Saline River Watershed

Nutrient Assessment Reduction Plan

City of Harrisburg

Greater Egypt RPDC

Contents

Executive Summary

The Saline River Watershed Nutrient Assessment Reduction Plan (NARP) was developed by the City of Harrisburg in partnership with the Greater Egypt Regional Planning and Development Commission to meet Illinois EPA requirements for addressing eutrophication risks in phosphorus-sensitive watersheds. The plan responds to statewide nutrient-reduction goals. The municipality discharges to the Middle Fork Saline River and is the only municipality required to complete the NARP in the Saline River watershed.

The planning process included two years of watershed sampling, data review, and stakeholder coordination. A comprehensive sampling plan was implemented for 2025, establishing upstream, outfall, and downstream monitoring locations at the wastewater facility and collecting key water-quality parameters such as phosphorus, chlorophyll-a, dissolved oxygen, and pH. Modeling using EPA's Pollutant Load Estimation Tool (PLET) confirmed that nonpoint agricultural sources remain the dominant contributors of phosphorus throughout the Saline River watershed, though municipal point sources represent localized loads in some subwatersheds.

The NARP sets forth a coordinated watershed strategy emphasizing both point- and nonpoint-source solutions. For municipal discharges, recommended actions include biological nutrient removal, chemical phosphorus treatment, high-rate filtration, operational optimization, and sludge-handling improvements. For nonpoint sources, the plan promotes agricultural best management practices such as cover crops, conservation tillage, filter strips, grassed waterways, drainage water management, critical-area plantings, and livestock exclusion. These measures target high load subwatersheds identified in the PLET modeling.

The NARP also outlines available technical and financial assistance programs, including USDA conservation programs, Illinois EPA loan and grant resources, and potential watershed partnerships. An implementation schedule and monitoring plan describe how communities will track progress, evaluate effectiveness, and remain compliant with IEPA requirements. While challenges remain, including limited funding for planning, the large size of the watershed, and the difficulty of engaging nonpoint partners, the plan provides a practical blueprint for meeting nutrient-reduction goals and improving water quality within the Saline River watershed.

1. Nutrient Assessment Reduction Planning (NARP)

1.1 NARP Background and Requirements

In 2020, the Illinois Environmental Protection Agency (IEPA), through the National Pollutant Discharge Elimination System Permits (NPDES), began enforcing the development of Nutrient Assessment Reduction Plans (NARP) for municipal facilities that discharge into waterbodies that are impaired by or at risk of eutrophication. Due to the cities' small populations and economic disadvantages, they do not have adequate staff or sufficient budget to create this plan internally.

A waterbody or stream segment is at risk for eutrophication if it meets one of the following criteria:

1. *Its **pH exceeds 9.0**, the upper limit of the water quality standard;*
2. *Its **median sestonic chlorophyll a is greater than 26 mg/L;** or*
3. *Its **pH exceeds 8.35** and its **dissolved oxygen is greater than 110% on the same day, for two or more days from** Illinois EPA sampling.*

The IEPA defines the purpose of the NARP as: "to identify phosphorus input reductions and other measures that can be implemented by a major municipal facility or group of major municipal facilities via a watershed workgroup to help ensure that dissolved oxygen and offensive aquatic algae and aquatic plant criteria are met throughout a watershed."
The IEPA lists eight requirements of a NARP:

> *A. The NARP shall be developed and submitted to the Agency by December 31, 2025. This requirement can be accomplished by the Permittee, by participating in an existing watershed group or by creating a new group. The NARP shall be supported by data and sound scientific rationale.*

B. The Permittee shall cooperate with and work with other stakeholders in the watershed to determine the most cost-effective means to address the risk of eutrophication. If other stakeholders in the watershed will not cooperate in developing the NARP, the Permittee shall develop its own NARP for submittal to the Agency to comply with this condition.

