

Exhibit 40

**Biotic assessment of water quality in a reach of the Sangamon River
receiving effluent from the Sanitary District of Decatur**

REPORT FOR YEAR - 2008

**Charles L. Pederson Ph.D. and Robert U. Fischer, Ph.D.
Department of Biological Sciences
Eastern Illinois University
Charleston, Illinois 61920**

**Submitted to:
Sanitary District of Decatur
501 Dipper Lane
Decatur, Illinois 62522**

July, 2009

EXECUTIVE SUMMARY

We utilize sampling locations associated with operation of SDD that were easily identified by prominent landmarks within the City of Decatur, Illinois, USA. Sites were established initially in 1998 during an assessment of potential impacts of discharges from combined sewage overflow (CSO) facilities as well as the main treatment plant. Throughout this report, we will refer to general locations as either UPSTREAM or DOWNSTREAM of the SDD main treatment plant discharge.

Levels of 12 water quality variables were determined from eleven mainstem sites in 2006. Previously, we documented that UPSTREAM and DOWNSTREAM reaches are distinct on the basis of their physical and chemical characteristics. Discharge from Lake Decatur is the primary input to the UPSTREAM reach, resulting in our observation of relatively higher variability in flow and nutrient concentrations. Conversely, stable and predictable instream flows observed in the reach DOWNSTREAM of the SDD facilitate development of more diverse biotic communities. Difference in the overall nature of the UPSTREAM and DOWNSTREAM reaches becomes less distinct during periods of high reservoir discharge.

Collection of diatoms assemblage data has routinely been hampered by disappearance of greater than half of the artificial substrates that were deployed, either through vandalism or natural disturbance. In 2008, all substrates were lost, presumably due to extreme discharges (exceeding 2000 cfs) which occurred immediately following deployment. Loss of the majority of samplers is a drawback to this aspect of the study and efforts are intended for upcoming sampling efforts to evaluate utilization of natural substrates to avoid past difficulties.

Likewise, Hester-Dendy Multiplate samplers which are used for assessment of macroinvertebrate assemblages are subject to loss. For the eleven sampling locations we were only able to collect data from two sites along the stretch of the Sangamon River associated with the Sanitary District of Decatur. A total of 1690 organisms representing 15 macroinvertebrate taxa were collected (Table 3). The observed MBI values were 6.8 and 6.6 for sites 5 and 7, respectively. The highest percent of organisms collected were larval stages of the order Diptera. MBI scores for the 2 main channel sites assessed in 2008 were consistent with MBI values obtained during 1998 and 2001 - 2007. MBI scores averaged over the seven year for UPSTREAM and DOWNSTREAM sites were 7.05 and 5.85, respectively (Table 4). Both of these overall scores warrant a "good/fair rating." However, as reported in 2007, two-factor ANOVA revealed the difference in MBI values to be significant ($p < 0.05$) between upstream and downstream sites, indicating that stream habitat quality is better at the DOWNSTREAM sites.

Stream quality in the Sangamon River basin was evaluated by fish population samples and the Index of Biotic Integrity. A total of 4044 fish representing 19 species from 10 families were collected at 11 sites on 3-4 October (Table 5). As in the previous sample periods the fish community in 2008 again was dominated by the family Cyprinidae (minnows and carp), although significant numbers of gizzard shad and various centrarchids (e.g., sunfish,

bass) also were collected. Stream quality in the Sangamon River basin as evaluated by fish population samples and the Index of Biotic Integrity ranged from 30 (Sites 1) to 40 (Site 3), indicating overall stream quality of poor to good. Overall mean IBIs for data pooled from 1998, 2001-2008 were 31 and 35 for the UPSTREAM and DOWNSTREAM reaches, respectively. Two-factor ANOVA confirmed this difference to be significant ($p < 0.05$), suggesting that overall habitat quality, based on the fish community, is improved in the DOWNSTREAM reach.

During the 2009-2010 contract year, special projects have been developed in consultation with SDD personnel and are being conducted in addition to the routine monitoring activities that have been carried out in years past. One of these is intended to determine the effects of sanitary effluent on benthic algal assemblage structure and productivity using an artificial stream approach. This is intended to allay difficulties we have had involving loss of artificial substrates. A second project is an investigation of the effects of land use and land cover on nutrient loading from subwatersheds that feed into Lake Decatur. This knowledge will be useful for evaluating the contribution of forms of dissolved nitrogen and phosphorus to the Sangamon River via export from Lake Decatur. The third project is an investigation of fish assemblages in these same upstream tributaries as influenced by stream physical and chemical variables. These data will provide a reference for the long term data that we have collected on fish assemblages in the Sangamon River downstream of the reservoir.

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Introduction

Impoundment of rivers to create reservoirs used for irrigation purposes, as urban water supplies, and recreation, is commonplace. However, impoundments may impact downstream aquatic systems and their surrounding terrestrial habitats. Diminished water quality and availability, closures of fisheries, extirpation of species, groundwater depletion, and more frequent and intense flooding are increasingly distinguished as consequences of current river management associated with impoundments (Abramovitz 1996, Collier *et al* 1996, Naiman *et al* 1995). Specifically, dams can affect riverine systems by altering flow regime, changing nutrient and sediment loads, and modifying energy flow (Ligon *et al* 1995). As a result, river reaches downstream from a dam may no longer be able to support native species, which will be reflected by reduced integrity of biotic communities. (Naiman *et al* 1995, NRC 1992).

A natural flow regime is critical for sustaining ecosystem integrity and native biodiversity in rivers (Poff, *et al.* 1997). Dams can have varying effects on downstream aquatic habitats depending on the purpose for which the dam was built. Impoundments used for urban water supplies reduce flow rates below the dam throughout the entire year (Finlayson *et al.* 1994) as well as increased daily and seasonal variability in flow regime (Finlayson *et al.* 1994, McMahon & Finlayson 2003). In addition, abiotic variables including temperature, dissolved oxygen, turbidity, pH, conductivity and solids concentrations are altered in the downstream river system (e.g., (Finlayson *et al.* 1994).

Along with stream impoundments, point source and non-point source pollution can have profound effects on the ecological integrity of river systems. Non-point sources of pollution may include agriculture, livestock grazing, and urbanization while sanitary discharge and industrial waste are examples of point source pollution. To reduce point source pollution, the Water Quality Act of 1972 encouraged wastewater treatment plants to upgrade their systems and, as a result, many communities were forced to build advanced tertiary water treatment facilities (Karr *et al* 1985). Yet these treatment facilities still export high concentrations of nutrients into rivers. Carpenter and Waite (2000) documented that concentrations of phosphorus were highest in streams draining agricultural basins and at sites influenced by wastewater discharges, while Twichell *et al* (2002) reported that sewage effluent inputs had elevated nitrate levels. These enhanced nutrient inputs can be expected to increase productivity within a river because primary productivity and detrital processing usually are limited by low ambient stream nutrient concentrations (Stockner and Shortreed 1978, Elwood *et al* 1981, Winterbourn 1990).

Physical habitat (e.g., flow regime, bottom substrate composition, instream cover, etc.) and chemical water quality must be suitable for support of individual species in lotic systems and maintenance of the integrity of aquatic communities. The

Sangamon River offers an opportunity to study these relationships in a stream influenced by impoundment as well as point source discharges. The Sangamon River Basin is a 14,000 km² watershed covering all or portions of eighteen counties in central Illinois. More than 3540 km of streams within the basin course through glacial and alluvial deposits creating typically low gradient stream with sand and gravel substrates. Streams within the basin have been impacted for most of the past century, receiving inputs from both point and non-point sources. Current land use is 80% agricultural of which 85% is corn or soybeans. The great expanses of prairie that once existed in Illinois have been reduced to isolated hill and sand prairies coupled with remnants along highway and railroad right-of-ways and native deciduous woodlands now are limited to stream riparian areas. Major metropolitan areas associated with the Sangamon River are Bloomington, Decatur, and Springfield representing a combined population of more than 500,000 residents. Impoundments associated with urbanization include Lake Taylorville, Lake Sangchris, and Lake Springfield on the South Fork of the Sangamon; Clinton Lake on Salt Creek; as well as Lake Decatur.

With such influential factors at play, the status of the biotic integrity of the Sangamon River system is constantly in flux. In 1998-99 and continuing from 2001-2006, an intensive sampling program was initiated to document temporal and spatial heterogeneity of an 8.5 km urban reach of the Sangamon River beginning just below the Lake Decatur Dam and extending downstream to incorporate discharges from the Sanitary District of Decatur (SDD). This study has been intended to characterize stream habitat quality and to assess impacts resulting from ongoing municipal and reservoir management by evaluating biotic integrity at various trophic levels in the context of the physical and chemical nature of the Sangamon River.

Project History

We utilize sampling locations associated with operation of SDD that were easily identified by prominent landmarks within the City of Decatur, Illinois, USA (Table 1). Sites were established initially in 1998 during an assessment of potential impacts of discharges from combined sewage overflow (CSO) facilities as well as the main treatment plant. All sites were located in the mainstem of the Sangamon River extending from just downstream of the dam, which impounds Lake Decatur to the Wyckles Road Bridge on the west edge of Decatur. Sites 1, 3, 4, 5, 6, 7, and 8 are within the UPSTREAM reach extending from the dam to the discharge of the main treatment plant, and Sites 9, 11 and 12 are located in the DOWNSTREAM reach which extends from the main treatment plant discharge to the Wyckles Road Bridge. Throughout this report, we will refer to general locations as either UPSTREAM or DOWNSTREAM of the SDD main treatment plant discharge. During 2003, samples also were collected from the Sangamon River at an additional DOWNSTREAM site (#14) located 1km north of the intersection of CR 600E and

CR 800N, near the Lincoln Trail Homestead State Park. Site 2 (an open channel entering the Sangamon River from the Lincoln Park CSO) and Site 10 (located in Stevens Creek in Fairview Park) are distinct from other sites largely due to their location outside of the mainstem of the Sangamon River. Because these Sites are more or less isolated from reservoir or sanitary discharges, they are not included in sample protocol after 2003.

The Stream Habitat Assessment Procedure (SHAP), which evaluates lotic habitat quality using features considered important to biotic integrity, was performed by us during the month of July in 1998, 2001, and 2002 through 2006. At each stream site, two individuals independently assigned metrics related to substrate and instream cover, channel morphology and hydrology, and riparian and bank features to one of four habitat quality types using guidelines established by the Illinois Environmental Protection Agency (1994). The mean total score of the 15 metrics forms the basis of an overall habitat quality rating for the stream reach under consideration. Habitat quality of the UPSTREAM and DOWNSTREAM reaches were categorized on the basis of its SHAP score as follows: <59 = Very Poor; 59 - 100 = Fair; 100 - 142 = Good; > 142 = Excellent. Average SHAP scores for UPSTREAM and DOWNSTREAM sites were 84 and 95, respectively. Nonetheless, physical habitat structure based on SHAP still results in classification of all mainstem sites as "fair" quality stream reaches indicating that the physical structure of the stream is homogeneous.

This overall physical structure provides a backdrop for the ability of the study reach to support a diverse flora and fauna. Routine assessment of characteristic water quality variables superimposed on substrate characteristics, channel morphology and bank features can aid in understanding the functioning of stream systems. Given that organisms exist within often-narrow ranges of tolerance for certain physical and chemical characteristics of their environment, analysis of these variables is imperative for understanding the potential for anthropogenic impacts to decrease biotic integrity of natural systems. As a result, we incorporated routine analyses of various physical and chemical features of the Sangamon River sites studied since 2002, which based on principal components analysis, revealed significant differences between the UPSTREAM and DOWNSTREAM reaches. Monitoring of relevant variables continues through 2008.

Qualitative judgements (good vs. bad) based on established biocriteria using data from 1998, 2000 -2008 were consistent. The Macroinvertebrate Biotic Index classified both reaches as GOOD/FAIR, however, the MBI downstream was significantly different from the upstream MBI, indicating conditions significantly improved DOWNSTREAM of the discharge from the SDD main treatment. And the Fish Index of Biotic Integrity calculated from 1998, 2001 through 2007 classified both reaches as FAIR, but was able to detect a significant difference between stream reaches with improved habitat DOWNSTREAM of the discharge from the SDD main treatment. Since 2002 we have attempted to refine our sampling protocol for

development of benthic algae for monitoring stream habitat quality. Indices of diatom community structure did not differ between UPSTREAM and DOWNSTREAM reaches based on analysis of spring and fall sample periods. However, qualitative comparisons of shifts in community dominance were possible and clearly indicated promise for utility of these organisms for biomonitoring stream conditions.

