REPORT OF THE PRETREATMENT COMPLIANCE INSPECTION

AT
City of Keokuk
415 Blondeau Street
P.O. Box 400
Keokuk, Iowa 52632

NPDES Permit No.: **IA0042609**

BY
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 7
ENFORCEMENT AND COMPLIANCE ASSURANCE DIVISION (ECAD)
WATER BRANCH/DRINKING WATER & INSPECTIONS SECTION (WB/DWIS)

ON
FEBRUARY 20, 22 AND MARCH 29, 2024

At the request of the Water Branch (WB), Enforcement and Compliance Assurance Division (ECAD), a Pretreatment Compliance Inspection of the Keokuk Approved Industrial Pretreatment Program (IPP) was conducted on February 20, and 22 and March 29, 2024. To direct the inspection, a checklist was used that evaluates all important elements of the Pretreatment Program. A copy of the checklist is attached to this report (Attachment 1). The inspection consisted of a discussion and file review of the city's program and site visits to St. Louis Gear Company. In addition, I conducted a brief file review of the City's Biosolids Management Program (Sludge). This narrative report presents the findings of the inspection.

Participants

Keokuk Industrial Pretreatment Program

- Thomas Wills, IPP Coordinator — twills@cityofkeokuk.org
- Edward Askew, PhD, Askew Scientific Consulting — efaskew@hotmail.com
- David Glasscock, Lab Supervisor — davidglasscock@cityofkeokuk.org
- Chris Lindner, LCL Farms, Inc. (Biosolids) — lclfarmsinc@gmail.com

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Facility Description and Program Overview

The city of Keokuk, Iowa, with a population of 9,900 people owns and operates one activated sludge wastewater treatment plant (WWTP), located at 1000 Mississippi Drive, under the

National Pollutant Discharge Elimination System (NPDES) permit number IA0042609 that expired on August 31, 2023. According to the NPDES permit, the WWTP has a design average dry weather (ADW) flow of 3.43 million gallons per day (mgd), a design average wet weather (AWW) flow of 5.00 mgd, a design maximum wet weather (MWW) flow of 7.50 mgd, a design 5-day biochemical oxygen demand (BOD5) load of 1,1900.0 lbs/day, and a design Total Kjeldahl Nitrogen (TKN) load of 2,088.0 lbs/day. The WWTP actual average daily flow in 2023 was 1.348 mgd. Treated effluent by the WWTP discharges into Mississippi River. All produced biosolids are land applied.

The Keokuk Industrial Pretreatment Program was originally approved on August 4, 1983, and the NPDES permit was modified on July 27, 1984, requiring the city to implement its approved program. In 1993, the IPP revised the of the original sewer use ordinance (SUO) and the enforcement response plan (ERP), and on July 7, 1993, the city enacted Chapter 13.10.

The city's previous NPDES permit, that expired on August 31, 2018, required the city to evaluate its approved IPP for compliance with the 2005 Pretreatment Streamlining Rule and required a report to be submitted to the IDNR on September 1, 2016. On November 17, 2016, the city incorporated the Pretreatment Streamlining Rule into the revised Chapter 13.10. The IPP also developed the current ERP that was approved on October 19, 2016.

Because: (1) recent audits and compliance inspections by the EPA and the IDNR concluded that the city was not implementing its approved IPP adequately (inadequate inspections, wrong compliance determinations, not following the ERP, not updating industrial user list, etc.) as required by the NPDES permit, state, local, and the general pretreatment regulations, and (2) because the current NPDES permit required the city to evaluate adequacy of its local limits to meet the general prohibition against interference and pass through and submit a report by September 1, 2019, the city of Keokuk hired Askew Scientific Consulting to assist the city reevaluate and update its entire IPP.

Edward Askew mentioned that Askew Scientific Consulting used reports and data provided by USEPA Region 7, Iowa DNR and the city of Keokuk records to consider an in-depth evaluation of the city of Keokuk's IPP and develop a detailed corrective action plan.

