a variety of nongame fish and invertebrate species. HH waters contain fish that are routinely harvested for human consumption or waters that are designated as a drinking water supply.

The proposed outfall is located along a 32.6 mile stretch of the Des Moines River (Segment Code 04-LDM-1011) that is considered impaired for nitrate plus nitrite. This segment is currently pending EPA approval and will be incorporated into the Iowa DNR’s 2024 Integrated Report. According to the Iowa ADBNet database and 2022 EPA approved assessments, the Des Moines River is currently impaired approximately 4.5 miles downstream of the proposed Des Moines River outfall location for bacteria and a fish kill due to unknown toxicity (Segment Code 04-LDM-1010). Refer to Figure 2 for additional details. There are no approved or scheduled Total Maximum Daily Loads (TMDLs) along the discharge path at this time.


SegID: 04-LDM-1010
Type: River
Size: 18.55 Miles

Bacteria: Indicator Bacteria- E. coli

5a- Pollutant-caused impairment. TMDL needed.

Impaired Use: Class A1 **Cycle Listed:** 2004
Support Level: Not Supported **Status:** Continuing

Fish Kill: Due To Unknown Toxicity

5b- Biological impairment or pollutant-caused fish kill - unknown source. No administrative action.

Impaired Use: Class BWW1 **Cycle Listed:** 2006
Support Level: Not Supported **Status:** Continuing

FIGURE 2: ADBNET 2022 IMPAIRED WATERS – DES MOINES RIVER

2.3 EFFLUENT LIMITATIONS

A WLA was prepared on December 13, 2024 by the Iowa DNR for the proposed outfall location at the Des Moines River. A summary of the proposed WLA limits is provided in Table 1. The full WLA is provided in Appendix A.

TABLE 1: WLA LIMITS FOR PROPOSED DES MOINES RIVER OUTFALL

Parameter	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
$cBOD_5$	-	7,739,579	-	90,400
COD	-	9,719,650	-	113,528
Total DO (Jan – Dec)	Minimum Concentration (mg/l) – WQBL Not Required			
Ammonia - Nitrogen				
January	17,158	17,158	211	211
February	20,618	20,618	251	251
March	16,910	16,910	208	208
April	11,609	11,609	148	148
May	14,112	14,112	176	176
June	14,136	14,136	176	176
July	14,140	14,140	179	179
August	14,138	14,138	178	178
September	11,635	11,635	149	149
October	11,634	11,634	148	148
November	11,632	11,632	147	147
December	11,609	11,609	148	148
Chloride	1,472,364	1,472,364	17,625	17,625
Sulfate	3,590,702	3,590,702	42,968	42,968
pH	3.8-14.0 Standard Units			
Toxics	Refer to Appendix A for full list of Toxics Limits			
Iron	2,475	2,475	29.59	29.59
Manganese	8,381	8,381	100.2	100.2

3.0 DESIGN CONDITIONS

3.1 DESIGN WASTEWATER CHARACTERISTICS

The combined flow from current and potential future underdrain flows are calculated to be approximately 1,400 to 84,000 gpd of underdrain water. Historical water quality data indicates that the underdrain discharge would periodically exceed limits for the Unnamed Creek. Iron and manganese data from regular annual water quality monitoring of the underdrain water is summarized in Table 2. Note that the concentrations represent the maximum value recorded in the data set.

Iron and manganese concentrations from the underdrain discharge have historically been below the proposed WLA limits for the Des Moines River. Furthermore, the maximum combined underdrain discharge of 84,000 gpd will amount to 0.05% of the Des Moines River 7Q10 annual critical low flow of 271 cfs at the proposed outfall location.

TABLE 2: UNDERDRAIN WATER QUALITY DATA (MAXIMUM HISTORICAL DATA POINT)

Underdrain System	Maximum Theoretical Flow Rate (gpd)	Total Iron (mg/L)	Manganese (mg/L)
GU-1 Temp.	11,600	0.14	5.5
GU-EX	50,400	6.9	1.0
GU-2 Temp. (Future)	14,600	0.51	3.9
Phase 5/6 (Future)	6,400	N/A	N/A

3.2 POC IDENTIFICATION AND TIER PROTECTION LEVEL

Pollutants of Concern (POCs) for the underdrain operation are listed in Table 3 and include all parameters that have a reasonable potential to be present in the underdrain water and are currently sampled for compliance monitoring. In general, the primary source of degradation is from iron and manganese, due to the elevated concentrations in recent water samples.

TABLE 3: POLLUTANTS OF CONCERN

POC	Secondary or WQBEL	Beneficial Use Affected	Tier
$cBOD_5$	Yes	Aquatic Life	2
COD	Yes	Aquatic Life	2
Ammonia	Yes	Aquatic Life	2
Bacteria	Yes	Contact Recreation	2
Chloride	Yes	Aquatic Life	2
Sulfate	Yes	Aquatic Life	2
pH	Yes	Human Health, Aquatic Life	2
Arsenic	Yes	Human Health, Aquatic Life	2
Barium	Yes	Human Health, Aquatic Life	2
Beryllium	Yes	Human Health, Aquatic Life	2
Boron	Yes	Human Health, Aquatic Life	2
Cadmium	Yes	Human Health, Aquatic Life	2
Calcium	No	Human Health, Aquatic Life	2
Chromium	Yes	Human Health, Aquatic Life	2
Cobalt	Yes	Human Health, Aquatic Life	2
Copper	Yes	Human Health, Aquatic Life	2
Cyanide	Yes	Human Health, Aquatic Life	2
Fluoride	Yes	Human Health, Aquatic Life	2
Iron	Yes	Human Health, Aquatic Life	2

TABLE 3: POLLUTANTS OF CONCERN (CONTINUED)

POC	Secondary or WQBEL	Beneficial Use Affected	Tier
Lead	Yes	Human Health, Aquatic Life	2
Lithium	No	Human Health, Aquatic Life	2
Magnesium	No	Human Health, Aquatic Life	2
Manganese	Yes	Human Health, Aquatic Life	2
Molybdenum	No	Human Health, Aquatic Life	2
Nickel	Yes	Human Health, Aquatic Life	2
Selenium	Yes	Human Health, Aquatic Life	2
Silver	Yes	Human Health, Aquatic Life	2
Thallium	Yes	Human Health, Aquatic Life	2
Total Dissolved Solids	No	Human Health, Aquatic Life	2
Zinc	Yes	Human Health, Aquatic Life	2

4.0 IDENTIFICATION AND DISCUSSION OF ALTERNATIVES

Three alternatives have been evaluated that will allow IPL to discharge water from the underdrain system in the most practical and least degrading manner. The following alternatives are classified as a Non-Degrading Alternative (NDA), Base Pollution Control Alternative (BPCA), and Less Degrading Alternative (LDA). The NDA provides an alternative that will not result in any further degradation to the receiving stream. The LDA provides an option that results in less degradation to the receiving stream in comparison to the BPCA.

4.1 ALTERNATIVE 1: CONTINUE TO DISCHARGE TO UNNAMED CREEK

The first alternative that was evaluated involves the continued operation of discharging the groundwater collected from the underdrain system to the nearby Unnamed Creek. The process flow diagram associated with Alternative 1 is provided in Figure 3 and is identical to the existing process described in Section 2.1.