Methods

Field data collection and water chemistry determination

Water quality data were collected on nine occasions from May, 2008 to March, 2009. Sampling was initiated at the Lake Decatur dam and proceeded downstream. While in the field, additional abiotic variables (dissolved oxygen, pH, conductivity, and temperature) were determined using a Eureka Amphibian and Manta multiprobe. Surface water samples were collected at 0.3 m below the surface and returned to the laboratory on ice and analyzed within generally accepted time limits. All sampling and analyses were conducted according to Standard Methods for Examination of Water and Wastewater (APHA, 1995). In the laboratory, suspended and total solids determinations were made by drying residue collected on standard glass fiber filters as well as unfiltered samples placed into tared porcelain crucibles at 103–105 °C. Total dissolved solids were calculated by difference. Total phosphorus (following persulfate digestion) and soluble reactive phosphorus (utilizing filtered, undigested, sample aliquots) were determined using the ascorbic acid method. The phenate method was used for determination of ammonia nitrogen, and total oxidized nitrogen ($\text{NO}_2\text{-N} + \text{NO}_3\text{-N}$) was determined via the cadmium reduction method. Colorimetry of all nutrient analyses was determined using a Beckman DU 530 Life Science UV/Vis Spectrophotometer. Alkalinity and hardness were measured by titration to colorimetric endpoint methods. For all chemical analyses, due consideration was given to quality control and quality assurance procedures, including but not limited to parallel analyses of laboratory standards.

Macroinvertebrates

As in past years, we attempted to collect macroinvertebrate samples using modified multiplate samplers (Hester and Dendy 1962). Substrates were placed on the stream bottom for periods of six weeks, beginning 27 June, 2008 to allow colonization. All but two samplers were lost, likely due to high stream discharge (although vandalism remains as a potential source of disruption). Samplers which were located at Sites 5 and 7 on 8 August 2008 were collected with aid of a dip-net, in order to avoid loss of invertebrates, and placed in wide-mouth plastic containers. All organisms were preserved in the field with 95% ethanol containing rose bengal. After sorting, macroinvertebrates were identified to the lowest possible taxonomic level and data

were used to calculate a Macroinvertebrate Biotic Index (MBI) according to Hilsenhoff (1982). In this method, each taxon is assigned a pollution tolerance value ranging from zero to eleven based on available literature and previous field experience. Based on present assessment methods, MBI values reflect water quality as follows (IEPA 1988): < 5.0 - Excellent; 5.0 - 6.0 - Very good; 6.1 - 7.5 - Good/Fair; 7.6 - 10.0 - Poor; > 10.0 - Very Poor. Macroinvertebrate Biotic Index scores for 2007 were compared to those data, which were pooled from 1998, 2001 through 2006.

Fish

Fish were sampled on 3-4 October 2008 by hand seining, with attempts to standardize sampling effort at each site. Fish were identified to species, counted and returned to the stream alive when possible, although voucher specimens were preserved and retained. When field identifications were not practical, specimens were preserved in ten percent formalin and returned to the laboratory. Fish community data were used to determine the community-based Index of Biotic Integrity (IBI), which uses twelve metrics in three categories to appraise fish communities (Karr et al., 1986). Values of 1, 3, and 5 are assigned for each metric, and the values for the individual metrics are then summed to generate a score from 12 to 60. Calculation of IBI values was aided by an interactive program written in Basic for use on an IBM-PC (Bickers et al., 1988). The utility of IBI scores is that they enable qualitative characterization of streams, as follows: 51-60 – excellent; comparable to best situations without human disturbance, 41-50.9 – good; good fishery for gamefish; species richness may be below expectations, 31-40.9 – fair; bullheads, sunfish, and carp predominate; diversity and intolerants reduced, 21-30.9 – poor; fish dominated by omnivores and tolerant forms; diversity notably reduced, <21 – very poor; few fish of any species present, no sport fishery exists. Fish IBI scores for 2007 were compared to those data, which were pooled from 1998, 2001 and 2002 through 2006.

Benthic algal (diatom) samples

Artificial substrates were deployed at 11 sites in the main channel of the Sangamon River beginning 24 June, 2008. Substrates were 1 x 3 inch clean glass microscope slides suspended at the surface of the stream in commercially available periphytometers (Wildco, Inc.). Difficulties with this sampling protocol were similar, but more severe than that realized in previous years, as substrates were lost at all sites due either to natural occurrence (i.e., high discharge events) or due to vandalism. As such, analysis of diatom assemblages was not possible.

Results

Water chemistry

Levels of 13 separate water quality variables were determined for eleven mainstem sites in 2008 (Table 2). The trend established in prior sampling years continued throughout this recent sampling period, with levels for each of the variables being generally higher in DOWNSTREAM locations. Most notably, higher concentrations of forms of phosphorus and nitrogen were observed along with a general trend of elevated conductivity, presumably resulting from discharge from the main treatment plant of the Sanitary District of Decatur. Water chemistry continued to be relatively homogeneous over the entire study reach during periods of high discharge from the dam which impounds Lake Decatur.

Macroinvertebrates

Although a total of 11 Hester-Dendy Multiplate samplers were placed along the main stem of the Sangamon River associated with the Sanitary District of Decatur for determination of macroinvertebrate communities, only two of the samplers were recovered following a 6-week exposure period. A total of 1690 organisms representing 15 macroinvertebrate taxa were collected (Table 3). The observed MBI values were 6.8 and 6.6 for sites 5 and 7, respectively. The highest percent of organisms collected were larval stages of the order Diptera. MBI scores for the 2 main channel sites assessed in 2008 were consistent with MBI values obtained during 1998 and 2001 - 2007. MBI scores averaged over the seven year for UPSTREAM and DOWNSTREAM sites were 7.05 and 5.85, respectively (Table 4). Both of these overall scores warrant a "good/fair rating." However, as reported in 2007, two-factor ANOVA revealed the difference in MBI values to be significant ($p < 0.05$) between upstream and downstream sites, indicating that stream habitat quality is better at the DOWNSTREAM sites.

Fish

A total of 4044 fish representing 19 species from 10 families were collected at 11 sites on 3-4 October (Table 5). As in the previous sample periods the fish community in 2008 again was dominated by the family Cyprinidae (minnows and carp), although significant numbers of gizzard shad and various centrarchids (e.g., sunfish, bass) also were collected. Stream quality in the Sangamon River basin as evaluated by fish population samples and the Index of Biotic Integrity ranged from 30 (Sites 1) to 40 (Site 3), indicating overall stream quality of poor to good. Overall mean IBIs for data pooled from 1998, 2001-2008 were 31 and 35 for the UPSTREAM and DOWNSTREAM reaches, respectively. Two-factor ANOVA confirmed this difference to be significant ($p < 0.05$), suggesting that overall habitat quality, based on the fish community, is improved in the DOWNSTREAM reach.

Discussion

Overall, the Sangamon River extending from the dam, which impounds Lake Decatur to the Wyckles Road Bridge, can be considered a fair quality aquatic system with minimal habitat variety. Although there is significant variation in physical habitats UPSTREAM and DOWNSTREAM of the SDD, variability in SHAP ratings were primarily dependent upon such factors as substrate stability, pool variability and quality due to stream flow, and loss or reduction of riparian zone vegetation that had occurred at each specific site. The primary difference between UPSTREAM and DOWNSTREAM reaches is attributable indirectly to metrics related to flow. The DOWNSTREAM reach receives continuous flow from SDD, whereas UPSTREAM flow varies greatly due to unpredictable reservoir discharges. Such alterations have lead to simplification of stream habitat with concomitant reduction in species diversity and biotic integrity and an overall decline in quality of the aquatic resource.

Based on physical habitat structure as measured by SHAP, the reaches of the Sangamon River, which we studied, are indistinguishable. However, past detailed analyses have shown that UPSTREAM and DOWNSTREAM reaches are distinct on the basis of their physical and chemical characteristics. Discharge from Lake Decatur is the primary input to the UPSTREAM reach, resulting in our observation of relatively higher variability in flow and nutrient concentrations. Conversely, stable and predictable instream flows observed in the reach DOWNSTREAM of the SDD facilitate development of more diverse biotic communities as confirmed by work conducted in other riverine systems (Sanders 1969; Fisher 1983; Peckarsky 1983; Reice 1985; Ross *et al.* 1985; Walde 1986; Resh *et al.* 1988). Difference in the overall nature of the UPSTREAM and DOWNSTREAM reaches becomes less distinct during periods of high reservoir discharge.

We also believe that drastic reduction of instream flow resulting by routine elimination of reservoir discharge is detrimental to habitat quality in the UPSTREAM reach. We previously have suggested that a threshold exists with respect to flow, i.e. periods when discharge is less than 400 cfs. When flow is below this threshold, the UPSTREAM and DOWNSTREAM reaches are discrete, while they appear to behave as a continuum when discharge exceeds 400 cfs. This suggests that water quality is compromised in the reach of the Sangamon River extending downstream from the dam to the discharge of the main treatment plant of the Sanitary District of Decatur as a result of management to maintain reservoir levels by eliminating outflow. In contrast, effective management of Sangamon River may require maintenance of instream flow above the proposed threshold (400 cfs) by continuous discharge from Lake Decatur.

Sites DOWNSTREAM of SDD may have greater potential for instream primary productivity as a result of nutrient loading as indexed by higher levels of dissolved solids, conductivity, total alkalinity, oxidized nitrogen, and phosphorus. We believe

that suspended organic material including phytoplankton algae derived from the reservoir may be supporting heterotrophs in the UPSTREAM sites. In contrast, DOWNSTREAM sites are maintained by autochthonous primary productivity that is supported by relatively higher concentrations of plant nutrients derived from the sanitary discharge. We conclude that SDD discharge may be facilitating a shift from a stream system that relies on allochthonous input of algae to one that relies on autochthonous instream primary productivity.

Qualitative evaluation of the two stream reaches requires assessment of stream biota to determine whether or not differences in the two stream reaches are reflected by higher trophic levels. Such an evaluation of overall stream habitat quality can be made via biotic indices involving macroinvertebrates and fish, taxa that have become widely used for biotic assessments. DOWNSTREAM sites were characterized during 1998, 2001-2008 by significantly lower MBI scores and higher IBI values, indicative of improved habitat quality capable of supporting diverse biota and a variety of different trophic levels. DOWNSTREAM sites associated with the main treatment plant outfall from the SDD may have increased integrity due to predictable instream flows and increased autochthonous primary production due in part to nutrient loading.

When comparing our observations made during the 2008 sampling period with data collected in 1992 (IEPA report), 1998 (Sanitary District of Decatur) and 2001-2007 (Sanitary District of Decatur) both IBI and MBI values for DOWNSTREAM sites associated with the main treatment plant outfall were generally similar or slightly improved compared to values obtained during all previous sampling periods. Thus the upgrades performed to the main plant in 1990 and the Lincoln CSO in 1992 by the sanitation district have lead direct to improvement of the water quality of the Sangamon River which has been maintained over the past eight years. Additionally, there has been no reduction in the quality of the Sangamon River section located near the Sanitary District of Decatur in the last 20 years.

The 2008 sampling season was fraught with difficulties associated with frequent and extended high discharges from Lake Decatur (Figure 1). Artificial substrates for collection of benthic diatoms and macroinvertebrates were deployed on 27 June 2008, which was the first instance during the summer sampling period when discharge was at a level which would permit deployment. Unfortunately, due to high precipitation, discharge from the reservoir was elevated to over 2000 cfs from 9-16 July 2008, with a peak discharge of 5530 on 12 July 2008. We have little doubt that these extreme flows resulted in the loss of all floating periphyton samplers and all but 2 of the Hester-Dendy plate samplers for macroinvertebrates.

During the 2009-2010 contract year, special projects have been developed in consultation with SDD personnel and are being conducted in addition to the routine monitoring activities as have been carried out in years past. These projects, which have been ongoing since implementation began in March, 2009, are the focus of 3

M.S. theses in the Department of Biological Sciences at EIU. One of these is intended to determine the effects of sanitary effluent on benthic algal assemblage structure and productivity using an artificial stream approach. This is intended to allay difficulties we have had involving loss of artificial substrates. A second project is an investigation of the effects of land use and land cover on nutrient loading from subwatersheds that feed into Lake Decatur. This knowledge will be useful for evaluating the contribution of forms of dissolved nitrogen and phosphorus to the Sangamon River via export from Lake Decatur. The third project is an investigation of fish assemblages in these same upstream tributaries as influenced by stream physical and chemical variables. These data will provide a reference for the long term data that we have collected on fish assemblages in the Sangamon River downstream of the reservoir.