In addition, on June 9, 2023, the IDNR issued an Administrative Consent Order to the city because of the WWTP NPDES violations caused by Archer Daniels Midland Milling (ADM) discharges that interfered with the WWTP treatment, the IPP's failure to adequately develop and enforce a city-issued permit limits on ADM, and failure to follow the ERP.

ADM was the only regulated industry by the Keokuk IPP for almost a decade. In recent years, however, ADM discharged a wastestream to the WWTP that interfered with the WWTP's ability to remove eighty-five percent (85%) of the CBOD and TSS from the influent for multiple days which caused the WWTP to violate its NPDES permit limits. The IDNR issued two notices of violation (NOV) to the city on January 14, 2022, and on May 19, 2022, for those violations.

In response to the IDNR NOVs, the Keokuk IPP initiated an enforcement against ADM in April 2022. ADM ceased operations and closed its plant on August 30, 2022. In 2023, the city

collected $225,508 in administrative fines from ADM after they had closed down.

Records indicate that since the hiring of Askew Scientific Consulting by the city, there was significant improvement to the Keokuk IPP implementation. Askew Scientific Consulting conducted an industrial waste survey (Attachment 4) on behalf of the city to identify industrial contributors or users to the WWTP. In April 2022, using Keokuk Waterworks records, the city identified at least fourteen industries as significant industrial users (SIUs), most of which submitted a baseline monitoring report (Attachment 2). Twelve of the fourteen industrial users are subject to one or more federal categorical standards. Two of the 14 SIUs are zero dischargers. Askew and the IPP Coordinator (Thomas Wills) inspected most industries in 2023 (Attachment 3), issued interim permits on May 15, 2023, and issued final permits to ten industries in January and February 2024 (Attachment 5).

Based on the permitted flows, industrial discharges make up approximately twenty percent (20.15%) of the WWTP's actual 2023 average daily influent of 1.348 mgd.

Askew Scientific Consulting is currently working on evaluating the program's local limits, updating the SUO, and evaluating and revising the ERP (Attachment 7).

Records indicated that Askew Scientific Consulting and the Keokuk IPP have been communicating the IDNR's Pretreatment Coordinator Ben Hucka in approving the new changes to the Keokuk IPP.

Legal Authority and Local Limits

During my review of the Keokuk pretreatment ordinance, I notice that Section 13.10.070(a)(1) reads, "Any user which has violated or continues to violate this chapter, any order or wastewater discharge permit hereunder, or any pretreatment standard or requirement, referred to in 40 CFR 403.8, shall be liable to the city for a civil penalty in an amount not to exceed one thousand dollars for each day a violation exists or continues". This section doesn't comply with 40 CFR 403.8(f)(1)(vi)(A) which reads, all POTWs shall have authority to seek or assess civil or criminal penalties in at least the amount of $1,000 a day for each violation by industrial users of pretreatment standards and requirements.

Section 13.10.030(e) lists the local limits as maximum allowable headworks loadings (MAHLs) as mass limits (pounds/day) (Table 1). MAHLs are the total wastewater discharge of all users to the WPCF, in combination with domestic users. The Section also includes maximum allowable industrial loads (MAIL) as concentration limits (Table 2) and calls it uniform concentration limits. MAIL/uniform concentration limits apply at the point where the industrial waste is discharged to the city's sanitary sewers.