The facility discharges stormwater under the NPDES General Permit No. 1, “Stormwater Discharge Associated with Industrial Activity”. The Iowa DNR has communicated to IPL that landfill underdrain water does not meet the definition of “uncontaminated groundwater” as defined in NPDES General Permit No. 1. The underdrain water could be permitted as an Individual NPDES Permit and continue to discharge to the Unnamed Creek. However, the underdrain discharge, which consists entirely of background groundwater, would be incapable of consistently complying with NPDES limits for the Unnamed Creek. The beneficial uses of the Unnamed Creek would be degraded because the quality of background groundwater would result in surface water effluent limitation violations, Alternative 1 is therefore considered to be impractical and is not advised.

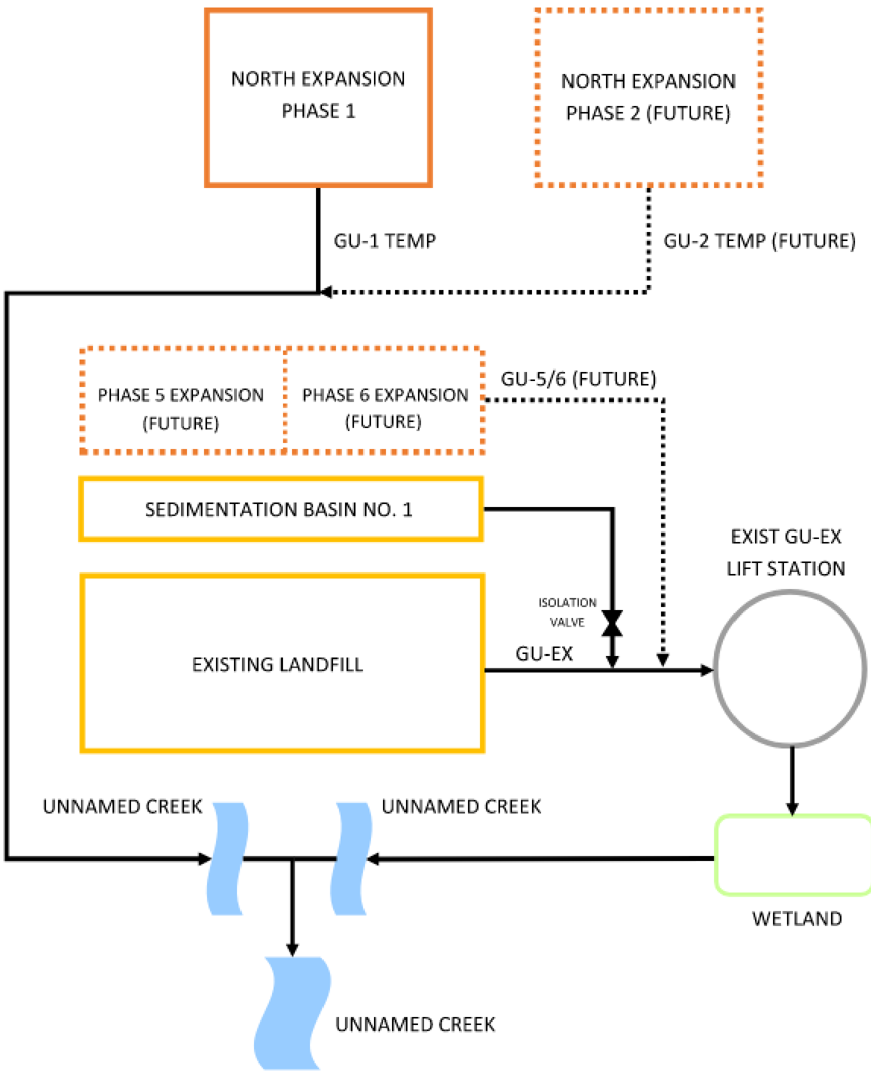


FIGURE 3: ALTERNATIVE 1 (NDA) PROCESS FLOW DIAGRAM

4.2 ALTERNATIVE 2: REROUTE DISCHARGE TO THE DES MOINES RIVER

The second alternative that was evaluated involves discharging water from the underdrain system to a new outfall in the Des Moines River. The process flow diagram associated with Alternative 2 is provided in Figure 4. A location map of the proposed outfall and force main alignment is provided in Appendix B.