Table 1. List of the 13 sites utilized by the Department of Biological Sciences for studies conducted on reaches of the Sangamon River associated with the Sanitary District of Decatur.

Site #1 - Lincoln Park - above outfall
Site #2 - Lincoln Park - outfall canal
Site #3 - Lincoln Park - below outfall
Site #4 - Oakland (Lincoln Park Drive) - above outfall
Site #5 - Oakland (Lincoln Park Drive) - below outfall
Site #6 - 7 th Ward - upstream of outfall
Site #7 - 7 th Ward - downstream of outfall
Site #8 - SDD Main Treatment Plant - upstream of main outfall
Site #9 - SDD Main treatment Plant - downstream of main outfall
Site #10 - Stevens Creek in Fairview Park
Site #11 - Sangamon River - downstream of Stevens Creek
Site #12 - Sangamon River at Wyckles Road
Site # 14 - near the Lincoln Trail Homestead State Park, 1km north of CR 600E and CR 800N

Table 2. Measured water quality variables for 11 mainstem sites in the Sangamon River associated with the SDD.

Date	Location	D.O.	Temp.	pH	Cond	Hardness	total		TON	NH4	PO ₄ TP	PO ₄ - SRP	TSS (ppm)	TS(ppm)	TDS (ppm)
							Alkalinity								
05.09.08	1	11.4	16.5	8.4	542.0	287.8	195.4		5.00	0.07	0.09	0.03	24.0	380.0	356.0
07.10.08	1	8.1	26.4	8.0	526.0	265.3	265.2		4.30	0.15	0.23	0.04	31.3	337.3	306.0
08.12.08	1	8.0	25.8	9.0	472.0	228.6	293.2		1.30	0.11	0.16	0.02	22.2	306.7	284.4
09.09.08	1	8.7	22.6	8.1	384.0	200.0	195.4		0.82	0.00	0.03	0.23	30.7	228.0	197.3
10.21.08	1	11.2	16.0	8.4	499.0	363.3	279.2		2.78	0.06	0.16	0.03	22.4	324.0	301.6
11.03.08	1	13.0	12.1	8.7	581.0	326.5	307.1		2.72	0.06	0.31	0.07	17.2	392.0	374.8
01.20.09	1	15.1	1.5	9.3	641.0	338.8	307.1		0.05	0.14	0.15	0.12	8.3	397.3	389.0
02.25.09	1	15.3	1.7	8.4	559.0	286.7	307.1		6.18	0.15	0.18	0.10	21.3	397.3	376.0
03.30.09	1	12.6	9.9	8.6	534.0	275.0	279.2		5.23	0.01	0.15	0.05			
AVERAGE		11.5	14.7	8.5	526.4	285.8	269.9		3.2	0.1	0.2	0.1	22.2	345.3	323.1
number		9	9	9	9	9	9		9	9	9	9	8	8	8
05.09.08	3	10.2	16.5	8.5	542.0	328.6	293.2		4.98	0.02	0.10	0.03	25.5	376.0	350.5
07.10.08	3	8.1	26.4	8.1	527.0	265.3	251.3		4.60	0.18	0.16	0.07	42.7	340.0	297.3
08.12.08	3	8.4	25.9	9.0	474.0	228.6	237.3		1.11	0.11	0.23	0.02	27.0	314.7	287.7
09.09.08	3	8.5	22.5	8.1	386.0	195.9	181.5		0.85	0.00	0.07	0.20	26.0	264.0	238.0
10.21.08	3	10.6	16.0	8.4	500.0	318.4	265.2		2.57	0.03	0.18	0.01	18.8	318.7	299.9
11.03.08	3	12.7	12.0	8.6	581.0	326.5	321.1		2.66	0.08	0.29	0.08	14.8	386.7	371.9
01.20.09	3	14.9	1.5	9.3	642.0	351.0	307.1		0.06	0.03	0.16	0.12	9.6	396.0	386.4
02.25.09	3	15.6	1.7	8.1	560.0	286.7	258.3		5.56	0.11	0.19	0.10	35.7	408.0	372.3
03.30.09	3	12.1	9.8	8.6	535.0	286.7	265.2		5.15	0.14	0.17	0.05			
AVERAGE		11.2	14.7	8.5	527.4	287.5	264.5		3.1	0.1	0.2	0.1	25.0	350.5	325.5
number		9	9	9	9	9	9		9	9	9	9	8	8	8

Table 2. (cont.)

total														
Date	Location	D.O.	Temp.	pH	Cond	Hardness	Alkalinity	TON	NH4	PO ₄ TP	PO ₄ - SRP	TSS (ppm)	TS(ppm)	TDS (ppm)
05.09.08	4	10.3	16.4	8.5	550.0	310.2	146.6	5.00	0.07	0.09	0.03	25.0	376.0	351.0
07.10.08	4	7.9	26.5	8.1	525.0	263.3	265.2	6.61	0.20	0.20	0.05	44.7	348.0	303.3
08.12.08	4	8.6	25.5	8.9	474.0	232.7	251.3	0.90	0.08	0.23	0.02	75.4	397.3	321.9
09.09.08	4	9.2	22.6	8.1	394.0	212.2	195.4	0.87	0.00	0.06	2.31	25.3	285.3	260.0
10.21.08	4	10.6	15.9	8.3	515.0	314.3	265.2	2.65	0.12	0.15	0.01	16.0	333.3	317.3
11.03.08	4	12.9	12.2	8.5	581.0	342.9	307.1	2.78	0.03	0.28	0.07	14.0	401.3	387.3
01.20.09	4	14.7	1.5	9.0	644.0	351.0	293.2	0.05	0.13	0.16	0.11	10.6	409.3	398.7
02.25.09	4	14.8	1.9	8.2	560.0	292.6	265.2	5.63	0.12	0.18	0.10	21.7	406.7	385.0
03.30.09	4	12.4	10.0	8.5	537.0	278.9	251.3	4.85	0.04	0.14	0.05			
AVERAGE		11.3	14.7	8.5	531.1	288.7	249.0	3.3	0.1	0.2	0.3	29.1	369.7	340.6
number		9	9	9	9	9	9	9	9	9	9	8	8	8

05.09.08	5	10.3	16.4	8.5	547.0	287.8	314.1	5.63	0.05	0.09	0.03	21.3	378.7	357.3
07.10.08	5	7.9	26.5	8.2	525.0	265.3	286.2	4.90	0.20	0.21	0.08	50.0	341.3	291.3
08.12.08	5	8.2	25.5	9.0	488.0	228.6	223.4	1.51	0.11	0.16	0.03	33.7	338.7	305.0
09.09.08	5	8.7	22.7	8.1	394.0	204.1	181.5	0.82	0.00	1.05	0.15	34.7	280.0	245.3
10.21.08	5	10.3	16.0	8.4	508.0	318.4	265.2	2.67	0.12	0.15	0.02	19.2	265.3	246.1
11.03.08	5	12.2	13.4	8.5	583.0	326.5	307.1	2.88	0.07	0.29	0.07	16.4	389.3	372.9
01.20.09	5	15.0	1.5	9.0	651.0	334.7	307.1	0.06	0.13	0.17	0.09	13.0	405.3	392.3
02.25.09	5	14.5	1.9	8.2	566.0	275.0	251.3	5.97	0.16	0.19	0.10	22.7	412.0	389.3
03.30.09	5	12.1	10.0	8.5	536.0	278.9	251.3	5.11	0.04	0.13	0.05			
AVERAGE		11.0	14.9	8.5	533.1	279.9	265.2	3.3	0.1	0.3	0.1	26.4	351.3	325.0
number		9	9	9	9	9	9	9	9	9	9	8	8	8

Table 2. (cont.)

total														
Date	Location	D.O.	Temp.	pH	Cond	Hardness	Alkalinity	TON	NH4	PO ₄ TP	PO ₄ - SRP	TSS (ppm)	TS(ppm)	TDS (ppm)
05.09.08	6	10.2	16.3	8.4	559.0	289.8	237.3	5.13	0.05	0.07	0.03	22.8	392.0	369.2
07.10.08	6	7.9	26.5	8.2	526.0	277.5	258.3	8.28	0.16	0.19	0.05	46.7	338.7	292.0
08.12.08	6	8.1	25.4	8.9	483.0	228.6	265.2	1.43	0.04	0.18	0.01	28.6	345.3	316.8
09.09.08	6	8.8	22.8	8.1	398.0	200.0	195.4	0.80	0.00	0.15	0.06	29.3	285.3	256.0
10.21.08	6	10.6	16.1	8.4	506.0	273.5	279.2	2.67	0.11	0.14	0.01	18.3	270.7	252.3
11.03.08	6	13.0	12.3	8.5	584.0	326.5	293.2	3.02	0.07	0.30	0.07	15.2	397.3	382.1
01.20.09	6	14.8	1.4	9.0	651.0	334.7	293.2	0.05	0.15	0.17	0.10	12.4	408.0	395.6
02.25.09	6	14.2	2.0	8.5	564.0	280.9	293.2	5.91	0.15	0.24	0.09	22.3	429.3	407.0
03.30.09	6	12.1	10.1	8.5	540.0	286.7	251.3	4.99	0.02	0.12	0.05			
AVERAGE		11.1	14.7	8.5	534.6	277.6	262.9	3.6	0.1	0.2	0.1	24.5	358.3	333.9
number		9	9	9	9	9	9	9	9	9	9	8	8	8

05.09.08	7	11.4	16.2	8.7	498.0	273.5	244.3	5.30	0.05	0.07	0.03	28.4	352.0	323.6
07.10.08	7	7.9	26.6	8.1	525.0	269.4	279.2	6.69	0.17	0.18	0.05	49.3	333.3	284.0
08.12.08	7	7.8	24.8	8.8	506.0	244.9	223.4	1.03	0.10	0.21	0.02	36.0	368.0	332.0
09.09.08	7	8.8	22.9	8.0	399.0	224.5	181.5	0.92	0.00	0.05	0.18	34.0	290.7	256.7
10.21.08	7	10.4	15.7	8.3	508.0	314.3	293.2	2.63	0.18	0.16	0.01	16.3	334.7	318.4
11.03.08	7	12.8	12.3	8.5	581.0	330.6	293.2	2.72	0.06	0.29	0.08	20.0	408.0	388.0
01.20.09	7	14.6	0.9	9.0	652.0	346.9	321.1	0.05	0.21	0.17	0.11	11.4	425.3	413.9
02.25.09	7	14.2	1.9	8.5	566.0	292.6	265.2	5.91	0.17	0.19	0.09	24.0	425.3	401.3
03.30.09	7	12.1	10.2	8.6	539.0	290.7	265.2	4.81	0.01	0.12	0.04			
AVERAGE		11.1	14.6	8.5	530.4	287.5	262.9	3.3	0.1	0.2	0.1	27.4	367.2	339.7
number		9	9	9	9	9	9	9	9	9	9	8	8	8

Table 2. (cont.)

Date	Location	D.O.	Temp.	pH	Cond	Hardness	total		TON	NH4	PO ₄ TP	PO ₄ - SRP	TSS (ppm)	TS(ppm)	TDS (ppm)
							Alkalinity								
05.09.08	8	11.3	16.2	8.7	501.0	249.0	209.4		4.22	0.03	0.08	0.03	18.0	348.0	330.0
07.10.08	8	7.9	26.6	8.2	525.0	540.8	251.3		13.79	0.18	0.17	0.07	55.3	348.0	292.7
08.12.08	8	7.4	24.4	8.8	518.0	257.1	293.2		1.72	0.02	0.19	0.02	31.0	372.0	341.0
09.09.08	8	8.7	22.8	8.0	400.0	183.7	181.5		0.91	0.00	0.04	0.20	32.0	302.7	270.7
10.21.08	8	10.2	15.6	8.3	508.0	293.9	265.2		2.72	0.04	0.16	0.01	16.5	330.7	314.2
11.03.08	8	12.8	12.5	8.6	579.0	322.4	293.2		2.40	0.05	0.30	0.07	18.0	397.3	379.3
01.20.09	8	14.4	1.0	9.0	652.0	330.6	293.2		0.05	0.17	0.16	0.11	12.7	418.7	406.0
02.25.09	8	14.2	2.0	8.3	566.0	296.6	265.2		5.84	0.17	0.19	0.09	22.4	424.0	401.6
03.30.09	8	12.4	10.3	8.7	539.0	286.7	251.3		5.23	0.05	0.12	0.05			
AVERAGE		11.0	14.6	8.5	532.0	306.8	255.9		4.1	0.1	0.2	0.1	25.7	367.7	341.9
number		9	9	9	9	9	9		9	9	9	9	8	8	8

Table 2. (cont.)