Table 1, Keokuk's WWTP MAHLs mass limits (pounds/day)

Pollutant	Maximum (MAHL)	Pollutant	Maximum (MAHL)	Pollutant	Maximum (MAHL)
Ag	3.300	Ni	10.126	Cu	22.550
As	1.688	Pb	4.090	Hg	0.381
Cd	1.285	Se	2.025	Mo	1.519

Pollutant	Maximum (MAHL)	Pollutant	Maximum (MAHL)	Pollutant	Maximum (MAHL)
CN	2.409	Zn	24.095	TSS	13,000
Cr	24.095	BOD	11,900	TKN	2,088

Table 2, Keokuk's WWTP MAIL as concentration limits (mg/l)

Pollutant	Maximum (MAIL)	Pollutant	Maximum (MAIL)	Pollutant	Maximum (MAIL)
Ag	0.495	Ni	1.150	Cu	3.337
As	0.252	Pb	0.537	Hg	0.057
Cd	0.190	Se	0.307	Mo	0.230
CN	0.295	Zn	3.370	TSS	13,000
Cr	3.593	BOD	NDA	TKN	DNA

DNA = Technical analysis was performed but the limit was not adopted in 2017.

Inspections and Compliance Sampling

Edward Askew and the Keokuk IPP Coordinator conducted inspections of the regulated industries in October and November of 2023. However, only the first page of the EPA's model six-page industrial user checklist was used to document inspection reports.

Self-monitoring frequency is described in detail in the industrial permits. Records indicated that with the instruction of Edward Askew the IPP conducted 182 sampling events in 2023 to collect baseline data from ten of the new industries.

Permits

Askew Scientific Consulting, on behalf of the city, developed industrial user permit documents that included the required language for an enforceable permit such as self-monitoring, reporting, and accidental/slug discharge. On May 15, 2023, the IPP issued interim permits, and then issued final permits to ten industries in January and February 2024 (Attachment 5). Askew Scientific Consulting continue modifying language as they gain more knowledge of the nature of the new industries.

For instance, the city worked focused on Roquette America because the industry had the idea that they had no process waste going to the city, therefor excluding them from needing to be permitted. The IPP required them to do a BMR which showed the presence of chloroform and phenol in their process wastestream to the city. They were issued an interim permit on November 2nd, 2023, in which they were required to install sampling mechanisms and flow metering devises. They were issued a final pretreatment permit on February 1, 2024.

The ten industries that received final industrial permits are: Amestead Rail, Carry Transit, Decker, Ferro-Sil Monofill Landfill, Glycerin, Gully Transport, Henniges, Keokuk Steel, Roquette, and St. Louis Gear.

Waste Haulers

The city continues to accept domestic waste and grease at an access point (manhole) inside the main gate of the WWTP and before the headworks. Special wastes used to be accepted from

Iowa Fertilizer Co. which they were required by the IPP to submit a laboratory analysis result for TKN, COD, and ammonia of the hauled material with a chain-of-custody. Records indicate that in 2023 the WWTP received a total of 205 loads with a total volume of 0.20882 million gallons.

ENFORCEMENT

The enforcement response plan was last updated in October 2016. Askew Scientific Consulting is currently working on evaluating the ERP and will revise it as needed and submit it to the IDNR for approval as necessary. During the inspection it was apparent that IPP Coordinator was not familiar with the ERP and did not have a full understanding of the definition of Significant Noncompliance

DATA MANAGEMENT

Overall, the industrial files have all the necessary documentation as recommended by the Agency checklist. Files consisted of permit, inspection reports, monitoring reports, and correspondence between the IPP and the industries.

Dental Amalgam Rule

In compliance with the Dental Amalgam Rule 40 CFR 441 requirements, in 2018 the IPP identified five dental offices that discharge to the WWTP. All submitted the one-time compliance report to the city/IPP (Control Authority) and all installed a treatment devices (Solmetex Hg5).

Sludge Quality (Attachment 6)

One function of the IPP is to protect the city's sludge from metals contamination. As part of this inspection, the 2022 and 2023 annual biosolids reports were reviewed to determine the IPP's effectiveness. In 2022, the city produced 2,250.4 dry metric tons (dmt) and in 2023, produced 2603.2 dmt.

Below are the 2022 and 2023 tables that compares the city's peak observed metals level against the statutory ceiling and the city's average level against the exceptional quality (EQ) sludge level specified by the 40 C.F.R. Part 503 Sludge regulations. Because the city sampled its sludge six times per year, the monthly average is the maximum value observed.