C. In determining the target levels of various parameters necessary to address the risk of eutrophication, the NARP shall either utilize the recommendations by the Nutrient Science Advisory Committee or develop its own watershed-specific target levels.

D. The NARP shall identify phosphorus input reductions from point sources and non-point sources in addition to other measures necessary to remove the risk of eutrophication characteristics that will cause or may cause violation of a water quality standard. The NARP may determine, based on an assessment of relevant data, that the watershed does not have a risk of eutrophication related to phosphorus, in which case phosphorus input reductions or other measures would not be necessary. Alternatively, the NARP could determine that phosphorus input reductions from point sources are not necessary, or that phosphorus input reductions from both point and nonpoint sources are necessary, or that phosphorus input reductions are not necessary and that other measures, besides phosphorus input reductions, are necessary.

E. The NARP shall include a schedule for the implementation of the phosphorus input reductions and other measures. The NARP schedule shall be implemented as soon as possible and shall identify specific timelines applicable to the permittee.

F. The NARP can include provisions for water quality trading to address the phosphorus related risk of eutrophication characteristics in the watershed. Phosphorus/Nutrient trading cannot result in violations of water quality standards or applicable antidegradation requirements.

G. The Permittee shall request modification of the permit within 90 days after the NARP has been completed to include necessary phosphorus input reductions identified within the NARP. The Agency will modify the permit if necessary.

H. If the Permittee does not develop or assist in developing the NARP and such a NARP is developed for the watershed, the Permittee will become subject to effluent limitations necessary to address the risk of eutrophication. The Agency shall calculate these effluent limits by using the NARP and any applicable data. If no NARP has been developed, the effluent limits shall be determined for the Permittee on a case-by-case basis, so as to ensure that the Permittee's discharge will not cause or contribute to violations of the dissolved oxygen or narrative offensive condition water quality standards.

The wastewater treatment facility in Harrisburg discharges into the Saline River. The Saline River is listed on the EPA 303(d) list of impaired waterbodies and is also a priority watershed for non-point source phosphorus in the Illinois Nutrient Loss Reduction Strategy (NLRS). According to the US EPA Waterbody Reports, the Saline River does not have phosphorus listed as a direct impairment. However, the river is listed in the IEPA NPDES permit for Harrisburg as being at risk of eutrophication and, as such, requires a NARP to be completed. The Saline River is a tributary of the Ohio River.

The Saline watershed affects the water quality of the larger Ohio basin, leading into the Mississippi River and the Gulf. Nutrient inputs into these watersheds contribute to the annual Gulf Hypoxic Zone- an area with low dissolved oxygen caused by excessive algal growth that forms every summer in the Gulf of Mexico. The size varies yearly depending on weather patterns and nutrient inputs upstream, but the five-year average is 5,380 square miles. This area is also known as a "dead zone" because fish, shrimp, and other aquatic life cannot survive under such harsh conditions. This harms not only the ecosystem but the economy as well. The National Oceanic and Atmospheric Administration estimates that Gulf states' fishing and tourism industries lose $82 million each year due to the hypoxic zone. Illinois is part of the 12-state Mississippi River/Gulf of Mexico Watershed Nutrient Task Force and has a statewide Nutrient Loss Reduction Strategy (NLRS) of reducing total phosphorus and nitrogen input to the Mississippi River by 45 percent. The completion of this NARP will be a part of the larger state and national goal to improve the water quality and economic status of States in the Mississippi River Basin and Gulf Shores.