Date	Location	D.O.	Temp.	pH	Cond	Hardness	total		TON	NH4	PO ₄ TP	PO ₄ - SRP	TSS (ppm)	TS(ppm)	TDS (ppm)
							Alkalinity								
05.09.08	9	11.1	16.8	8.5	736.0	263.3	237.3		5.38	0.41	0.92	0.88	16.0	458.7	442.7
07.10.08	9	7.9	26.6	8.2	541.0										
08.12.08	9	7.5	25.9	8.6	15.3	285.7	279.2		4.62	0.11	2.69	2.25	23.0	1014.7	991.7
09.09.08	9	8.1	23.7	7.9	798.0	187.8	209.4		3.46	0.00	1.44	0.82	26.7	490.7	464.0
10.21.08	9	9.8	17.6	8.2	1180.0	346.9	363.0		6.49	0.12	1.79	1.71	14.5	656.0	641.5
11.03.08	9	11.5	15.0	8.4	1183.0	355.1	307.1		6.40	0.04	2.64	3.36	18.8	706.7	687.9
01.20.09	9	13.2	2.9	8.9	1002.0	351.0	321.1		0.06	0.20	1.22	1.26	10.3	621.3	611.0
02.25.09	9	13.9	3.7	8.3	842.0	308.3	279.2		7.20	0.14	1.24	1.24	22.4	548.0	525.6
03.30.09	9	11.9	11.0	8.5	749.0	310.3	265.2		5.81	0.08	0.81	0.79			
AVERAGE		10.5	15.9	8.4	782.9	301.1	282.7		4.9	0.1	1.6	1.5	18.8	642.3	623.5
number		9	9	9	9	8	8		8	8	8	8	7	7	7
05.09.08	11	11.0	16.7	8.5	738.0	271.4	216.4		6.39	0.33	0.93	1.19	14.7	486.7	472.0
07.10.08	11	8.0	26.3	8.2	596.0	279.6	251.3		6.61	0.25	0.53	0.41	46.9	420.0	373.1
08.12.08	11	8.1	25.7	8.7	1520.0	342.9	321.1		3.66	0.01	2.48	2.44	26.5	1097.3	1070.8
09.09.08	11	8.8	24.0	7.9	1011.0	232.7	223.4		4.58	0.00	1.78	1.26	30.0	640.0	610.0
10.21.08	11	10.4	17.3	8.2	1074.0	253.1	335.0		6.72	0.13	2.17	1.66	13.6	674.7	661.1
11.03.08	11	12.0	14.1	8.4	958.0	342.9	321.1		6.33	0.06	2.50	2.67	29.4	683.7	654.1
01.20.09	11	13.8	4.2	8.9	1184.0	334.7	321.1		0.05	0.16	1.44	1.46	13.1	712.0	698.9
02.25.09	11	13.4	3.8	8.4	831.0	312.3	279.2		7.65	0.14	1.33	1.37	21.7	564.0	542.3
03.30.09	11	11.9	10.9	8.4	703.0	294.6	265.2		6.28	0.06	0.68	0.69			
AVERAGE		10.8	15.9	8.4	957.2	296.0	281.5		5.4	0.1	1.5	1.5	24.5	659.8	635.3
number		9	9	9	9	9	9		9	9	9	9	8	8	8

Table 2. (cont.)

total														
Date	Location	D.O.	Temp.	pH	Cond	Hardness	Alkalinity	TON	NH4	PO ₄ TP	PO ₄ - SRP	TSS (ppm)	TS(ppm)	TDS (ppm)
05.09.08	12	10.5	16.2	8.5	671.0	285.7	328.1	4.99	0.12	0.74	0.67	20.0	449.3	429.3
07.10.08	12	7.9	26.6	8.1	570.0	273.5	230.3	6.09	0.24	0.50	0.36	60.0	430.7	370.7
08.12.08	12	9.7	25.9	8.8	1608.0	281.6	279.2	3.50	0.02	2.34	2.64	26.7	1100.0	1073.3
09.09.08	12	8.7	23.8	7.9	945.0	236.7	223.4	4.58	0.00	2.01	1.21	28.4	640.0	611.6
10.21.08	12	10.1	17.1	8.2	1054.0	330.6	307.1	6.03	0.01	2.10	1.66	14.8	658.7	643.9
11.03.08	12	11.9	14.4	8.5	921.0	346.9	321.1	5.60	0.08	2.61	2.47	17.6	600.0	582.4
01.20.09	12	13.9	3.3	9.0	1080.0	342.9	335.0	0.06	0.22	1.18	1.32	13.0	648.0	635.0
02.25.09	12	13.3	4.0	8.1	813.0	310.3	279.2	7.27	0.16	1.24	1.36	24.4	556.0	531.6
03.30.09	12	12.4	10.9	8.4	694.0	255.3	265.2	6.44	0.12	0.83	0.75			
AVERAGE number		10.9 9	15.8 9	8.4 9	928.4 9	296.0 9	285.4 9	5.0 9	0.1 9	1.5 9	1.4 9	25.6 8	635.3 8	609.7 8

05.09.08	14	10.0	16.2	8.4	642.0	285.7	230.3	5.16	0.05	0.60	0.01	24.3	472.8	448.5
07.10.08	14	7.6	26.5	8.1	564.0	269.4	244.3	5.35	0.21	0.50	0.32	76.7	421.3	344.7
08.12.08	14	9.0	25.0	8.6	2186.0	383.7	349.0	4.01	0.11	2.68	2.85	40.0	1537.3	1497.3
09.09.08	14	8.4	23.0	8.0	782.0	232.7	209.4	3.70	0.00	1.66	1.00	32.8	521.3	488.5
10.21.08	14	10.8	16.6	8.2	1040.0	322.4	335.0	6.45	0.00	2.23	1.41	11.2	660.0	648.8
11.03.08	14	11.7	14.2	8.4	915.0	342.9	307.1	6.30	0.06	2.61	2.53	18.8	610.7	591.9
01.20.09	14	14.1	2.2	9.1	1100.0	363.3	335.0	0.06	0.26	1.14	1.38	11.7	672.0	660.3
02.25.09	14	13.4	3.5	8.2	789.0	322.1	286.2	6.71	0.19	1.27	1.20	23.7	563.7	540.0
03.30.09	14	12.3	10.5	8.4	674.0	294.6	279.2	6.17	0.13	0.87	0.77			
AVERAGE number		10.8 9	15.3 9	8.4 9	965.8 9	313.0 9	286.2 9	4.9 9	0.1 9	1.5 9	1.3 9	29.9 8	682.4 8	652.5 8

Table 3. Macroinvertebrate data collected in 2008-2009 from Sangamon River sample sites associated with the Decatur Sanitation District

order	family	tot value	site 5	site 7
<i>Ephemeroptera</i>	Baetidae	4	22	27
	Caenidae	6	33	38
	Ephemeridae	5	2	
	Heptagenidae	3		
<i>Odonata</i>	Coenagrionidae	6	22	18
	Gomphidae	5		
<i>Trichoptera</i>	Polycentropodidae	6	77	47
<i>Hydropsychidae</i>	Hydropsychide	4		1
<i>Coleoptera</i>	Dryopidae	4		
	Curculionidae	4		4
	Elmidae	5		5
	Haliphilidae	4		3
<i>Diptera</i>	Chironomidae	7	766	586
	Culcidae	8	4	
	Simuliidae	7		
	Ceratopogonidae	5		
	Tipulidae	4		14
	Oligochaeta	8	17	
<i>Mollusks</i>		6	2	
<i>Annelida</i>		10		
<i>Megaloptera</i>		3		
<i>Turbellaria</i>		6		2

Total Number	945	745
# of families	9	11
MBI	6.806	6.648

Table 4. Mean MBI Scores for Sangamon River sites upstream and downstream of the main discharge from the Sanitary District of Decatur Treatment Plant

Year	Upstream Reach	Downstream Reach
1998	7.5	5.6
2001	7.3	5.9
2002	7.7	6.2
2003	7.1	5.6
2004	6.3	6.1
2005	6.8	5.7
2006	6.9	5.9
2007	6.8	5.8
2008	6.7	—
overall mean	7.0	5.9

Electronic Filing: Received, Clerk's Office 11/30/2017

Table 5. Fish data collected at 11 sites in the Sangamon River for the Sanitary District of Decatur.

Common Name	Scientific Name	site 1	site 3	site 4	site 5	site 6	site 7	site 8	site 9	site 11	site 12	site 14
Freshwater Drum	<i>Aplodinotus grunniens</i>											
Quillback	<i>Cariodes cyprinus</i>	8	7					3				
White Sucker	<i>Catostomus commersoni</i>											
Red Shiner	<i>Cyprinella lutrensis</i>	9		545	108	129	3	44	453	133	2	78
Spotfin Shiner	<i>Cyprinella spiloptera</i>											
Steelcolor Shiner	<i>Cyprinella whipplei</i>		89	4								
Carp	<i>Cyprinus carpio</i>		1									
Gizzard Shad	<i>Dorosoma cepedianum</i>	49	86	1114	2	7	0	8	32	12	3	3
Johnny Darter	<i>Etheostoma nigrum</i>				1					1	1	
Orangethroat Darter	<i>Etheostoma spectabile</i>			2				1			2	1
Blackstripe Topminnow	<i>Fundulus notatus</i>	1									2	
Mosquitofish	<i>Gambusia affinis</i>	17	26		3	9		4			32	2
Northern Hogsucker	<i>Hypentelium nigricans</i>											
Channel Catfish	<i>Ictalurus punctatus</i>			1					5			
Brook Silverside	<i>Labidesthes sicculus</i>	13	129					6			3	11
Shortnose Gar	<i>Lepisosteus platostomus</i>											
Green Sunfish	<i>Lepomis cyanellus</i>		1				1				1	
Pumpkinseed	<i>Lepomis gibbosus</i>											
Orangespotted Sunfish	<i>Lepomis humilis</i>	13	49									
Bluegill	<i>Lepomis macrochirus</i>	100	185	3	14	6	1	89			38	
Redear Sunfish	<i>Lepomis microlophus</i>											
Striped Shiner	<i>Luxilus chrysocephalus</i>											
Redfin Shiner	<i>Lythrurus umbratilis</i>											
Spotted Bass	<i>Micropterus punctulatus</i>	1	1					1				
Largemouth Bass	<i>Micropterus salmoides</i>		1									
Striped Bass	<i>Morone saxatilis</i>											
Golden Redhorse	<i>Moxostoma erythrurum</i>											
Golden Shiner	<i>Notemigonus crysoleucas</i>		10					1			1	
Spotfin Shiner	<i>Notropis spilopterus</i>		83	1								
Sand Shiner	<i>Notropis stramineus</i>		2	8	1	1		8	58	53		5
Tadpole Madtom	<i>Noturus gyrinus</i>										1	
Blackside Darter	<i>Percina maculata</i>	1										
Logperch	<i>Percina caprodes</i>		1									1
Blackside Darter	<i>Percina maculata</i>											
Slenderhead Darter	<i>Percina phoxocephala</i>							1				1
Suckermouth Minnow	<i>Phenacobius mirabilis</i>		1	1					1			
Bluntnose Minnow	<i>Pimephales notatus</i>	31	17	24	16	5		23	1	1	5	8
White Crappie	<i>Pomoxis annularis</i>		24									
Black Crappie	<i>Pomoxis nigromaculatus</i>											
Creek Chub	<i>Semotilus atromaculatus</i>			3								

Total Number of Individuals	241	673	1706	145	157	5	169	550	200	88	110
Total Taxa	11	18	11	7	6	4	12	6	5	12	9
Index of Biotic Integrity (IBI) Score	30	42	32	34	34	32	36	36	36	36	36
Mean IBI Upstream	34.29										
Mean IBI Downstream	36.00										