Table 3, 2022 Keokuk WWTP Sludge Quality (mg/kg)

Pollutant	503 Ceiling	503 EQ	Max	Mo. Avg.	Max/Ceiling	Avg./EQ
Arsenic, As	75	41	7.5	7.5	10.00%	18.29%
Chromium	3000	1200	11.7	11.7	0.39%	0.98%
Cadmium, Cd	85	39	1	1	1.18%	2.56%
Copper, Cu	4300	1500	60.9	60.9	1.42%	4.06%
Lead, Pb	840	300	10.7	10.7	1.27%	3.57%
Mercury, Hg	57	17	0.15	0.15	0.26%	0.88%
Molybdenum , Mo	75	----	16.6	16.6	22.13%	
Nickel, Ni	420	420	48.8	48.8	11.62%	11.62%
Selenium, Se	100	36	38.2	38.2	38.20%	**106.11%**
Zinc, Zn	7500	2800	150	150	2.00%	5.36%

Table 4, 2023 Keokuk WWTP Sludge Quality (mg/kg)

Pollutant	503 Ceiling	503 EQ	Max	Mo. Avg.	Max/Ceiling	Avg./EQ
Arsenic, As	75	41	3.3	3.3	4.40%	8.05%
Chromium	3000	1200	8.6	8.6	0.29%	0.72%
Cadmium, Cd	85	39	0.6	0.6	0.71%	1.54%
Copper, Cu	4300	1500	48.4	48.4	1.13%	3.23%
Lead, Pb	840	300	20.8	20.8	2.48%	6.93%
Mercury, Hg	57	17	0.12	0.12	0.21%	0.71%
Molybdenum , Mo	75	----	44.4	44.4	59.20%	
Nickel, Ni	420	420	23.8	23.8	5.67%	5.67%
Selenium, Se	100	36	81.3	81.3	81.30%	**225.83%**
Zinc, Zn	7500	2800	116	116	1.55%	4.14%

As shown in the tables above, the city's sludge is well below both the ceiling and EQ levels for all metals except for selenium where it exceeded the EQ levels in 2022 and 2023. During my review of laboratory report for metal analyses data (Attachment 8), I noticed that there were significant variations in the numerical result of the data for some of the metals as shown in tables 5 and 6 below. I explained to IPP Coordinator that although the data is within the 503 limits, the IPP should be investigating the reason behind such variation/spikes.

Table 5, 2023, Keokuk WWTP Metal Concentration Variations

Pollutant/date	January	March	May	July	September	November
Arsenic	3	1.8	3.3	1.5	1.0	3.1
Chromium	8	8.6	8.4	8.2	5.2	5.0
Cadmium	0.6	0.5	0.4	0.6	0.3	0.2
Copper	47.4	48.4	31.2	27.7	32.3	29.2
Lead	5.5	9.6	11.2	**20.8**	7.9	4.0
Mercury	0.09	0.05	**0.12**	0.04	0.03	0.03
Molybdenum	9.2	12.0	**44.4**	7.1	1.8	2.5
Nickel	10.4	**46.0**	**23.8**	6.2	5.9	6.3
Selenium	2.2	4.0	**25.0**	**81.3**	**53.3**	**56.3**
Zinc	112	116	91.6	64.9	51.4	59.7

Table 6, 2022, Keokuk WWTP Metal Concentration Variations

Pollutant/date	January	March	May	July	September	November
Arsenic	4.3	2.1	**7.5**	2.9	6.9	3.5
Chromium	7.7	8.8	11.7	6.5	**14**	7.3
Cadmium	0.6	1.0	0.8	0.6	0.7	0.3
Copper	55.1	46.4	**60.9**	30.8	**59.2**	39.2
Lead	4.1	5.5	7.2	5.9	10.7	7.9
Mercury	0.08	0.07	**0.12**	**0.15**	0.10	0.07
Molybdenum	6.9	**16.6**	**11.1**	5.0	**16.4**	8.1
Nickel	11.1	**48.4**	**21.7**	10.3	19.5	9.8
Selenium	8.0	21.1	15.3	8.8	**38.2**	7.2
Zinc	138	130	150	**69.9**	164	123