1.2 Local Planning

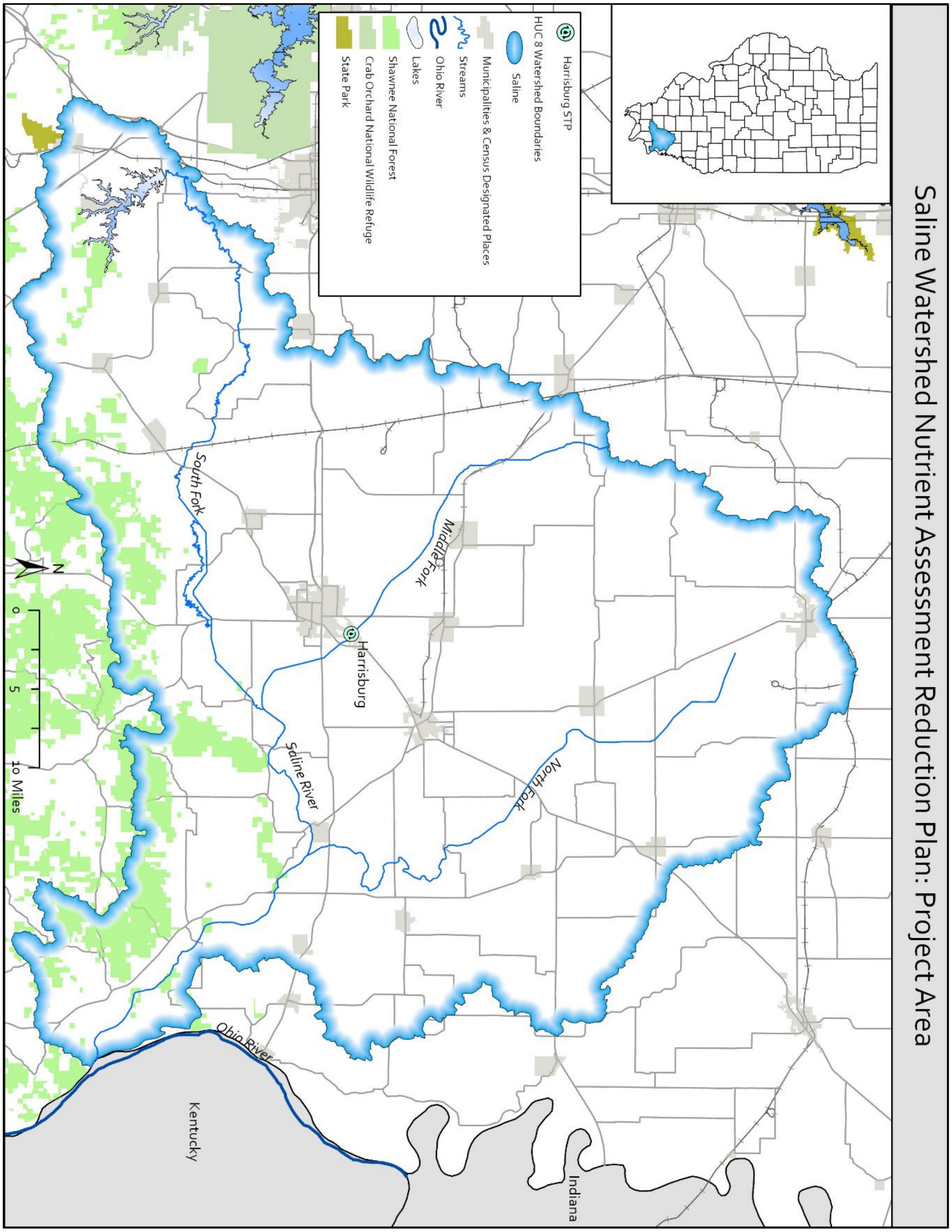
The City of Harrisburg has the only NPDES Permit requiring a NARP in the Saline River watershed. Harrisburg, acting by and through their Publicly Owned Treatment Works (POTWs), entered into an intergovernmental agreement with Greater Egypt Regional Planning and Development Commission (Greater Egypt) to develop the required NARP. Greater Egypt is classified as an areawide Water Quality Planning Agency by the IEPA and provides water quality planning services to ten counties in southern Illinois. This group was referred to as the Saline River Watershed NARP Planning Committee. The following figure details each representative on the planning committee.