Table 6. Mean IBI scores for Sangamon River sites upstream and downstream of the main discharge from the Sanitary District of Deatur Treatment Plant

Year	Upstream Reach	Downstream Reach
1998	29	33
2001	32	33
2002	30	34
2003	30	35
2004	30	31
2005	34	34
2006	34	40
2007	31	39
2008	34	36
overall mean	32	35

Sangamon River Discharge at Rte 48 Bridge

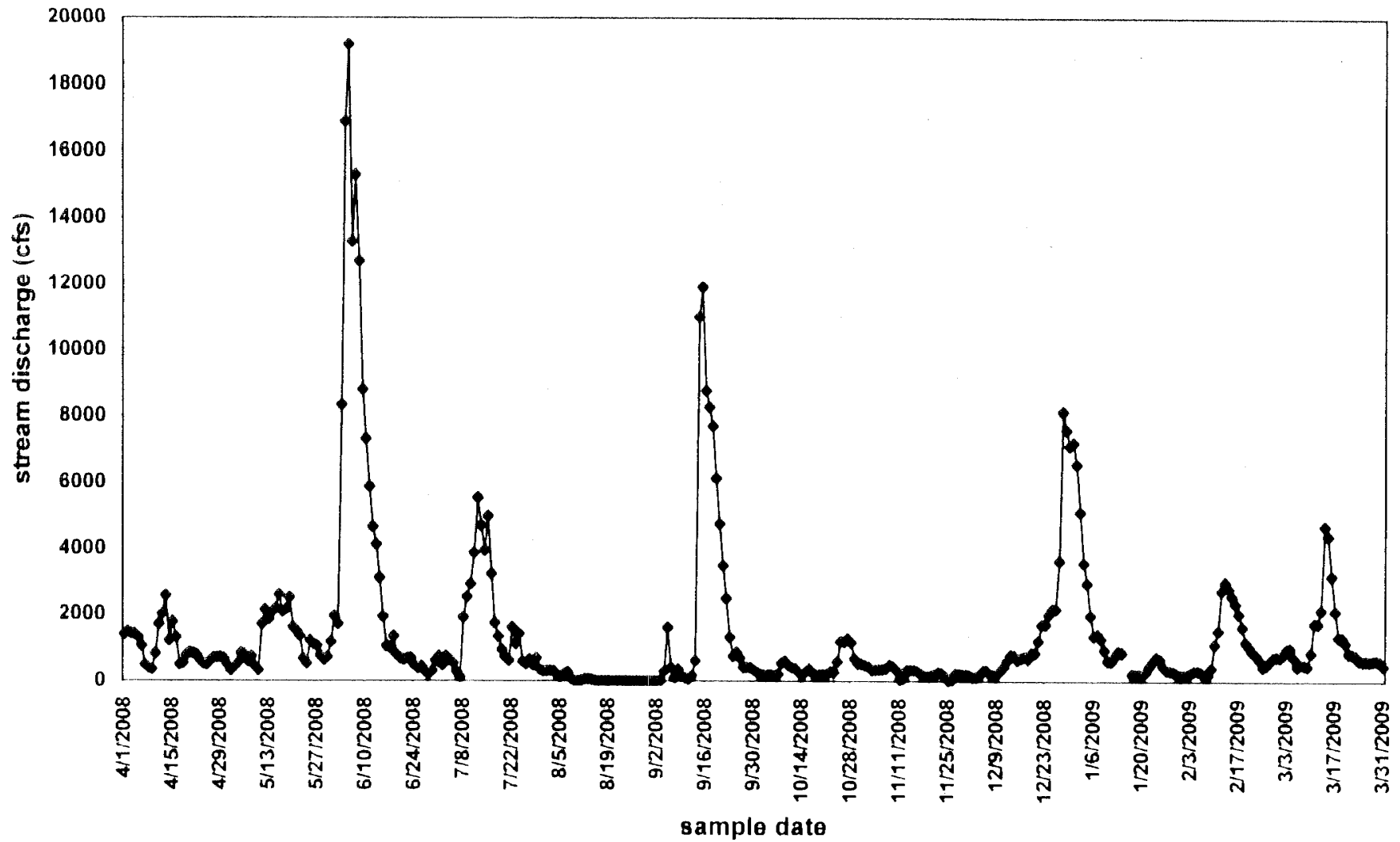


Exhibit 41



Applicant: Sanitary District of Decatur
Contact: Melissa Brown
Address: 501 Dipper Lane
 Decatur, IL 62522

IDNR Project Number: 1804416
Date: 11/29/2017

Project: Amended Petition for Site Specific Rule, PCB No. 14-24 (2017)
Address: 501 Dipper Lane, Decatur

Description: EcoCAT search for informational purposes in support of the Sanitary District of Decatur's Amended Petition for Site Specific Rule filed with the Illinois Pollution Control Board.

Natural Resource Review Results

This project was submitted for information only. It is not a consultation under Part 1075.

The Illinois Natural Heritage Database contains no record of State-listed threatened or endangered species, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves in the vicinity of the project location.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Macon

Township, Range, Section:
 16N, 2E, 17



IL Department of Natural Resources

Contact

Impact Assessment Section
 217-785-5500
 Division of Ecosystems & Environment

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

Terms of Use

By using this website, you acknowledge that you have read and agree to these terms. These terms may be revised by IDNR as necessary. If you continue to use the EcoCAT application after we post changes to these terms, it will mean that you accept such changes. If at any time you do not accept the Terms of Use, you may not continue to use the website.

1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.

3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

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Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

Privacy

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.

Exhibit 42

Table 3: Summary of Technologies Reviewed by ADM Under Variance Granted by Board

	<i>Nickel Capture Method</i>	<i>Concentration of Active Dosage</i>	<i>Nickel reduction</i>	<i>Pilot Status</i>	<i>Nitratox / Respirometer Testing¹</i>	<i>Technically Feasible²</i>	<i>Economically Reasonable³</i>
A - Nickel Proprietary Precipitation Process							
	Activated Clay	1%-3%	40%-60% (0.2 mg/L influent)	Not Piloted	Not tested.	No	N/A
	Acidic Clay	4%-8% wt/wt	40% (0.09 mg/L influent)	Not Piloted	Not tested.	No	N/A
	Chitosan Based	5% wt/wt	90% (0.2 mg/L influent)	Not Piloted	Not tested.	No	N/A
	Proprietary	2% wt/wt	82% (0.1 mg/L influent)	Not Piloted	Not tested.	No	N/A
	Proprietary	200 mg/L	64% (0.12 mg/L influent)	Not Piloted	Not tested.	No	N/A
	Not disclosed	Not disclosed	40-60% (0.2 mg/L influent)	Not Piloted	Not tested.	No	N/A
B - Nickel Chemical Precipitation Process Using Carbamates or Organic Sulfides							
	Polymeric Dimethyl Dithiocarbamate	100 mg/L with 50mg/L of CaCl ₂	30% (0.15 mg/L influent)	Piloted. Total Nickel reduction to 0.06 mg/L.	Passed	No	N/A
	Polymeric Dimethyl Dithiocarbamate	20-50 mg/L	60% (0.15 mg/L influent)	Piloted. Total Nickel reduction to 0.054 mg/L.	Passed	No	N/A

¹ ADM has been working with Riverbend Laboratories in St. Charles, Missouri, to perform respirometer and nitratox testing on various chemistries using MLSS from the District. Such testing is necessary to determine whether the treated effluent is compatible with the District's treatment processes.

² For purposes of this Petition, "Technically Feasible" means ADM's confirmation that the specific technology evaluated will consistently meet: (a) the nickel limit in the District's current NPDES permit; and/or (b) the proposed nickel limit that would apply to ADM based upon the District's current NPDES permit.

³ For purposes of this Petition, "Economically Reasonable" means that the capital and operating costs associated with implementing a specific technology are objectively reasonable. Where ADM determined that a specific technology was not "Technically Feasible," it did not conduct a comprehensive review of whether that technology was also "Economically Reasonable" as indicated by "N/A."

	<i>Nickel Capture Method</i>	<i>Concentration of Active Dosage</i>	<i>Nickel reduction</i>	<i>Pilot Status</i>	<i>Nitratex / Respirometer Testing</i>	<i>Technically Feasible</i>	<i>Economically Reasonable</i>
	Polymeric Dimethyl Dithiocarbamate	100 mg/L	41% (0.15 mg/L influent)	Piloted. Total Nickel reduction to 0.032 mg/L	Passed	Yes ⁴	No
	Dimethyl Dithiocarbamate	50 mg/L + pH 6.0	76% (0.15 mg/L influent)	Piloted. Nickel reduction seen to 0.040 mg/L	Passed	No	N/A
	Polymeric Dimethyl Dithiocarbamate	300 mg/L + pH swing	30% (0.15 mg/L influent)	Not Piloted	Not tested.	No	N/A
	Polymeric Dimethyl Dithiocarbamate	50 mg/L	48% (0.10 mg/L influent)	Piloted. Nickel reduction seen to 0.020 mg/L	Passed	Yes ⁵	No
	Polymeric Dimethyl Dithiocarbamate	200 mg/L	52% (0.15 mg/L influent)	Piloted. Nickel reduction seen to 0.039 mg/L	Passed	No	N/A
	Polymeric Dimethyl Dithiocarbamate	100 mg/L	40% (0.15 mg/L influent)	Not Piloted.	Not tested.	No	N/A
	Dimethyl Dithiocarbamate	100 mg/L	60% (0.15 mg/L influent)	Piloted. Nickel reduction seen to 0.024 mg/L	Passed	No	N/A
C - Reuse of Ion Exchange Resin							
	Sulfonic	0.1-0.5% wt/wt	Complete removal of Ionic Nickel from the Sorbitol plant waste	Installed at Sorbitol Plant	Not required.	Yes	Yes

⁴ Testing on 100 gallon pilot reactor showed total nickel reduction to below 0.037 mg/L. However, reductions were not consistently seen with variation in influent nickel levels.

⁵ Testing on 100 gallon pilot reactor showed total nickel reduction to below 0.037 mg/L. However, reductions were not consistently seen with variation in influent nickel levels.

	<i>Nickel Capture Method</i>	<i>Concentration of Active Dosage</i>	<i>Nickel reduction</i>	<i>Pilot Status</i>	<i>Nitratox / Respirometer Testing</i>	<i>Technically Feasible</i>	<i>Economically Reasonable</i>
D -Nickel and Zinc – Soybean Process Stream Alternative.							
	Evaporation and sale of Soy Molasses	N/A	Complete	In planning stages	Not required	Yes	Yes
E - Nickel and Zinc – BioProducts Process Stream Alternative.							
	Identified as not a significant source of Nickel	N/A	N/A	Not Piloted	Not required	No	N/A
F - Nickel and Zinc – WWTP Sludge Removal System.							
	Centrifuges	N/A	Complete	Not Piloted	Not required	Not determined	No
G - Nickel and Zinc – Reverse Osmosis							
	Phosphate precipitation + Reverse Osmosis	80% recovery of feed	95%+ reduction	Not Piloted	Not tested	No	N/A
	Low pressure Reverse Osmosis	30% recovery of feed	80% + reduction	Not Piloted	Not tested	No	N/A
	Sand Filter	Not disclosed	20% reduction	Not Piloted	Not tested	No	N/A

	<i>Nickel Capture Method</i>	<i>Concentration of Active Dosage</i>	<i>Nickel reduction</i>	<i>Pilot Status</i>	<i>Nitratox / Respirometer Testing</i>	<i>Technically Feasible</i>	<i>Economically Reasonable</i>
H - Nickel and Zinc – Sludge							
	High voltage Pulsating Electric field	N/A	N/A	Not effective	Not tested	No	N/A
I - Nickel and Zinc – Sludge Purchase							
	Sale to fish food company	Not viable	N/A	No customers	Not tested	No	N/A
J - Electro-Chemical Decomposition and Capacitive Deionization							
	Carbon Aerogels	Not tested	Not tested	Not effective	Not tested	No	N/A
	Electrochemical	Not disclosed	Higher Nickel due to leaching from electrode plates	Not Piloted	Not tested	No	N/A
K - Other Approaches							
	Ferric Chloride	100 mg/L	40%	Not Piloted	Not tested	No	N/A
	Protein	not tested	Not tested	Not Piloted	Not tested	No	N/A
	Hydrogen Peroxide and Ozone	5% wt/wt + pH adjustment	20% (0.15 mg/L influent)	Not Piloted	Not tested	No	N/A

	<i>Nickel Capture Method</i>	<i>Concentration of Active Dosage</i>	<i>Nickel reduction</i>	<i>Pilot Status</i>	<i>Nitratox / Respirometer Testing</i>	<i>Technically Feasible</i>	<i>Economically Reasonable</i>
	Protein based	Not disclosed	Not tested	Not Piloted	Not tested	No	N/A
	pH >11.0	1-2% wt/wt	Complete	Being piloted at Polyols Plant for waste stream	Not tested	Yes ⁶	Yes
L- Non-functional Resins							
	Styrene Divinyl Benzene	2-5% wt/wt	20% (0.15 mg/L influent)	Not Piloted	Not tested	No	N/A
	Styrene Divinyl Benzene	4% wt/wt	60% (0.15 mg/L influent)	Not Piloted	Not tested	No	N/A
	Immobilized Ion Exchange Beads	5% wt/wt	Not significant	Not Piloted	Not tested	No	N/A

⁶ Suitable for <~50,000 GPD, non-grain based wastewater with non-chelated, salt-form nickel such as Polyols Plant IX regen waste.