Laboratory data also shows the following:

Table 7, 20203 Keokuk annual average

	2022	2023
Total Nitrogen	15258	7600
Nitrogen, Ammonia	1823	1029
Nitrogen, Nitrate + Nitrite	2.8	1.6
%Total Solids	31.5	42.8
Nitrogen, Kjeldahl	15242	7600
Phosphorus	5967	4878

The city land applied all the produced sludge in 2022 and 2023. Land application is handled by the contractor LCL Farms, Inc. Overall, biosolids management appeared adequate and land application operations were well documented, and the facilities were well maintained.

Conclusion

Overall, the Keokuk industrial pretreatment program is going through significant and in-depth evaluation by Askew Scientific Consulting on behalf of the city. One milestone accomplished by the city was conducting an industrial waste survey and updating the list of industrial users which resulted in 14 industries being identified as potential significant industrial users. Currently, Askew Scientific Consulting and the city are evaluating the core elements of Keokuk IPP such as the sewer use ordinance, local limits, and enforcement response plan. As a reminder and as required by 40 CFR Part 403 and Rule 567 IAC 62.4(455B), all significant program modifications must be submitted to the Iowa DNR for review and approval before enacted on. Although the city did not meet the required deadline by the NPDES permit, the city is in constant communication with Ben Hucka.

The Keokuk IPP Coordinator is responsible for the implementation of the Keokuk's IPP. However, based on my interview with the IPP Coordinator, it appeared that the coordinator does not have the adequate training and knowledge to implement the program. In addition, the coordinator was not familiar with the ERP, the ordinance, nature of the regulated industries, or the EPA's Significant Noncompliance definition.

Such observations are a common trend of the Keokuk IPP based on previous EPA and IDNR audits and compliance inspections of the Keokuk IPP. Therefore, I issued notice of preliminary findings number 1 (NOPF#1) (Attachment 8) for the city of Keokuk failure to have qualified personnel to carry out the authorities and procedures described in paragraphs (f)(1) & (2) of 403.8(f)(3). It is critical that the coordinator revisit and be well-informed of the city's SUO, and the ERP including enforcement procedures. It also as critical that the city of Keokuk cross train additional qualified personal on the implementation of the Keokuk IPP.

In addition, I issued NOPF #2, because the city of Keokuk failed to conduct adequate annual inspections of its regulated industrial users as required by 403.8(f)(1)(v). It was repeatedly recommended during previous audits and inspections for the city to verify compliance with applicable pretreatment requirements, and that the city should conduct thorough inspections of

its industries. Inspections should consist of a facility walkthrough, records review, and review of self-monitoring/sampling procedures. Records indicate that recent inspections of new industries and recent inspections of ADM consisted of a one-page inspection sheet that included the industry's general information. However, there were no descriptions of the IU's treatment processes or its effectiveness, evaluation of IU's monitoring methods and monitoring procedures, verification of wastewater flow rates, determination of applicability of the CWF, descriptions of the chemical storage area, identification of potential spill conditions, or the need for slug discharge/spill Plan.

The IPP Coordinator should review the biosolids laboratory reports for the concentration of metals and investigate the reason behind the variation/spikes in metal concentration in the sludge even if the concentration in compliance with the 40 CFR 503 ceiling limits.

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NICOLE MORAN Digitally signed by NICOLE MORAN Date: 2024.04.22 10:44:05 -05'00'

Nicole Moran
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Attachments

1. Checklist
2. IU Baseline Monitoring Reports
3. IU inspections
4. IWS
5. Industrial permits
6. Sludge data
7. ERP
8. NOPF