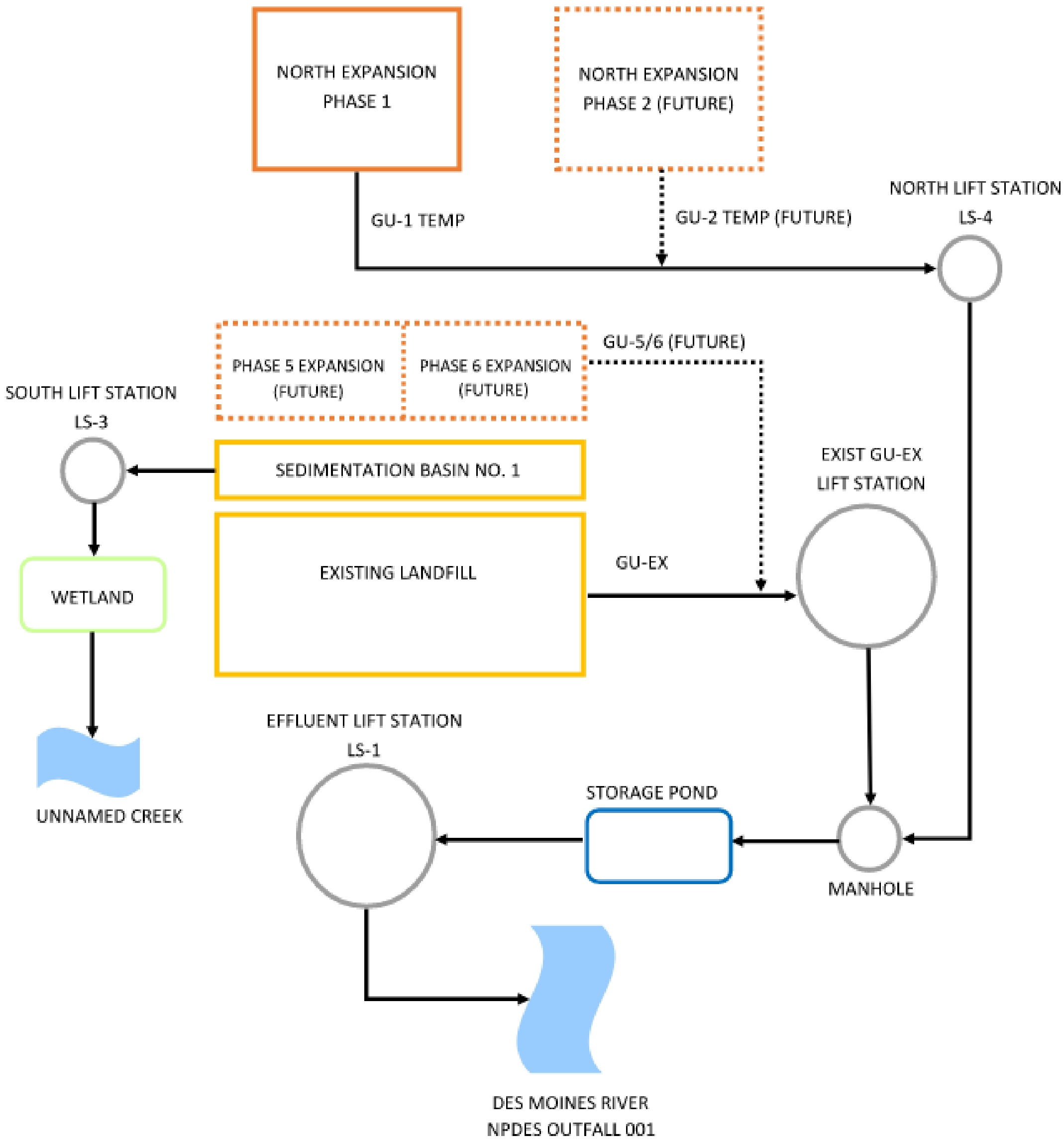


FIGURE 4: ALTERNATIVE 2 (BPCA) PROCESS FLOW DIAGRAM

This alternative will require a new effluent lift station (LS-1) to collect the combined underdrain flow and a lift station (LS-4) to divert the combined Phase 1 and 2 North Expansion underdrain flows to LS-1, in addition to piping/valving provisions between structures. A lift station (LS-3) will also be constructed in a separate project to pump Sedimentation Basin water to the wetland and Unnamed Creek. The combined underdrainage flow will discharge to a storage pond (to accommodate potential periods of future downstream maintenance) prior to discharge. Approximately three miles of 4" HDPE force main will also be required to convey the combined underdrain discharge from LS-1 to Outfall 001.

Capital costs associated with Alternative 2 include furnishing and installing new lift stations, modifications to the existing GU-EX Lift Station, storage pond, site piping and valves between the proposed structures, force main piping from LS-1 to NPDES Outfall 001, together with related subsidiary and incidental work (site restoration, materials testing, construction staking, mobilization, etc.). Operations and maintenance (O&M) costs include labor to operate and maintain the system, maintenance fees and repair work, power consumption associated with the lift station pumps, and replacement parts. The Engineer's Opinion of Probable Construction Cost (OPCC) for Alternative 2 is provided in Table 4. Costs were taken from SCS Engineers' Conceptual Cost Estimate Summary, completed in conjunction with the conceptual design of the proposed Alternative 2 improvements. The 20-year life cycle cost is based on the federal water resources planning discount rate of 2.75% for fiscal year 2024.

TABLE 4: ALTERNATIVE 2 OPCC (BPCA)

Item No.	Item Description	Qty.	Units	Unit Price	Total
1	Lift Station No. 1	1	LS	$485,000	$485,000
2	Lift Station No. 4	1	LS	$85,000	$85,000
3	Site Piping and Valves	1	LS	$175,900	$175,900
4	Storage Pond	1	LS	$842,100	$842,100
5	Force Main to Des Moines River	1	LS	$1,157,400	$1,157,400
				Total Preliminary Opinion of Probable Construction Cost	$2,745,400
				Engineering, Legal, and Administrative	$274,600
				Total Cost + Contingency (20%)	$3,624,000
Annual Cost					
1	Operations & Maintenance	1	PER YR	$31,300	$477,000
				Total 20-Year Life Cycle Cost	**$4,101,000**

4.3 ALTERNATIVE 3: IMPLEMENT IRON AND MANGANESE TREATMENT UPSTREAM OF THE EXISTING OUTFALL

The third alternative that was evaluated involves removing iron and manganese from the underdrain stream via iron and manganese treatment prior to discharging to the existing outfall (Unnamed Creek). Finished water quality would comply with the more stringent iron and manganese limits that are anticipated for the Unnamed Creek. The process flow diagram associated with Alternative 3 is provided in Figure 5.

A small pump station would be installed upstream of an approximate 2'x2' aerator, used to oxidize the iron and manganese prior to filtration. A detention tank would be necessary between the aerator and pressure filters and would be sized to provide 30 minutes of detention time. Two pressure filters, each sized at 3 gpm/ft^2, including filter feed pumps, would be installed downstream of the detention tank. A potassium permanganate feed system would be used to regenerate the filter media (Greensand Plus or equivalent) and would be installed between the aerator and detention tank. The pressure filters and chemical feed system would be installed in a new building (approximately 600 SF). Additional items associated with the new treatment system include process piping and valves, electrical and mechanical equipment, and a generator for backup power.

Similar to Alternative 2, this alternative will require a new effluent lift station (LS-1) to collect the combined underdrain flow, a lift station (LS-4) to divert the combined Phase 1 and 2 North Expansion underdrain flows to LS-1, and piping/valving provisions between structures. The combined underdrainage flow would also discharge to a storage pond prior to iron and manganese treatment. It is assumed that the underdrain flow could discharge by gravity to the Unnamed Creek.

O&M costs include labor to operate and maintain the new treatment system, maintenance fees and repair work, power consumption, chemical costs, and replacement parts. Alternative 3 would need to be continued in perpetuity (i.e., beyond the 30-year post-closure period following the active life of the landfill). Major equipment upgrades and/or replacements would be required every 15-20 years for mechanical components such as the aerator, pumps, chemical feed system, and pressure filters. The Engineer's OPCC for Alternative 3 is provided in Table 5. The 20-year life cycle cost is based on the federal water resources planning discount rate of 2.75% for fiscal year 2024.