Exhibit 43

Table 4: Technical Challenges on Scale Up for Nickel Remediation Chemistries

	<i>Vendor not cooperative with samples</i>	<i>Assessed and determined not effective</i>	<i>Not commercially available</i>	<i>High Dosages required</i>	<i>Results not scalable beyond bench scale</i>	<i>Low recoveries and brine disposal concerns</i>	<i>Technically Feasible (y/n)</i>	<i>Comments</i>
	X		X				No	
		X		X			No	Would require 5 million pounds of additive per day
			X	X			No	
	X			X			No	
				X			No	Requires a pH to <2 then to pH 5.5 then to pH 10
	X						No	
					X		No	Plant pilot trial did not achieve required Nickel reduction.
		X			X		No	Plant pilot trial did not achieve required Nickel reduction.
					X		No	Plant pilot trial did not achieve required Nickel reduction.
			X				No	
							No	
				X			No	
				X			No	Decolorization resin needs 3,000 cubic feet of resin at \$300/cubic foot. Resin, beds and regeneration equipment estimated at \$8 - 10 million and uses Ethanol to regenerate resin.
		X		X			No	

	<i>Vendor not cooperative with samples</i>	<i>Assessed and determined not effective</i>	<i>Not commercially available</i>	<i>High Dosages required</i>	<i>Results not scalable beyond bench scale</i>	<i>Low recoveries and brine disposal concerns</i>	<i>Technically Feasible (y/n)</i>	<i>Comments</i>
							Yes*	Installed at Sorbitol plant
						X	No	
						X	No	
						X	No	
			X				No	
		X	X				No	
		X					No	Requires over 30,000 pounds of ferric salts per day
			X				No	
		X					No	Raise the pH 10 and add ozone and hydrogen peroxide. Large amounts of chemicals required.
			X				No	
							Yes	Suitable for <~50,000 GPD, non-grain based wastewater with non-chelated, salt-form nickel such as Polyols Plant IX regen waste

* The amount of used ion exchange resin is limited and it is most effective on non-chelated nickel. Therefore, it is being used to capture nickel from the sorbitol process.

Exhibit 44

Sanitary District of Decatur

501 DIPPER LANE • DECATUR, ILLINOIS 62522 • 217/422-6931 • FAX: 217/423-8171

Exhibit 44

November 23, 2016

Luther Pohlmann
Vice President, Corn Production
Archer Daniels Midland Company
PO Box 1470
Decatur, IL 62525

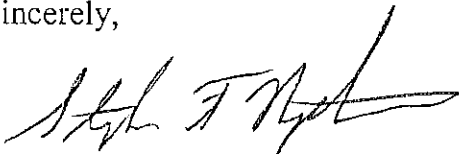
Re: Wastewater Discharge Permit Issue

Dear Mr. Pohlmann:

Enclosed is industrial wastewater discharge permit #200 as issued to ADM. Please review the permit and familiarize yourself with its provisions. This permit is an extension of SDD Ordinance 94-01. The discharges from ADM's facility are regulated by both of the above mentioned vehicles, as well as any state and/or federal regulations as they apply to your industry.

Should you have any questions, please call Charles Jarvis at the number above, extension 246, or me at extension 214.

Sincerely,



Stephen F. Nightingale, P.E.
Compliance Director

Enc.

PC: Brad Crookshank
Ed Anderson
Charles S. Jarvis
Keith Richard
Kent Newton
SDD File

7012 1010 0000 0869 5640
9590 4402 1553 5362 1300 53

SANITARY DISTRICT OF DECATUR, ILLINOIS

501 DIPPER LANE * DECATUR * ILLINOIS * 62522

INDUSTRIAL WASTEWATER DISCHARGE PERMIT APPLICATION

(Type or Print)

RECEIVED

Business Name of Industry Applying for Discharge Permit:

Archer Daniels Midland Company - Permit No. 200 Renewal

SEP 29 2016

Mailing Address: P.O. Box 1470

Decatur, IL 62525

SANITARY DISTRICT
OF DECATUR

Property Address: 4666 Faries Parkway

Decatur, IL 62526

Name of Property Owner: Archer Daniels Midland Company

Tax I.D. or Owner's Social Security Number: 41-0129150

Points of Discharge to the Sewerage System: Points A, B, C and D as listed in Permit No. 200

Type of Industry: Corn and soybean processing refining - "Agri-Processing"

S.I.C. Number(s): Various. See Attachment 1.

Number of Employees: (part-time) _____ (full-time) See Attachment 2.

Hours of Operation (include shift times): Continuous: 24 hours/day, 7 days/week

Products: Various products derived primarily from corn and soybeans. See Attachment 3.

(include a complete description - use additional sheets as needed)

Source(s) of Water and Average Volume From Each Source: See Attachment 4.

City Water Account Numbers: See Attachment 8.

Wastewater Producing Operations (in order of significance): See Attachment 4.

Water Consumption; Average Daily (gal/day): Attach 4 Maximum Daily (gal/day): Attach 4

Wastewater Discharge; Average Daily (gal/day): Attach 4 Maximum Daily (gal/day): Attach 4

Production &/or Cleanup: 7 days/week 24 hours/day

Mark days on which there will be a discharge: Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☒ Sat ☒ Sun ☒

List Categorical Processes: 40 CFR 406 Subpt A Corn Wet Milling; 40 CFR 439.20 Subpt B Pharm Mfg Extraction

(Those processes defined in 40 CFR, Parts 403 - 471 as categorical)

SANITARY DISTRICT OF DECATUR, ILLINOIS

501 DIPPER LANE * DECATUR * ILLINOIS * 62522

List the Types and Descriptions of Major Processes: See Attachment 3.

Attachment 5 contains information concerning current water permits. Additional permits for other media (& SPCC plans on file) are available upon request.

Is the First Major Process: (check one)



Continuous/intermittent Discharge



Batch Discharge



Dry (no discharge)

Attach a current laboratory analysis report that accurately details the constituents of the industrial wastewater discharges from your entire facility, and a list of all current environmental permits issued for air, land, or water. Also include a supplemental information form for each individual process (including the one listed on this form).

Describe Method(s) of Wastewater Pretreatment at Your Facility: _____

Anaerobic reactors, aerobic reactors, denitrification, dissolved air flotationHours of Pretreatment Operation: Continuous: 24 hours/day, 7 days/weekName of IEPA Certified Operator: See Attachment 7.

Company Representative Responsible for the Industrial Wastewater Discharges From This Industry:

Name: Brad CrookshankTitle: Waste Water Treatment SuperintendentTelephone Number: 217-451-4534E-Mail Address: brad.crookshank@adm.com

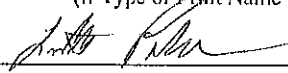
Signature for Application (Company Administrative Official): I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the Person or Persons who manage the system, or those Persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Luther Pohlmann

(Type or Print Name)

Position: Vice President Corn Operations

(Type or Print Position)

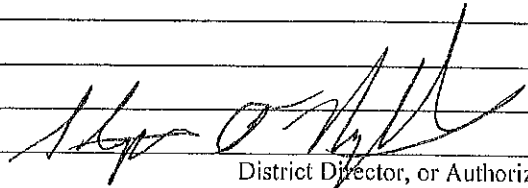
Signature: Date of Application: 9/20/16

In consideration of the granting of this permit, the applicant agrees to the conditions on page three.

Application: ☒ Approved if AcceptedSDD Permit Number: 200Effective Date: 11/16/2016Expiration Date: 11/15/2021

Denied

Reasons _____

By: 

District Director, or Authorized Agent of the Sanitary District of Decatur.

SANITARY DISTRICT OF DECATUR, ILLINOIS

501 DIPPER LANE * DECATUR * ILLINOIS * 62522

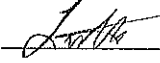
IN CONSIDERATION OF THE GRANTING OF THIS PERMIT, THE APPLICANT AGREES:

1. To furnish any additional information on industrial wastewater discharges as required by the Sanitary District of Decatur.
2. To operate and maintain any required industrial wastewater treatment devices in a satisfactory and approved manner.
3. To cooperate at all times with the Sanitary District of Decatur's personnel, or their representatives, in the inspection, sampling and study of industrial wastewater facilities and discharges.
4. To notify the Sanitary District of Decatur in the event of any accident, negligence or other occurrence that causes the discharge to the sewer of any materials whose nature and quantity might constitute a hazard to the District's personnel, wastewater treatment facilities or the environment.
5. To submit, as required by the Sanitary District of Decatur, accurate data on industrial wastewater discharge flows and wastewater constituents.
6. To apply for a revised District's industrial wastewater discharge permit if any change in industrial processes or operations creates a significant change in industrial wastewater quality or quantity.
7. To provide immediate access to authorized personnel of the Sanitary District of Decatur to any facility directly or indirectly connected to the District's sewerage system under emergency conditions and at all other reasonable times.
8. To accept and abide by all provisions of Ordinances of the Sanitary District of Decatur.
9. To submit additional pages as required to furnish any and all information if adequate room is not provided on the approved form.

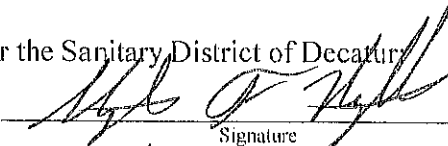
Acceptance and Acknowledgment

The undersigned hereby warrants that the undersigned Luther Pohlmann is the facility's administrative official and is authorized to execute this permit on behalf of the IU hereby agreeing and acknowledging that the IU is bound and obligated to fulfill the terms and conditions of their permit. The SDD may enforce this permit in accordance with the provisions of Ordinance 94-01 as amended and as necessary in the Circuit Court of Macon County, Illinois.

For industrial user Archer Daniels Midland Company:

 _____ Signature	<u>7/20/16</u> _____ Date
<u>Luther Pohlmann</u> _____ Printed Name	<u>Vice President Corn Operations</u> _____ Title

For the Sanitary District of Decatur:

 _____ Signature	<u>7/22/16</u> _____ Date
<u>Stephen F. Nightingale</u> _____ Printed Name	<u>Compliance Director</u> _____ Title

INDUSTRIAL DISCHARGE PERMIT

PERMIT NUMBER: 200

Date issued: November 16, 2016
Expiration Date: November 15, 2021

Industrial User (IU): Archer Daniels Midland Company (ADM)

Administrative Official: Luther Pohlmann
Title: Vice President, Corn Operations
Telephone Number: (217) 424-5200

Authorized Representatives: Troy Lancaster
Title: CoGen Plant Manager
Telephone Number: (217) 454-2569

Designated Contact Person: Brad Crookshank
Title of Contact Person: Waste Water Treatment Superintendant
Telephone Number: (217) 451-4534
E-Mail Address: brad.crookshank@adm.com

Discharge Location(s): "A" - Corn Sweeteners Pumping Station (ADM East, CSI)
"B" - Faries Park Pumping Station (Faries)
"C" - West Plant Discharge (Division Street)
"D" - North Pump Station (To the Damon Avenue Pump Station)

Site Address: 4666 Faries Parkway
Decatur, Illinois 62526

Mailing Address: Box 1470
Decatur, IL 62525

SIC Code(s): 2038, 2046, 2048, 2075, 2079, 2099, 2833, 2869, 4213, & 4911

Industry Type: Corn and Soybean Processing and Refining - "Agri-Processing"

Categorical Citation: 40 CFR 406, Subpart A, Corn Wet Milling Subcategory, existing source
(with no categorical pretreatment standards)
40 CFR 439.20, Subpart B, Pharmaceutical Manufacturing, Extraction
Subcategory, new source

The above named **Industrial User (IU)** is required to comply with the conditions stated on the permit application form and all conditions, special and standard, as presented in this approved discharge permit. Satisfactory evidence of compliance with these conditions shall be supplied to the **Sanitary District of Decatur (SDD)** where requested. Satisfactory evidence shall consist of a minimum of written notification signed by an Authorized Representative of the IU and the submission of additional drawings and data when expressly requested.