Saline River Watershed Planning Team Members		
Jurisdiction	**Name**	**Title**
Harrisburg WWTP	Collins, Ryan	WWTP Operator
	Jason Haney	WWTP Superintendent
Farley Engineering	Farley, Ryan	Chief Engineer
Greater Egypt RP&DC	Tyler Carpenter	GIS & Environmental Planning Director
	Lilly Bolin	Environmental Planner
	Nick Keller	Environmental Planner
	Kelsey Bowe	Environmental Planning Coordinator

1.2.1 Project Area Cities

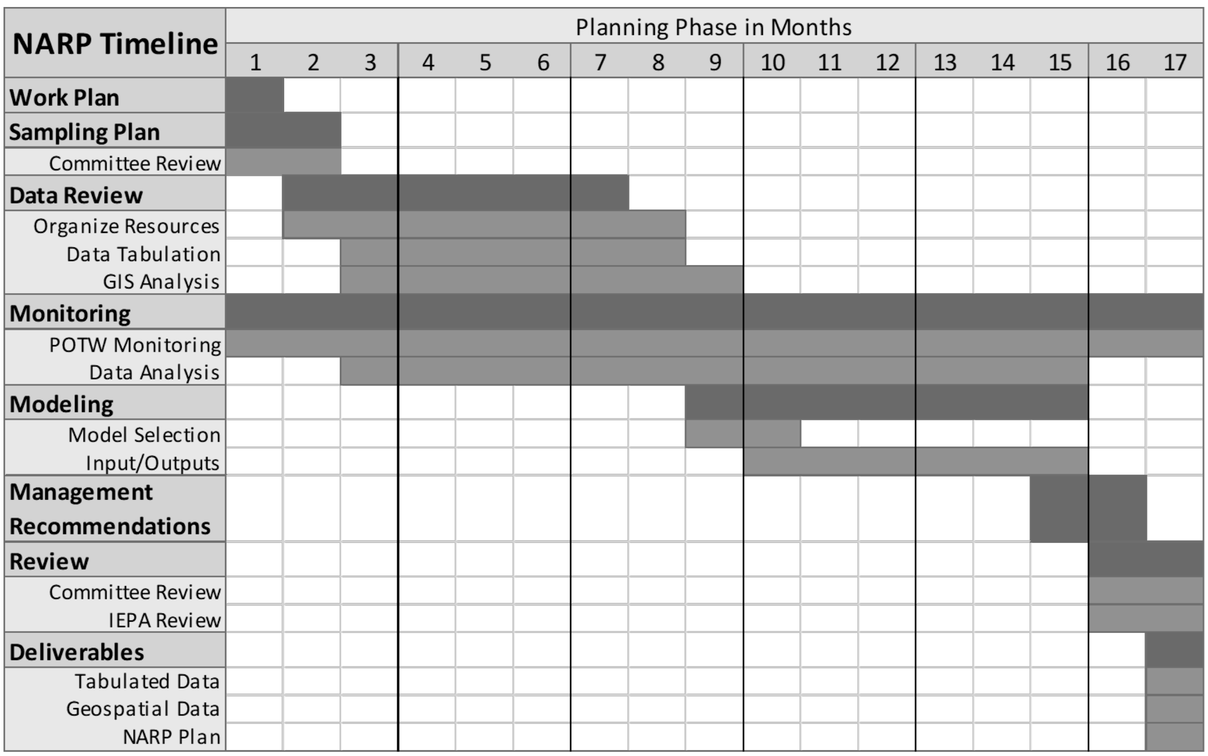
Harrisburg, Illinois

Harrisburg, Illinois, is a small city in Saline County located in the southern part of the state, near the Shawnee Hills and along the Saline River. The city serves as a local hub for commerce, education, and government services in the surrounding rural region. Harrisburg experiences a humid continental climate with hot, humid summers and cool winters, and its location in southern Illinois contributes to occasional severe weather, including thunderstorms and occasional flooding along nearby waterways. The population of Harrisburg in 2020 was 8,219.