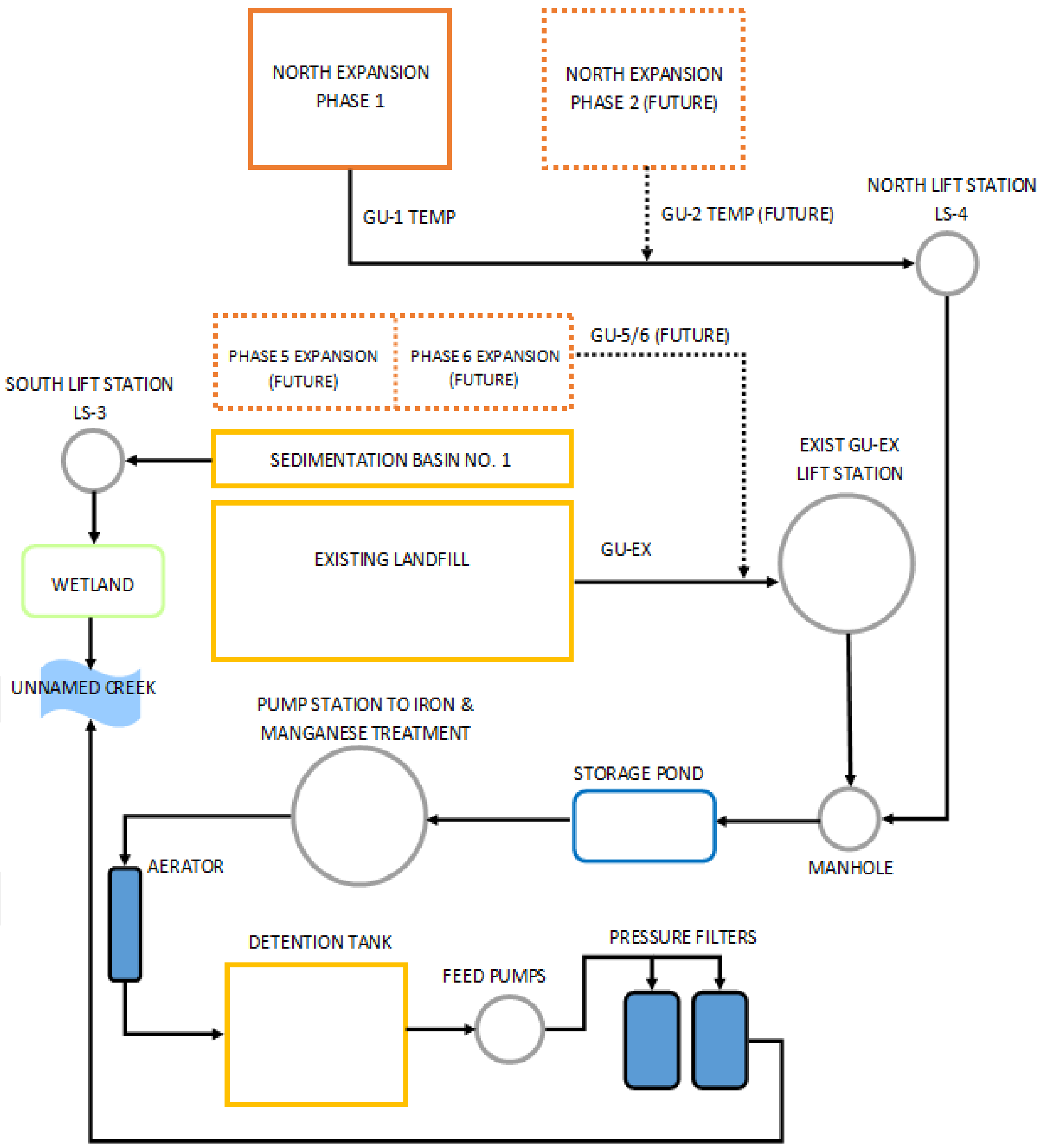


FIGURE 5: ALTERNATIVE 3 (LDA) PROCESS FLOW DIAGRAM

TABLE 5: ALTERNATIVE 3 (LDA) OPCC

Item No.	Item Description	Qty.	Units	Unit Price	Total
1	General Requirements	1	LS	$507,000	$507,000
2	Duplex Pump Station	1	LS	$110,000	$110,000
3	Aerator Treatment System	1	LS	$75,000	$75,000
4	Detention Basin	1	LS	$202,000	$202,000
5	Filter Feed Pumps	1	LS	$75,000	$75,000
6	Pressure Filters	2	EA	$80,000	$160,000
7	Chemical Feed System	1	LS	$25,000	$25,000
8	Process Piping and Valves	1	LS	$150,000	$150,000
9	Electrical and Mechanical	1	LS	$732,900	$732,900
10	Treatment Building	600	SF	$350	$210,000
11	Generator	1	LS	$50,000	$50,000
12	Lift Stations	1	LS	$570,000	$570,000
13	Site Piping and Valves	1	LS	$175,900	$175,900
14	Storage Pond	1	LS	$842,100	$842,100
				Subtotal	$3,884,900
				Contingency (30%)	$1,166,000
				Total Preliminary Opinion of Probable Construction Cost	$5,050,900
				Engineering, Legal, and Administrative (20%)	$1,011,000
Annual Cost					
1	Operations & Maintenance	1	PER YR	$113,500	$1,729,000
				Total Life Cycle Cost	**$7,593,400**

4.4 PRESENT WORTH COSTS

Table 6 summarizes the 20-year present worth costs for each alternative. The present worth costs are based on a federal discount rate of 2.75% for water resources planning in fiscal year 2024.

TABLE 6: PRESENT WORTH COSTS

Alternative	Description	Present Worth Costs
1 (NDA)	Continue to Discharge to Unnamed Creek	N/A
2 (BPCA)	Reroute Discharge to the Des Moines River	$4,101,000
3 (LDA)	Implement Iron and Manganese Treatment Upstream of the Existing Outfall	$7,593,400

The classification and evaluation of each alternative from a practicality and economic standpoint is described below and summarized in Table 7.

- Alternative 1, Continue to Discharge to Unnamed Creek, is considered impractical because the discharge would periodically exceed the waste load allocation limits for iron and manganese in the Unnamed Creek.

Alternative 1 would result in periodic effluent violations and stream degradation and is therefore unreasonable.

- Alternative 2, Reroute Discharge to the Des Moines River, is considered the most economically efficient and practical method to discharge the underdrain water while adhering to WLA limits. Refer to Section 4.5 Preferred Alternative for additional explanation and justification.
- Alternative 3, Implement Iron and Manganese Treatment Upstream of the Existing Outfall, is considered economically inefficient and unreasonable based on its life cycle cost and considering that the treatment would need to be continued in perpetuity (i.e., beyond the 30-year post-closure period following the active life of the landfill), resulting in continuous operational/maintenance expenses and major plant upgrades approximately every 20 years.

TABLE 7: ALTERNATIVES CLASSIFICATION & EVALUATION

Alternative	Practicable?	% of BPCA	Economically Efficient?	Affordable?	Reasonable?
1	No	N/A	N/A	N/A	No
2	Yes	100%	Yes	Yes	Yes
3	Yes	185%	No	No	No

4.5 PREFERRED ALTERNATIVE

The preferred alternative is Alternative 2, Reroute Underdrainage Discharge to the Des Moines River. This alternative will prevent unnecessary costly treatment of background groundwater while allowing the continued operation of the landfill underdrainage system. Historical water quality data indicates that the underdrain discharge is capable of complying with the WLA limits for the proposed outfall and the beneficial uses of the Des Moines River will be maintained. The proposed alignment is included in Appendix B.

Table 8 compares the degradation of the alternatives on a pollutant-by-pollutant basis. Each alternative was evaluated to show the potential degradation to the receiving stream. Alternative 2 will discharge to the Des Moines River while Alternatives 1 and 3 would discharge to the Unnamed Creek.

Zero degradation is assumed for Alternative 1 because the receiving stream would not be subjected to further degradation. However, effluent iron and manganese concentrations will at times exceed the water quality-based effluent limits (WQBELs) for the Unnamed Creek. Iron and manganese concentrations in Alternatives 2 and 3 are both below the WLA limits. Alternative 2 uses the Des Moines River as a new outfall location and will introduce a new pollutant stream, resulting in degradation (although concentrations will be below WLA limits). Alternative 3 will reduce naturally occurring concentrations of iron and manganese in the underdrain water prior to discharging to the Unnamed Creek and is therefore considered less degrading than the current operation and the BPCA. However, any treatment of underdrain water under Alternative 3 would need to continue as long as the landfill contains waste, beyond the 30 year post-closure period following the active life of the landfill.

TABLE 8: RELATIVE DEGRADATION TO RECEIVING STREAM

Pollutant of Concern	Relative Degradation			Comments
	Alternative No.			
	1	2	3	
cBOD$_5$	0	0	0	The listed parameters are not anticipated to be present in levels that will degrade either receiving stream.
COD	0	0	0	
Ammonia	0	0	0	
Bacteria	0	0	0	
Chloride	0	0	0	
Sulfate	0	0	0	
pH	0	0	0	
Arsenic	0	0	0	
Barium	0	0	0	
Beryllium	0	0	0	
Boron	0	0	0	
Cobalt	0	0	0	
Copper	0	0	0	
Fluoride	0	0	0	
Lead	0	0	0	
Magnesium	0	0	0	
Selenium	0	0	0	
Total Dissolved Solids	0	0	0	
Zinc	0	0	0	
Iron	0	+1	-1	Alternative 2 will discharge to a new outfall and result in new degradation to the Des Moines River. Alternative 3 will reduce iron and manganese concentrations prior to discharging to the Unnamed Creek.
Manganese	0	+1	-1	

5.0 JUSTIFICATION OF DEGRADATION

Alternative 2: Reroute Underdrainage Discharge to the Des Moines River, is the most practical and feasible alternative that will allow the continued operation of the landfill underdrainage system and the landfill itself, while preventing unnecessary costly treatment of background groundwater. Historical water quality data indicates that the underdrain discharge is capable of complying with WLA limits for the proposed outfall and the beneficial uses of the Des Moines River will be maintained.