A. SPECIFIC WASTEWATER DISCHARGE LIMITS AND SAMPLE FREQUENCY

1. Sanitary District of Decatur Monitoring Requirements and IU Discharge Limits.

This part contains the IU's discharge limits. The IU shall maintain compliance with these limits. These are the parameters that will normally be monitored by the SDD at the designated discharge points as described in Section C of this permit. The total discharge flow limit and the mass limits for BOD₅, TSS, nickel, and NH₃-N apply to the combination of all plant discharges. The pH limit and all concentration limits apply to each individual discharge point. Grab sample limits apply to each individual grab sample and to entries on pH monitoring charts. Under "Monitoring Frequency," "2X/Year" means samples shall be collected approximately every six months (semiannually) and "4X/Year" means samples shall be collected quarterly. A "24-hr AC" is a daily composite sample collected over a 24-hour period.

Parameter	Daily Maximum	Monthly Average	Monitoring Frequency	Monitoring Method	Monitoring Locations
Discharge Flow					Points:
Total (MGD)	16.00	14.00	Continuous	Record and	A, B, C, & D
Points A, B, & C (MGD)	11.00	N/A	Continuous	Totalize At	A, B, & C
Point B (MGD)	1.00	N/A	Continuous	Each Point	B
Point C (MGD)	1.00	N/A	Continuous		C
Biochemical Oxygen Demand (BOD ₅) (lb.)	40,032	35,028	Daily****	24-hr AC	Points: A, C, & D
Total Suspended Solids (TSS) (lb.)	46,704	40,866	Daily****	24-hr AC	Points: A, C, & D
pH (minimum to maximum range in units)*	6.00 to 11.00*	N/A	4X/Year (minimum)	Grab	Points: A, C, & D
Ammonia Nitrogen (NH ₃ -N) (lb.)	4,003	3,503	Weekly (minimum)	24-hr AC	Points: A, C, & D
Fats, Oils & Grease – Total (FOG-T) (mg/L)	100	N/A	4X/Year** (minimum)	Grab	Points: A, C, & D
Arsenic (As) (mg/L)	1.2	N/A	N/R ¥	24-hr AC	N/A
Boron (B) (mg/L)	9.0	N/A	N/R ¥	24-hr AC	N/A
Cadmium (Cd) (mg/L)	3.6	N/A	N/R ¥	24-hr AC	N/A
Chromium (Cr) (mg/L)	14.5	N/A	N/R ¥	24-hr AC	N/A
Iron (Fe) (mg/L)	87.0	N/A	N/R ¥	24-hr AC	N/A
Copper (Cu) (mg/L)	3.0	N/A	N/R ¥	24-hr AC	N/A
Lead (Pb) (mg/L)	2.3	N/A	N/R ¥	24-hr AC	N/A
Nickel (Ni) (lb.)	22.226	7.231	At least 48x/Year***	24-hr AC	Points: A & D
Silver (Ag) (mg/L)	1.0	N/A	N/R ¥	24-hr AC	N/A
Zinc (Zn) (mg/L)	1.70	0.450	4X/Year	24-hr AC	N/A
Cyanide (CN ⁻) (mg/L)	2	N/A	N/R ¥	Grab	N/A
Phenols (mg/L)	0.57	N/A	N/R ¥	Grab	N/A
Acetone (mg/L)	20.7	8.2	2X/Year	Grab	A & D
n-Amyl acetate (mg/L)	20.7	8.2	N/R †	Grab	A & D
Ethyl acetate (mg/L)	20.7	8.2	2X/Year	Grab	A & D
Isopropyl acetate (mg/L)	20.7	8.2	N/R †	Grab	A & D
Methylene Chloride (mg/L)	3.0	0.7	N/R †	Grab	A & D

INDUSTRIAL DISTRICT OF DECATUR
Industrial Waste Division

- * pH readings on the recording pH meters between 5.0 and 6.0 or between 11.0 and 12.0 for less than a total of forty five (45) minutes in any calendar day shall not be considered reportable violations of this permit as per SDD Ordinance Number 11-10.
- ** Additional FOG-T monitoring may be done if the SDD sees a significant increase in FOG in the system.
- *** We shall monitor the nickel concentration in the effluent approximately four times per discharge point each month unless we see a violation of the nickel limit shown here or other just cause for increased sampling exists in which case nickel monitoring frequency would exceed 48 times per year.
- **** The BOD and TSS limits in this permit are tied to the permit of the ADM Railcar Repair and JRRRC Research facilities. As long as ADM does not exceed their BOD permit limit or the combination of the waste from ADM, ADM Railcar Repair, and JRRRC does not exceed the ADM BOD limit by more than 230 pounds, ADM will be considered to be in compliance with their BOD limit. As long as ADM does not exceed their TSS permit limit or the combination of the waste from ADM, ADM Railcar Repair, and JRRRC does not exceed the ADM TSS limit by more than 252 pounds, ADM will be considered to be in compliance with their TSS limit.
- ¥ N/R means not required. This SIU has determined that these pollutants are not present or generated at this facility at levels that approach the local limit for the parameters so SDD has granted the IU a waiver from routine monitoring for these pollutants. SDD will periodically monitor for these parameters and the IU is responsible for the cost of the additional monitoring. The IU shall maintain records showing their determination that these pollutants are not present in their discharge.
- † This SIU has determined that these pollutants are not present or generated at this facility so SDD has determined that routine monitoring for these pollutants by SDD is not necessary. The IU is to monitor for these parameters annually and report any detection to the SDD immediately. Results that were below detection limits must be maintained on file for periodic review by the SDD. The IU shall maintain records showing their determination that these pollutants are not present in their discharge.

2. Industrial User Monitoring Requirements.

These are the IU's self-monitoring requirements. All monitoring results must comply with the limits stated in part 1 above.

Parameter	(units)	Monitoring Frequency	Monitoring Method	Monitoring Locations
Discharge Flow	(GPD)	Daily	Record and Totalize	A, B, C, & D
BOD ₅ and TSS	(mg/L)	Waived	24 Hour Composite	A, C, & D
pH	(units)	Continuous	Record	A, C, & D
FOG-T	(mg/L)	Waived	Grab	A, C, & D
NH ₃ -N	(mg/L)	Waived	24 Hour Composite	A, C, & D
Ni & Zn	(mg/L)	Waived	24 Hour Composite	A & D
Acetone	(mg/L)	2X/Year	Grab	A & D
n-Amyl acetate	(mg/L)	Annually (d)	Grab	A & D
Ethyl acetate	(mg/L)	2X/Year	Grab	A & D
Isopropyl acetate	(mg/L)	Annually (d)	Grab	A & D
Methylene chloride	(mg/L)	Annually (d)	Grab	A & D

- a. The SDD may waive all or part of the self-monitoring requirements.
- b. Additional sampling may be done by the SDD if any discharge limit is exceeded and the permittee will be responsible for the costs of the additional monitoring.

- c. When the IU's self-monitoring indicates an excursion from their permit limits, the IU shall notify the SDD immediately and shall resample for the parameter that exceeded their limit, analyze the sample, and report the results to the SDD within 30 days of the original sampling.
- d. SIU results of acetone and ethyl acetate analyses shall be submitted semiannually, whereas results for the n-amyl-acetate, isopropyl acetate, and methylene chloride analyses only need to be reported if they are detected above the method detection limit. All results must be kept on file and made available to representatives of the SDD, IEPA, and USEPA upon request. If any of these three parameters shows up above detection limits, the SIU monitoring and reporting frequency for the pollutant that was detected will immediately be increased to semiannually (two times per year at equal intervals), and the SDD will also monitor for that parameter semiannually. The SIU shall keep on file available for review by SDD, IEPA, or USEPA all documentation used to determine that n-amyl acetate, isopropyl acetate, and methylene chloride are neither used nor generated at this facility.

B. DEFINITION OF PENALTY CONDITIONS

1. When any violation of a specific or general prohibition occurs, a penalty of \$1,000.00 per day per violation will result as a condition of this permit by authority of the SDD Board of Trustees. Each analytical parameter or reporting requirement related to this permit is considered distinct and penalties may be assessed individually with a maximum daily penalty equaling \$1,000.00 multiplied by the distinct number of violations per day.
2. A violation of an Order of the SDD Board of Trustees shall be deemed a distinct violation and each day the violation persists shall be considered a new and distinct violation subject to a board assigned penalty of \$1,000.00.
3. In addition to the penalties provided herein, the SDD may recover reasonable attorney's fees, court costs, court reporter fees, and other expenses of litigation by appropriate suit at law against the person found to have violated Ordinance 94-01, as amended, or the orders, rules, regulations and conditions of this permit.

C. MONITORING REQUIREMENTS

1. Description of Outfalls/Sample Points

- a. Point "A" will be the existing Corn Sweeteners Pumping Station sample point directly south of the sweetener plant in the East Plant complex – this is the point known as "CSF".
- b. Point "B" will be the existing Faries Park Pumping Station sample point.
- c. Point "C" will be the existing West Plant sample station, which is centrally located in the West Plant complex.
- d. Point "D" will be the effluent from the north Corn Sweeteners pumping station, which is located at the north side of the East Complex. This is the "Damon" discharge point.

Note: The effluent from ADM's truck wash facility on North Brush College Road is piped over to the east complex for pretreatment and discharge to the SDD.

2. General Monitoring Requirements

- a. The wastewater discharged by this facility shall be monitored as detailed in Section A of this permit. For the purpose of surcharge and compliance, the concentration of pollutants at Point "B" shall be assumed identical to the concentration of pollutants at Point "A", therefore no

sampling is normally necessary at Point "B". Samples shall be collected and submitted for point C only if process flow or contaminated rainwater is discharged or if the total flow for the day exceeds 25,000 gallons in a day (or both). All samples shall be collected so as to be representative of the IU's daily wastewater discharges, and a minimum of one-half gallon of all samples is to be submitted to the SDD daily.

- b. The IU is responsible for cleaning and maintaining the sample points to prevent any accumulation of oil, grease, sediment, or sludge; failure to do so does not invalidate the sampling and/or analytical test results. Results of analyses of samples taken at the designated locations according to approved sampling procedures shall be accepted as binding.
- c. All samples obtained either by the IU or the SDD for the purpose of verifying compliance with Permit or Ordinance conditions shall be collected, preserved, and analyzed in accordance with the procedures approved under 40 CFR part 136 as amended.

3. Monitoring Equipment

The IU will utilize and maintain:

- 1) automatic flow proportioned sampling devices that facilitate collection of samples that comply with the sampling and preservation criteria set in 40 CFR Part 136 as amended at discharge points A, C, & D;
- 2) flow measuring and recording devices that accurately measure the volume of all wastewater discharges and are capable of sending signals to automatically collect flow proportioned samples at each discharge point; and
- 3) recording pH meters to continuously measure and record pH at discharge points A, C, and D. These pH meters shall be standardized at least once per day with a standard log kept for all meter calibrations and standardizations.

4. Sample collection and analysis

- a. At least one-half gallon of the daily composite sample from each discharge point A, C (when required), & D will be turned over to SDD personnel each morning. All samples should be ready for pick up by the SDD at the West Plant guardhouse no later than 6:00 a.m. each day. All samples shall be maintained at or below 40° F, but not frozen. Weekend samples will normally be collected by the SDD on Monday.
- b. The IU will reimburse the SDD for all sample collection and analytical services according to the SDD's schedule of fees and services or according to actual costs for samples sent out.