Saline Watershed Nutrient Assessment Reduction Plan: Project Area
Harrisburg STP
HUC 8 Watershed Boundaries
Saline
Municipalities & Census Designated Places
Streams
Ohio River
Lakes
Shawnee National Forest
Crab Orchard National Wildlife Refuge
State Park
South Fork
Middle Fork
North Fork
Saline River
Harrisburg
Ohio River
Kentucky
Indiana
N
0 5 10 Miles

1.2.2 Public Participation

Saline River NARP Advisory Committee Meetings – Beginning in the summer of 2023, the Saline River Watershed NARP Advisory Committee met on a regular basis until the end of the plan- December 2025. These meetings consisted of the planning teams and any interested parties. Meeting agendas and minutes can be found at this website. The following graph illustrates the timeline for the eighteen-month NARP planning process.



Public Meeting - During the planning process, the public was invited to a public exhibit meeting with information about the NARP on September 18, 2025. Announcements were made in local media. The Shawnee Chapter – Sierra Club, Prairie Rivers Network, and other environmental agencies were forwarded the meeting announcement.

The public was explained the NARP, planning process, and activities following NARP submission. The meeting was exhibit-style with various figures, maps, and a running slideshow. Comments will be addressed in the final NARP. The slideshow can be found in **Appendix A – Public Participation.**

Agricultural Nonpoint Survey – Local agricultural service agencies, landowners, and public were encouraged to take a survey related to nonpoint source impacts in the Saline River watershed. The survey questionnaire is displayed in **Appendix A**.

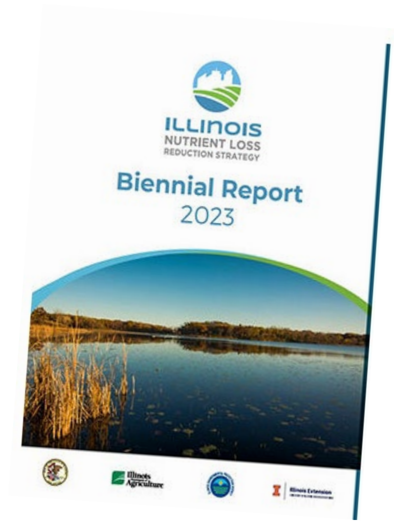
Respondents ranked water quality issues, gave information on management measures, and described challenges faced in implementing agricultural management measures including a lack of incentives and funding programs.

1.3 Other Planning Initiatives

While the NARP serves as the plan to mainly limit phosphorus at a watershed-wide scale, other initiatives have been developed to limit the nutrient and other impairments at the HUC-8 and smaller watershed scales.

1.3.1 IL Nutrient Loss Reduction Strategy (NLRS)

The Illinois Nutrient Loss Reduction Strategy (NLRS) is a statewide, science-based framework designed to reduce nitrogen (N) and phosphorus (P) losses from Illinois waterways and ultimately diminish contributions to the Gulf of Mexico hypoxic zone. It was collaboratively developed by the Illinois EPA, Illinois Department of Agriculture, academic researchers, wastewater agencies, agricultural groups, and non-governmental organizations.



Credit: IL EPA

Excessive nutrients contribute to local water-quality impairments—such as harmful algal blooms and low dissolved oxygen—and to the formation of the Gulf of Mexico "dead zone." By reducing nutrient losses, Illinois aims to protect drinking water, aquatic ecosystems, and downstream environments while improving agricultural efficiency.

Long-term goals see a 45% reduction in nitrogen and phosphorus loads with interim goals of 15%, and 25% respectively. Strategies focus on agriculture, wastewater and urban stormwater. Regarding P limits, the plan encourages facility upgrades, implement P limits through NPDES permits, and provide financial support through Illinois EPA's low-interest loan programs. The IL NLRS document and planning materials can be found here.