6.0 SOCIAL AND ECONOMIC IMPORTANCE

Social and Economic Importance (SEI) factors for Ottumwa, Iowa, in comparison to the state average, are shown in Table 9. SEI factors for Ottumwa indicate that the local economic and population trends are lower than the average trends for the State of Iowa. This implies that Ottumwa is more susceptible to social and economic disruption than the average town in Iowa. Implementation of the preferred alternative is not anticipated to impact the local community. As a regulated utility, IPL has an obligation to prevent unnecessary increases to energy customer costs. Alternative 2 offers significant cost savings long-term compared to Alternative 3 while minimizing degradation of the receiving stream.

TABLE 9: OTTUMWA SEI FACTORS

Factor	Ottumwa Average	Notes	Source	Iowa Average
Employment Rate	60.5%	Employment Status: Population 16 Years and Older	2022: American Community Survey 5-Year Estimates	64.5%
Unemployment Rate	4.5%	Employment Status: Population 16 Years and Older	2022: American Community Survey 5-Year Estimates	2.0%
Median Household Income	$53,085	Income in the Past 12 Months: Total Households	2022: American Community Survey 5-Year Estimates	$69,855
Poverty Level	19.0%	Poverty Status in the Past 12 Months	2022: American Community Survey 5-Year Estimates	6.8%
Population Trends	+2.0%	Between 2010 and 2020	2010 Census Data and 2020 Census Data	0.46%

7.0 APPENDIX A – WLA FOR PROPOSED DES MOINES RIVER OUTFALL 001

IPL Ottumwa Midland Landfill

This Package Contains

Wasteload Allocation Calculations & Notes

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS

Facility Name: IPL Ottumwa Midland Landfill — NPDES Number: TBD

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 001	**ADW = 0.0014 MGD & AWW = 0.084 MGD**			
CBOD5	—	7,739,579	—	90,400
COD	—	9,719,650	—	113,528
Total D.O.	Minimum Concentration (mg/l)			
January – December	Water Quality Based Limits Are Not Required			
Ammonia – Nitrogen				
January	17,158	17,158	211	211
February	20,618	20,618	251	251
March	16,910	16,910	208	208
April	11,609	11,609	148	148
May	14,112	14,112	176	176
June	14,136	14,136	176	176
July	14,140	14,140	179	179
August	14,138	14,138	178	178
September	11,635	11,635	149	149
October	11,634	11,634	148	148
November	11,632	11,632	147	147
December	11,609	11,609	148	148
Chloride	1,472,364	1,472,364	17,625	17,625
Sulfate	3,590,702	3,590,702	42,968	42,968
pH	3.8-14.0 Standard Units			

Stream Network/Classification of Receiving Stream: Des Moines River (A1 B(WW-1) HH) to (A1, B(WW-1) HH, C)

Annual critical low flows in Des Moines River at the outfall:
1Q10 flow 245.8 cfs, 7Q10 flow 271.8 cfs, 30Q10 flow 318.1 cfs, 30Q5 flow 437.3 cfs, harmonic mean flow 1,776.9 cfs

Annual critical low flows in Des Moines River at or just upstream of the Ottumwa Water Works Class C:
1Q10 flow 247.6 cfs, 7Q10 flow 273.4 cfs, 30Q10 flow 320.4 cfs, 30Q5 flow 440.6 cfs, harmonic mean flow 1,790.2 cfs

Performed by: Nolan Underwood

Antidegradation Review Requirement

A tier II antidegradation review is required. See Section 2 for details.

The antidegradation review conducted in this wasteload allocation is based on the current information available. Antidegradation could also be triggered during the NPDES permitting process based on new information.

ENVIRONMENTAL SERVICES DIVISION WATER QUALITY-BASED PERMIT LIMITS				
SECTION VI: WATER QUALITY-BASED PERMIT LIMITS Facility Name: IPL Ottumwa Midland Landfill				NPDES Number: TBD
Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 001	**ADW = 0.0014 MGD & AWW = 0.084 MGD**			
Toxics				
Arsenic (III)	1.488E+02	8.415E+02	1.737E+00	1.006E+01
Barium	1.843E+05	5.072E+05	2.153E+03	6.063E+03
Beryllium	8.137E+02	1.238E+03	9.504E+00	1.479E+01
Boron	8.292E+03	8.292E+03	9.912E+01	9.912E+01
Cadmium	1.447E+01	1.447E+01	1.729E-01	1.729E-01
Chloride	1,472,364	1,472,364	17,625	17,625
Chromium (VI)	4.033E+01	4.033E+01	4.821E-01	4.821E-01
Cobalt	4.208E+03	4.208E+03	5.030E+01	5.030E+01
Copper	6.658E+01	6.658E+01	7.959E-01	7.959E-01
Cyanide	5.445E+01	5.445E+01	6.509E-01	6.509E-01
Fluoride	1.937E+04	1.937E+04	2.318E+02	2.318E+02
Iron	2.475E+03	2.475E+03	2.959E+01	2.959E+01
Lead	2.101E+02	4.886E+02	2.458E+00	5.841E+00
Manganese	8.381E+03	8.381E+03	1.002E+02	1.002E+02
Nickel	2.087E+03	2.087E+03	2.495E+01	2.495E+01
Selenium	4.777E+01	4.777E+01	5.711E-01	5.711E-01
Silver	3.086E+01	3.086E+01	3.689E-01	3.689E-01
Sulfate	3,590,702	3,590,702	42,968	42,968
Thallium	2.069E+01	1.480E+03	2.419E-01	1.769E+01
Zinc	5.335E+02	5.335E+02	6.378E+00	6.378E+00

WLAs/Permit Limits for IPL Ottumwa Midland Landfill's Wastewater Discharge

These wasteload allocations and water quality-based permit limitations are for IPL Ottumwa Midland Landfill's wastewater discharge. The wasteload allocations/permit limits are based on the Water Quality Standards (IAC 567.61) and the "Iowa Wasteload Allocation (WLA) Procedure," effective November 11, 2020.

The water quality-based limits in this WLA are calculated to meet the surface water quality criteria to protect downstream uses. There could be technology-based limits applicable to this facility that are more stringent than the water quality-based limits shown in this WLA. The technology-based limits could be derived from either federal guidelines based on different industrial categories or permit writer's judgment.

Section 1. Background:

IPL Ottumwa Midland Landfill discharges a stream of wastewater consisting of groundwater from the landfill underdrain system into Des Moines River (proposed location, 41° 3' 39.86" N, 92° 28' 56.78" W).

Route of flow and use designations:

At the proposed outfall, Des Moines River is an A1 B(WW-1) HH designated use water body. After approximately 5.13 miles, the Des Moines River gains Class C protections at the City of Ottumwa Water Works. The designations have been adopted in Iowa's state rule described in the rule-referenced document of "Surface Water Classification," effective July 24, 2019. Based on the pollutants of concern, the use designations of water bodies further downstream will not impact the resulting limits for this facility.