D. REPORTING REQUIREMENTS

- 1. All reports required by this permit or by the SDD Pretreatment Ordinance shall be signed by the IU's administrative official or the authorized representative. An authorized representative must be authorized in writing as per Ordinance 94-01, as amended.
- 2. The IU shall give a thirty (30) day advance written notice to the SDD, and simultaneously shall apply to the SDD for a new permit, prior to introducing any new wastewater constituents to the sewer system or to making any substantial change beyond normal seasonal variations in the existing operations or facilities that would affect the volume or character of the wastewater being introduced to the sewerage system.
- 3. The IU shall notify the SDD immediately (*within one-half hour after first noticing the discharge*) in the event of an accidental or slug discharge to the sewerage system as outlined in Section

300.135, III of Ordinance No. 94-01, as amended. Within five (5) days following an incident, the IU shall submit to the SDD a detailed written report describing the cause of the discharge and the measures to be taken by the IU to prevent similar future occurrences.

4. The IU shall submit a report to the SDD a minimum of ninety (90) days prior to any substantial change in sludge disposal practices.
5. Any upset or excursion experienced by the IU of its pretreatment that places it in a temporary state of non-compliance with wastewater discharge limitations shall be reported to the SDD as soon as possible (not to exceed 24 hours from first awareness of the upset or excursion). A detailed report shall be submitted to the SDD within five (5) days of the upset or excursion. The report shall include the following:
 - a. A description of the cause of noncompliance;
 - b. The duration of non-compliance, including exact dates and times or, if not already corrected, the anticipated time the noncompliance is expected to cease; and
 - c. Steps being taken and/or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

Failure to make a proper report of an upset or a slug load shall be deemed a distinct violation of this permit.

6. The IU shall submit an Annual Report to the SDD by March 1 each year on the report form provided by the SDD. The report is to include details of changes that have been made during the previous calendar year that could cause pass through or interference at the SDD treatment facility and/or in the collection system, or could be detrimental to the SDD's Land Application of Sludge program.
7. It is the responsibility of the IU to immediately (*within one-half hour after first noticing the discharge*) report to the SDD any materials discharged that may pass-through or interfere with the POTW.
8. The IU will deliver flow data as required by the SDD along with the daily samples.
9. The IU will provide the calibration records from the pH and flow-metering equipment as requested by the SDD.
10. The IU shall report the results of all approved self-monitoring at least twice per year. Self-monitoring shall be done at approximately the same time each year. These self-monitoring reports shall be due on or before June 1 and December 1 of each year of this permit.

E. SPECIAL CONDITIONS

1. Volumetric Assignments

The total volumetric discharge limit of 16,000 MGD shall be divided as follows:

- a. The volumetric peak rate of discharge to the District's East Side Booster Pump Station through ADM's private force main (the combination of Points A, B, and C) shall be such that the total of the three permitted discharges does not exceed 11,000,000 gallons per day. [7,639 gallons per minute (gpm)]
- b. The volumetric peak rate of discharge to the Fairies Park Pump Station (point B) shall not exceed 1,000,000 gallons per day. (695 gpm)

- c. The volumetric peak rate of discharge to the District's 18-inch intercepting sewer located at 34th and Division Streets (ADM's West Plant discharge, Point C) shall not exceed 1,000,000 gallons per day. (695 gpm)

2. Minimum Volumetric Discharge

ADM will discharge wastewater to the SDD at such a rate to ensure a minimum monthly average discharge of 5.6 MGD. Discharge volumes of less than 5.6 MGD will not be considered a violation of this permit but will result in the calculation of monthly use charges based on 5.6 MGD.

3. Pretreatment System Operation

The IU shall have its pretreatment system under the control and direction of an Illinois Environmental Protection Agency certified operator at all times as per Ordinance 94-01, Section 300.125 Pretreatment. Any change in the pretreatment facilities or significant change in the method of operation shall be submitted to and approved by the POTW prior to the Industrial User's initiation of the changes.

4. Truck Wash Log Sheets

The IU shall keep a constant running log of every tank and truck washed at the truck wash facility. A separate entry shall be made for each tank or truck washed. The record shall include:

- a. the date and time of washing,
- b. the truck identification (ID) number, and the truck company,
- c. the last product hauled and the source,
- d. the amount of heel remaining,
- e. the driver's name or signature, and
- f. the truck wash attendant's name.

These wash logs shall be made available to representatives of the SDD at all reasonable times.

5. Truck Wash Restriction

This permit authorizes the truck wash facility to discharge wastewater only from the washing of trucks and/or trailers that have last hauled food products, as defined in 40 CFR part 442. At no time shall the IU wash any tank that contained any material that is considered a hazardous waste. Any infraction of this condition may be grounds for permit revocation.

6. Daily Submittal of pH and Flow Charts

The IU shall submit daily charts from the pH and flow recorders at discharge points A and D to the SDD each day along with the daily samples.

7. New Nickel Limits

This permit may be modified by SDD to replace the nickel limits with different limits for nickel. Events that may result in a permit modification include but are not limited to exceedences of SDD's total nickel NPDES Permit limit, or issuance of a renewed NPDES permit to SDD containing a total nickel limit different from the current limit of 0.015 mg/L. A compliance schedule for ADM achieving more restrictive limits than those shown in Table 1 will be considered to the extent such a schedule is consistent with SDD's Pretreatment Ordinance and with any compliance or enforcement action to which SDD may become subject.

Evaluations of compliance with the limits in Section A part 1 shall include consideration of all sample analyses performed by or on behalf of ADM and SDD, provided sampling and analysis procedures are done in accordance with 40 CFR Part 136.3 and acceptable to SDD.

In addition to meeting applicable nickel limits, ADM shall:

- a. Analyze the daily samples from Point A and Point D for total nickel seven days a week and submit the results of the analyses to the SDD by the twentieth day of the following month.
- b. Continue operation of the ion exchange treatment system at the Sorbitol Plant to remove soluble nickel from wastewater. Continue to collect spent, spilled, and particulate catalyst for recycling or disposal outside the sewers.
- c. Continue to manage the soy molasses stream from the East Soybean Processing Plant in a way that keeps it from entering the SDD wastewater collection system.
- d. Continue operation of the nickel precipitation process at the Polyols Plant as long as the Polyols Plant is in operation.
- e. Obtain authorization from SDD prior to intentional wasting of solids to the SDD wastewater collection system, from ADM's anaerobic or aerobic wastewater treatment processes. Intentional wasting does not include typical solids discharged due to carryover from the final clarifiers or DAF that are compliant with other conditions of this permit and are representative of average amounts discharged over the preceding year.

8. Dissolved Metals

The IU shall not introduce any significant sources of nickel (such as but not limited to a catalyst for a new process), nor shall it change any process such that it would significantly change the ratio of total nickel to dissolved nickel in its final discharge to the sewer system, without prior written notification to and approval from the SDD.

F. STANDARD CONDITIONS

1. Permit Duration and Re-application

This wastewater discharge permit is being issued for a period of five (5) years. The IU shall file an application for renewal of their permit at least ninety (90) days prior to the expiration date.

2. Limitation on Permit Transfer

This permit is issued for the specific process activity outlined in the permit application and permit and shall not be assigned, transferred, or sold to a new owner or new IU in the same or different premises or to a new or changed operation in the same or different premises without the written approval of the SDD. The permitted industry must give a copy of the existing discharge permit to the new owner upon the sale or transfer of ownership of this business.

3. Modifications or Revisions of this Permit

- a. The terms and conditions of this permit may be subject to modifications by the SDD during the term of this permit as limitations or requirements in Part 300 of Ordinance 94-01, as amended are modified or other just cause exists.
- b. The terms and conditions of this permit may be modified as a result of the EPA promulgating new Categorical Discharge Standards or other applicable standards or regulations.
- c. The terms and conditions may be modified in the event that the type, quality, or volume of the IU's wastewater is expected to change substantially from when this permit was granted.

- d. The SDD shall inform the IU of any proposed changes in its permit at least thirty (30) days prior to the effective date of change.
- e. If it becomes necessary for the SDD to modify the IU's permit, a reasonable time schedule shall be given to achieve compliance.

4. Semiannual Self-monitoring and Additional Monitoring

- a. The IU shall monitor its wastewater discharges twice per calendar year at six-month intervals. This self-monitoring shall be performed and the results shall be reported to the SDD according to the schedule and on the proper form as provided by the SDD.
- b. Periodically, the SDD will monitor the IU's wastewater discharges for pollutants other than those limited by this permit. The IU will reimburse the SDD for all costs incurred in this additional monitoring.

5. Confidentiality

Matters of confidentiality shall be handled in accordance with Section 400.140 of Ordinance 94-01, as amended.

6. Reporting and Inquiries

All reports and inquiries should be sent to: Attn: Pretreatment Coordinator
Sanitary District of Decatur
501 Dipper Lane
Decatur, IL 62522

7. Monitoring Records

Records for monitoring information shall include:

- a. the sample dates, exact sample locations, sampling methods, types of samples, time of sampling, and the name of the person or persons taking the sample(s);
- b. the dates analyses were performed;
- c. the name of the laboratory that performed the analyses;
- d. the analytical techniques/methods used; and,
- e. the results of such analyses expressed in units as given in Section A, part 1, of this permit.

8. Records Retention

- a. The IU shall retain and preserve for no less than three (3) years any records, books, documents, or reports relating to monitoring, sampling, and/or analyses made by or on behalf of the IU in connection with its discharge.
- b. All records that pertain to matters that are the subject of special orders or any other enforcement or litigation activities brought by the SDD shall be retained and preserved by the IU until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

9. Signatory Requirements

All applications, reports, or information submitted to the SDD as required by this permit shall be signed by the authorized representative of the IU in the following positions:

- a. Corporation - principal executive officer of at least the level of a vice president.

- b. Partnership or Sole Proprietorship - general partner or proprietor.
- c. Duly authorized representatives of corporation, partnership, or sole proprietorship, if such representative is responsible for the overall operation of the facility from which the indirect discharge originates.

10. Bypass

All industrial users are prohibited from unpermitted bypasses of their pretreatment system. Permission for a bypass of the pretreatment system must be obtained from the SDD. Failure to obtain permission for a bypass of the pretreatment system shall be deemed to be a violation of this Ordinance.

11. Inspection

The SDD shall conduct at least two complete facility inspections per year, one scheduled, and one drop-in.

12. Access

The IU will allow authorized representatives of the SDD, the United States Environmental Protection Agency (USEPA), or the Illinois Environmental Protection Agency (IEPA) immediate access at all reasonable times to the sampling points, areas of the plant where a discharge to the sewers may occur, and areas of the plant where records of concern to the SDD are kept. SDD personnel will present proper identification when requested by IU representatives.

13. Authorized Personnel

SDD personnel who are approved by the SDD Director, USEPA personnel, and IEPA personnel are authorized to carry out inspections and/or monitoring activities.

14. Falsification

Any person knowingly making any false statements on any reports or any other documents required by this permit, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall be subject to the penalties and costs provided for in this permit or in Section 600.100 of Ordinance 94-01, as amended; and shall in addition be guilty of a misdemeanor and, upon conviction, be punished by a fine of not more than one thousand dollars (\$1,000.00) for each incident.

15. Payment: User Charges and Surcharges

- a. The IU shall pay for normal costs of wastewater treatment through the user charge/surcharge system, as approved by the United States Environmental Protection Agency, or other relief authorized by the SDD's Ordinance or applicable laws.
- b. The IU shall pay to the SDD, all costs incurred by the SDD in sampling and analyzing the IU's wastewater discharges.
- c. Administrative penalties are not a normal cost of wastewater treatment.

16. Injunctive Relief and Other Enforcement Procedures

The SDD may institute a civil action for an injunction to restrain violations of the terms of this permit in accordance with the procedures set forth in Section 500.130 of Ordinance 94-01, as amended, and pursue such other enforcement procedures as may be provided by the SDD Ordinance including collection of penalties or costs as per section 600.100 or revocation of the

Permit for repeated or flagrant violations as per section 500.115 of Ordinance 94-01. If the SDD institutes a civil action to enforce the terms of this permit, the IU shall be responsible for all costs incurred by the SDD to enforce the terms and conditions of the permit, including but not limited to its attorney fees.

17. Severability

The conditions of this permit are severable, and if any provision(s) of this permit, or application of any provision of this permit is held invalid, the remaining provisions of this Permit shall continue in full force and effect.

18. General Prohibitions

Issuance of this permit is not a substitute for, nor does it relieve the IU from the authority of any applicable local, state, or federal industrial pretreatment regulation.