Critical low flow determination:

The annual critical low flows in Des Moines River at the outfall are estimated based on the Drainage Area Ratio (DAR) method from "Methods for estimating selected low-flow frequency statistics and harmonic mean flows for streams in Iowa" (2012, revised 2017) and flow statistics obtained at USGS gage station 05488500, located on the Des Moines River at Tracy, Iowa. Another USGS gage lies downstream of the outfall at Ottumwa, Iowa. However, between the gage and the outfall lies both a dam and the Ottumwa Water Works intake, altering the resulting gage data. Thus, the downstream gage is not used for any flow determinations.

Table 1: Annual critical low flows

Location	D.A. (mi^2)	1Q10 (cfs)	7Q10 (cfs)	30Q10 (cfs)	30Q5 (cfs)	Harmonic mean (cfs)
Des Moines River at the outfall	13,300	245.8	271.3	318.1	437.3	1,776.9
Des Moines River Ottumwa Water Works Class C	13,400	247.6	273.4	320.5	440.6	1,790.2
Des Moines River at the Tracy Iowa gage	12,479	231.0	255.0	299.0	411.0	1,670.0

Mixing Zone (MZ) and Zone of Initial Dilution (ZID):
Approximately 1,740 feet downstream of the facility's proposed outfall, the perennial stream Unnamed Creek junctures with the Des Moines River. Based on 567 IAC 61.2(4)"b"(2) and "e"(2) the maximum allowable mixing zone length is 2,000 feet and is restricted by the distance to the juncture of two perennial streams for toxics and ammonia nitrogen. Therefore, the MZ and ZID are proportionately reduced to (1,740 / 2,000) 87% of their default values for toxics and ammonia nitrogen. Note, this limitation does not apply to pH. A summary of restrictions can be found below in Table 2.

Table 2:MZ and ZID

Pollutant	Default		Shortened	
	ZID	MZ	ZID	MZ
Toxics	2.5%	25%	2.18%	21.8%
Ammonia Nitrogen	2.5%	25%	2.18%	21.8%
pH	--	25%	--	25%

Section 2. Antidegradation Review:
According to the "Iowa Antidegradation Implementation Procedure," effective February 17, 2010 (IAC 567-61.2(2).e), all new or expanded regulated activities (with limited exceptions, such as unsewered communities) are subject to antidegradation review requirements.

Table 3: Antidegradation review analysis

Item #	Factor or scenario	Antidegradation determination	Analysis/comments
1	Design capacity increase	Yes ☒, No ☐, or Not Applicable ☐	1: New Outfall
2	Significant Industrial Users (SIU) contributing new pollutant of concern (POC)	Yes ☐, No ☐, or Not Applicable ☒	
3	New process contributing new pollutant of concern (POC)	Yes ☐, No ☒, or Not Applicable ☐	
4	Less stringent water quality-based limits?	Yes ☐, No ☒, or Not Applicable ☐	
5	Outfall location change	Yes ☒, No ☐, or Not Applicable ☐	1: New Outfall
Conclusion and discussion: Due to Items 1 and 5, a tier II antidegradation review is required. The antidegradation review conducted in this WLA is based on the current information available. Antidegradation could also be triggered during the NPDES permitting process based on new information.			

Section 3. Total Maximum Daily Load (TMDL) Limitations:
The following impaired water bodies in the discharge route are contained in the 2024 Iowa Integrated Report:

- Des Moines River for bacteria (indicator: *E. coli*) and fish kill due to unknown toxicity

This facility has not been assigned any allocations from TMDLs at this time.

The results presented in this report are wasteload allocations based on meeting the State's current water quality standards in the receiving water body. Additional and/or more stringent effluent limits may be applicable to this discharge based on approved TMDLs for impaired water bodies, which may provide watershed based wasteload allocations. Information on impaired streams in Iowa and approved TMDLs can be found at the following website: https://www.iowadnr.gov/environmental-protection/water-quality/watershed-improvement/water-improvement-plans.

Section 4. Calculations:
The WLAs/permit limits for this outfall are calculated based on the facility's Average Dry Weather (ADW) design flow of 0.0014 MGD and its Average Wet Weather (AWW) design flow of 0.084 MGD.

Only wasteload allocations/permit limits (water quality-based effluent limits) calculated using DNR approved design flows can be applied in NPDES permits. Water quality-based effluent limits calculated using proposed flows that have not been approved by the DNR for permitting and compliance may be used for informational purposes only.

The water quality-based permit concentration limits are derived using the allowed stream flow and the ADW design flow, while the loading limits are derived using the allowed stream flow and the AWW design flow.

Toxics:
The toxics wasteload allocations will consider the procedures included in the 2000 revised WQS and the 2007 chemical criteria.

To protect the aquatic life use:
The acute criteria apply at the end of the Zone of Initial Dilution (ZID), and the chronic criteria apply at the end of the Mixing Zone (MZ). In this case, 21.8% of the 7Q10 flow and 2.18% of the 1Q10 flow in Des Moines River at the outfall are used as the MZ and the ZID, respectively.

Default effluent and background chloride and sulfate concentrations of 34 mg/l and 63 mg/l, respectively, are used in the applicable criteria. A default hardness of 200 mg/l for background and effluent is used for applicable criteria. Default background concentrations are used for other toxics in cases where there is sufficient stream data.

Effective November 11, 2020, water quality criteria for metals (excluding aluminum) are expressed as dissolved in IAC 567.61. Using EPA dissolved metal translators, water quality-based effluent limits in this WLA are expressed as total recoverable.

To protect the human health (HH) use:
For pollutants that are non-carcinogenic and have criteria for HH protection, the criteria apply at the end of the MZ, which in this case is 21.8% of the 30Q5 flow in Des Moines River at the outfall.

For pollutants that are carcinogenic and have criteria for HH protection, the criteria apply at the end of the MZ, which in this case is 21.8% of the harmonic mean flow in Des Moines River at the outfall.

To protect the Class C use:
The City of Ottumwa water works lies approximately 5.13 miles downstream of the outfall on the Des Moines River.

For pollutants that are non-carcinogenic and have criteria for maximum contaminant level (MCL), the criteria apply at the end of the MZ, which in this case is 100% of the 30Q5 flow in the Des Moines River at the nearest Ottumwa Water Works water intake.

For pollutants that are carcinogenic and have criteria for maximum contaminant level (MCL), the criteria apply at the end of the MZ, which in this case is 100% of the harmonic mean flow in the Des Moines River at the nearest Ottumwa Water Works water intake.

Final limits:
The maximum limits are those calculated for the protection of the aquatic life use and the average limits are the more stringent between those for the protection of the aquatic life use, those for the protection of the HH use, and those for the protection of the downstream Class C use.

The limits for toxics are based on a sampling frequency of 1/week.

Ammonia Nitrogen:
Standard stream background pH, temperatures, and concentrations of NH3-N are mixed with the discharge from the facility's effluent pH and temperature values to calculate the applicable instream criteria for the protection of Des Moines River.

Based on the ratio of the stream flow to the discharge flow, 2.18% of the 1Q10 flow and 21.8% of the 30Q10 flow in Des Moines River at the outfall are used as the ZID and the MZ, respectively. At the outfall, Des Moines River is a B(WW-1) stream; therefore, early life protection will begin in March and run through September.

The monthly background pH, temperatures, and NH3-N concentrations shown in Table 4 are used for the wasteload allocation/permit limits calculations. Table 5 shows the statewide monthly effluent pH and temperature values for mechanical facilities. The background category is based on the characteristics of flexible holding time prior to discharge and industrial type POCs, which most aligns with the pH and temperature granted to mechanical facilities. Table 6 shows the calculated ammonia nitrogen wasteload allocations for this facility.

Table 4: Background pH, temperatures, and NH3-N concentrations

Months	pH	Temperature (°C)	NH_3-N (mg/l)
January	8.1	0.3	0.02
February	8.0	0.1	0.08
March	8.1	1.5	0.12
April	8.3	9.3	0.03
May	8.2	15.0	0.03
June	8.2	19.4	0.02
July	8.2	23.5	0.02
August	8.2	24.3	0.02
September	8.3	20.2	0.02
October	8.3	14.2	0.02
November	8.3	8.0	0.02
December	8.3	0.8	0.03

Table 5: Standard effluent pH and temperature values for mechanical facilities

Months	pH	Temperature (°C)
January	7.67	12.4
February	7.71	11.3
March	7.69	13.1
April	7.65	16.2
May	7.67	19.3
June	7.7	22.1
July	7.58	24.1
August	7.63	24.4
September	7.62	22.8
October	7.65	20.2
November	7.69	17.1
December	7.64	14.1

Table 6: Wasteload allocations for ammonia nitrogen for the protection of aquatic life

Months	ADW-based[1]		AWW-based[2]	
	Acute (mg/l)	Chronic (mg/l)	Acute (mg/l)	Chronic (mg/l)
January	17,158	108,395	302	1,809
February	20,618	123,965	358	2,070
March	16,910	63,308	297	1,057
April	11,609	47,836	211	798
May	14,112	54,701	252	913
June	14,136	41,273	251	689
July	14,140	31,537	256	526
August	14,138	29,920	254	499
September	11,635	33,190	213	554
October	11,634	49,169	212	821
November	11,632	73,646	210	1,229
December	11,609	78,273	212	1,307
1: Bases for concentration limits 2: Bases for mass loading limits				

CBOD5/Total Dissolved Oxygen:
Streeter-Phelps DO Sag Model is used to simulate the decay of CBOD and dispersion of total Dissolved Oxygen (DO) in the receiving water downstream from the outfall. The criterion is that the discharge cannot cause the DO level in the receiving stream (warm water) to be below 5.0 mg/l.

The parameter values used in the modeling are listed below:

Background:
The temperature and ammonia nitrogen levels are shown in Table 4. The ultimate CBOD and DO levels are assumed to be 6.0 mg/l and 6.0 mg/l, respectively.

Effluent:
The temperatures are shown in Table 5. The CBOD5 level used in the modeling is 7,739,579 mg/l. The ammonia nitrogen values used in the modeling are the calculated acute wasteload allocations shown in Table 6. Both ADW and AWW flows and the ammonia nitrogen limits associated with them are used in the modeling.

Receiving stream parameters:
There is an average water channel slope of 0.00022 (the water channel elevation changes from 644 ft to 640 ft over a distance of approximately 17,985 ft, estimated based on the GIS LiDAR 2-ft contour coverage).

USGS gage 05489500, which was located on Des Moines River at Ottumwa, IA, had field measurement data, such as stream flow, cross sectional area, stream width, and velocity. The Ottumwa gage is utilized for DO reaeration modeling as it most concerns the downstream effects of the facility effluent. Flow values use in modeling are still derived from the upstream USGS gage at Tracy, Iowa. The stream depth is not reported; however, it can be derived using the following equation:

Depth = Cross Sectional Area / Width

Regression equations of Ln(Velocity) vs. Ln(Flow) and Ln(Depth) vs. Ln(Flow) were established with acceptable R-squared values. The stream depth was also calculated.

Ln(Velocity) = 0.3466Ln(Flow) - 2.099; $R^2 = 0.7895$
Ln(Depth) = 0.4906Ln(Flow) - 2.8431; $R^2 = 0.7827$
Width = Flow / (Depth * Velocity)

The gage station is located approximately 5.5 miles downstream of the outfall. Therefore, it is assumed that the above equations are valid in the Des Moines River at the outfall.

The stream width, depth, and velocity at annual critical 7Q10 + ADW and annual critical 7Q10 + AWW conditions were estimated using the above equations.

Table 7: Stream width, depth, and velocity

Flow Condition	Flow (cfs)	Width (ft)	Depth (ft)	Velocity (fps)
7Q10 + ADW	271.30	348.7	0.91	0.85
7Q10 + AWW	271.43	348.8	0.91	0.85

Reaeration:
Due to the size and velocity of the Des Moines River at the proposed outfall, USGS channel-control (Melching and Flores, 1999) best models reaeration conditions at the outfall and is utilized for DO calculations.

Discussion and conclusion:
The modeling results show that the effluent, which could have an allowed maximum effluent CBOD5 level of 7,739,579 mg/l and ammonia nitrogen levels as shown in Table 6, will not cause the DO level in the receiving stream to be below 5.0 mg/l at any time. Numerical DO limits are not required.

COD:
It is conservatively assumed that ultimate CBOD (CBODu) is approximately equivalent to COD and that all COD will be biologically available in the stream.

The CBODu was estimated using the following equation:

$$CBODu = CBOD5*(1/(1-\exp(-5*K_d))$$

Where K_d is the CBOD decay rate for a given month, which in turn was determined by the following equation:

$$K_d = K_{20}*1.047^{(T-20)}$$

Where T is the monthly effluent temperature, as shown in Table 5. K_{20} is the CBOD decay rate at 20 °C, which is determined using the following equation:

$$K_{20} = K_{d0} + b * (V/d)$$

Where K_{d0} is the laboratory CBOD decay rate at 20 °C, the value is assumed to be 0.2/day. b is the bed activity coefficient, determined to be 0.06. V is the flow velocity and d is the depth, as shown in Table 6. The COD concentration limit was determined to be 9,719,650 mg/l, and the mass loading was 113,528 lbs/day, which was derived based on the AWW-based concentration limit of 161,956 mg/l.

Iron:
Iron criteria are defined in the issue paper "Iron Criteria and Implementation for Iowa's Surface Waters" (November 11, 2020). A dissolved iron criterion of 1 mg/l applies at the end of the ZID for both general use and designated use streams. In this case, the ZID is 2.18% of the 1Q10 flow in Des Moines River at the outfall. Water quality-based effluent limits for iron in this WLA are expressed as total recoverable.

Boron, Cobalt, and Manganese:
There are no numerical criteria for manganese, boron, nor cobalt in Iowa's water quality standards. However, the water quality standards specify, in the form of narrative criteria, that all surface waters shall be free from materials attributable to wastewater discharges or agricultural practices in concentrations or combinations which are acutely toxic to human, animal, or plant life (567 IAC 61.3(2)d).

This narrative criterion is implemented through the concept of establishing a no effect level or LC0 as described in the 'Iowa Wasteload Allocation Procedure'. The LC0 or the estimate of the concentration that will not be acutely toxic is determined by calculating the value of ½ the 48 or 96-hour LC50 for the most sensitive resident species. In cases with multiple applicable 48 or 96-hour LC50 values, the Species Mean Acute Value (SMAV) was used.

There is limited toxicity data available for manganese, cobalt and boron. The criteria are shown in Table 8. This applies at the end of the ZID. In this case, 2.18% of the 1Q10 flow in the Des Moines River at the outfall is used as the ZID.

Table 8: Narrative Criteria for Select Toxics

Toxic	Criterion (mg/l)	Toxicity End Point	Toxicity Testing Organism
Boron	3.35	½ 48-hour LC50	Daphnia magna
Cobalt	1.7	½ 96-hour LC50	Fathead minnow
Manganese	3.386	1/2 SMAV	Midge

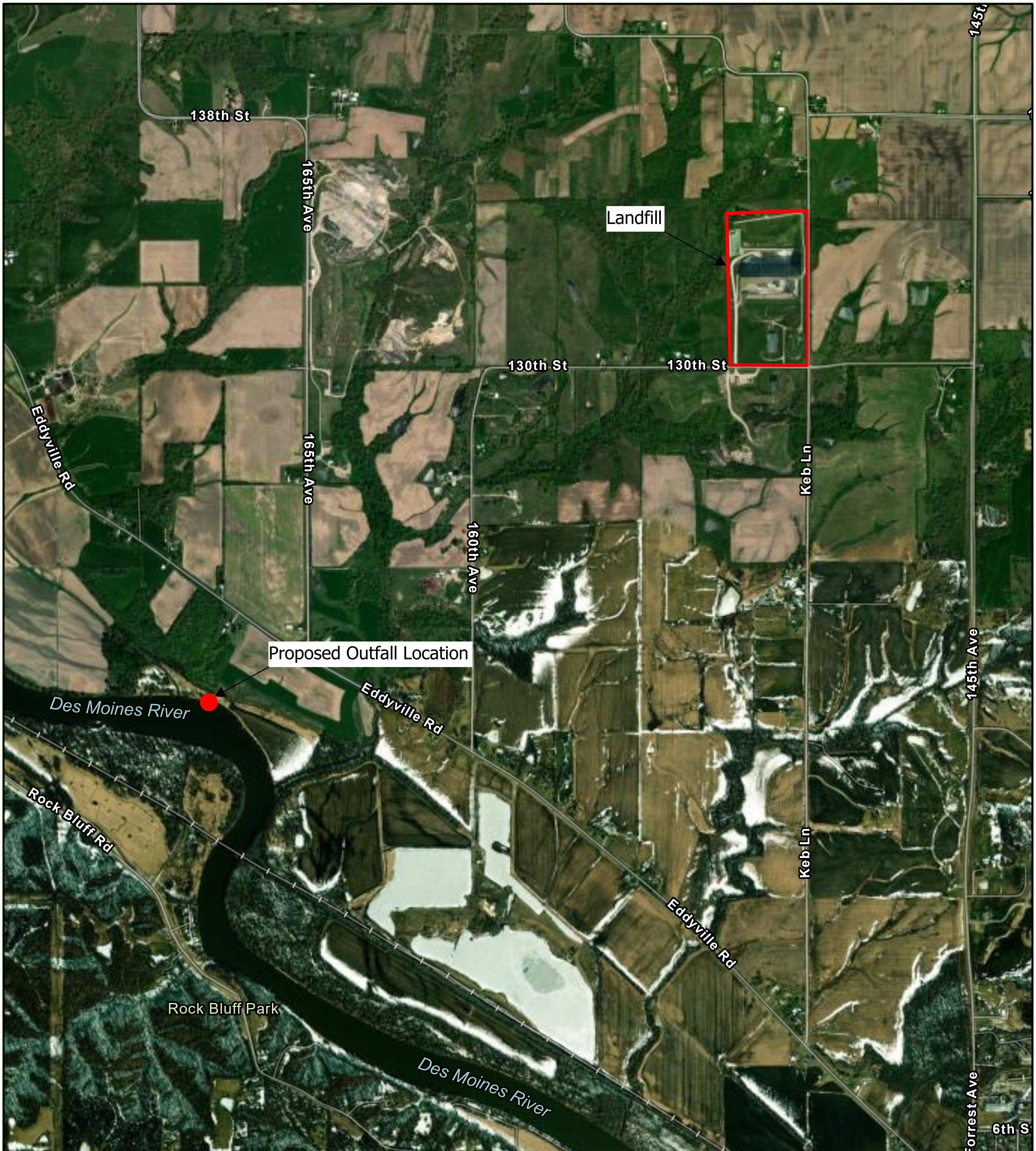
pH:

Iowa Water Quality Standards (IAC 567.61.3.(3).a.(2) and IAC 567.61.3.(3).b.(2)) require that pH in Class A or Class B waters "shall not be less than 6.5 nor greater than 9.0." The criteria apply at the end of the MZ, which is 25% of the 7Q10 flow in Des Moines River at the outfall.

Section 5. Permit Limitations:

The acute and chronic WLAs are used as the values for input into the current permit derivation procedure. The water quality-based limits are shown on Pages 1 and 2 of this report.

8.0 APPENDIX B – PROPOSED DES MOINES RIVER OUTFALL 001 LOCATION MAP



HRGreen

Alliant Energy

Proposed Outfall Location for Landfill Underdrain Discharge

Alliant Energy
Ottumwa, Iowa

0 1,000 2,000 Feet

N

ATTACHMENT 2

Lee, Brian <brian.lee@dnr.iowa.gov>

IPL Ottumwa Midland Landfill Underdrain Discharge

1 message

Bizjack, Matthew <MatthewBizjack@alliantenergy.com> Wed, Sep 6, 2023 at 3:53 PM
To: "Ryan.Stouder@dnr.iowa.gov" <Ryan.Stouder@dnr.iowa.gov>, "bert.noll@dnr.iowa.gov" <bert.noll@dnr.iowa.gov>, "Lee, Brian [DNR]" <brian.lee@dnr.iowa.gov>
Cc: Terry Jones <terry.jones@dnr.iowa.gov>, "Maxted, Jeffrey" <JeffreyMaxted@alliantenergy.com>, "Coughlin, Jenny" <JennyCoughlin@alliantenergy.com>, "White, Christopher" <ChristopherWhite@alliantenergy.com>, "Saunders, Rob" <RobSaunders@alliantenergy.com>

Ryan, Bert, and Brian,

Thank you for meeting with us Wednesday, August 23, 2023, regarding the underdrain discharge from Interstate Power and Light (IPL) Ottumwa Midland Landfill (OML, Permit #90-SDP-08-92). As we discussed during the meeting, IPL is planning on installing a method of managing the discharge from the OML underdrain systems that drain groundwater from beneath the landfill liner. Currently, these underdrains discharge to surface water onsite.

IPL is in the process of determining and designing a solution for the underdrain discharges. As we discussed on the call, below is a narrowed-list of options under consideration:

- Discharge to Ottumwa POTW via Force-main
- Discharge to Ottumwa POTW via hauling
- Developing a land application treatment system
- Installing onsite treatment and discharging to surface water directly

IPL will keep the IDNR Field Office updated on progress of selecting an option and proceeding with the installation, including the selection of a solution and projected timelines for its installation. IPL will work with the Department on any required amendment to the OML Landfill Permit and other permitting requirements required prior to implementing a solution. IPL currently estimates a date of 12/31/2025 to cease the underdrain discharge, or meet the waste load allocation limits previously calculated for the discharge. IPL will send an update on or before 1/31/2024 to the Department on its progress toward these above items, and semi-annually thereafter until project completion.

Please let us know if you have any questions or comments related to this plan.

Regards,

Matt Bizjack | Senior Environmental Specialist

Pronouns: He/him/his

Alliant Energy

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