1.3.2 TMDL and Watershed-based Planning

Total Maximum Daily Loads (TMDL)

The Saline River watershed contains several streams, lakes, and subwatersheds that have undergone Total Maximum Daily Load (TMDL) development to address a range of water quality impairments. Across the watershed, the major issues identified in TMDL assessments include elevated metals such as manganese and iron, low dissolved oxygen, pH fluctuations, excessive sediment and total dissolved solids, sulfates, total phosphorus, and bacterial contamination.

Although each TMDL addresses specific local conditions, most of the impairments originate from nonpoint sources, including agricultural runoff, eroding streambanks and shorelines, legacy mining areas, and failing septic systems. As a result, the management strategies throughout the Saline River watershed emphasize land-based best management practices (BMPs), source reduction, and long-term watershed planning rather than relying solely on point-source controls.

Middle Fork / Harrisburg Reservoir (Saline River) TMDL

In the Middle Fork Saline River watershed, IEPA developed a TMDL to address a suite of metal and bacterial impairments—specifically copper, manganese, nickel, silver, zinc, sulfates, and fecal coliform—as well as total phosphorus in Harrisburg Reservoir. The analysis used load-duration curves to quantify how frequently and under what flow conditions the pollutants exceed allowable loads. For pH (in a branch of the watershed), the report treats acidity/alkalinity as a chemical condition rather than a simple pollutant mass.

To reduce pollutant loads, the TMDL relies on a mix of point-source load allocations (for regulated dischargers) and nonpoint-source management. Key management strategies include implementing best management practices on agricultural and disturbed lands, aimed at reducing runoff that carries metals and bacteria and controlling nonpoint fecal coliform sources through land-use planning and management (e.g., livestock management, septic system maintenance).

For the Harrisburg Reservoir, where total phosphorus is the concern, the TMDL similarly promotes nonpoint-source phosphorus reductions — via land management, riparian buffers, and possibly other nutrient-control practices — to improve water quality and limit algal growth in the reservoir.

South Fork Saline River / Lake of Egypt TMDL

This TMDL covers the South Fork Saline River and its associated reservoir, Lake of Egypt, where impairments include manganese, pH, low dissolved oxygen, total dissolved solids (TDS), and trace metals (cadmium, copper, iron, nickel, silver, zinc), plus sulfates. The report identifies both point sources (e.g., NPDES-permitted dischargers) and nonpoint sources (runoff from land) that contribute to the pollution.

Management actions prioritized include: reducing discharges from permitted facilities according to load-allocations placed by IEPA, to curtail metal inputs and implementing nonpoint-source controls based on EPA's national management measures (agricultural, urban, etc.) to limit runoff of nutrients, metals, and salts.

Saline Branch / Boneyard Creek TMDL

The TMDL for Saline Branch (including Boneyard Creek and the Saline Branch Drainage Ditch) specifically addresses impairments in pH, dissolved copper, and (historically) dissolved oxygen. This watershed is largely urban/residential, and in the Stage 1 analysis IEPA concluded that stormwater and urban runoff, rather than regulated wastewater discharges, are the predominant sources of the pollutants.

Key management measures include: reducing stormwater phosphorus loads (since urban runoff contributes a lot of TP) to help control pH and reduce risk of oxygen stress; and long-term monitoring and adaptive management, where IEPA will use load-reduction targets (based on its load-duration analyses) and track water quality over time to adjust BMP implementation as needed

Some of these TMDL are in need of an update with some of them being more than twenty years old. However, the management measures listed in them are still applicable in mitigating and correcting P and other nutrient loads in the Saline River watershed. Across all subwatersheds, the Saline River TMDLs share common themes: reliance on watershed-scale BMP implementation, use of surrogate indicators to track progress, emphasis on controlling nonpoint-source pollutants, and integration with local and regional watershed-based plans. Taken together, these TMDLs form a coordinated framework for improving hydrologic and ecological conditions throughout the Saline River basin.

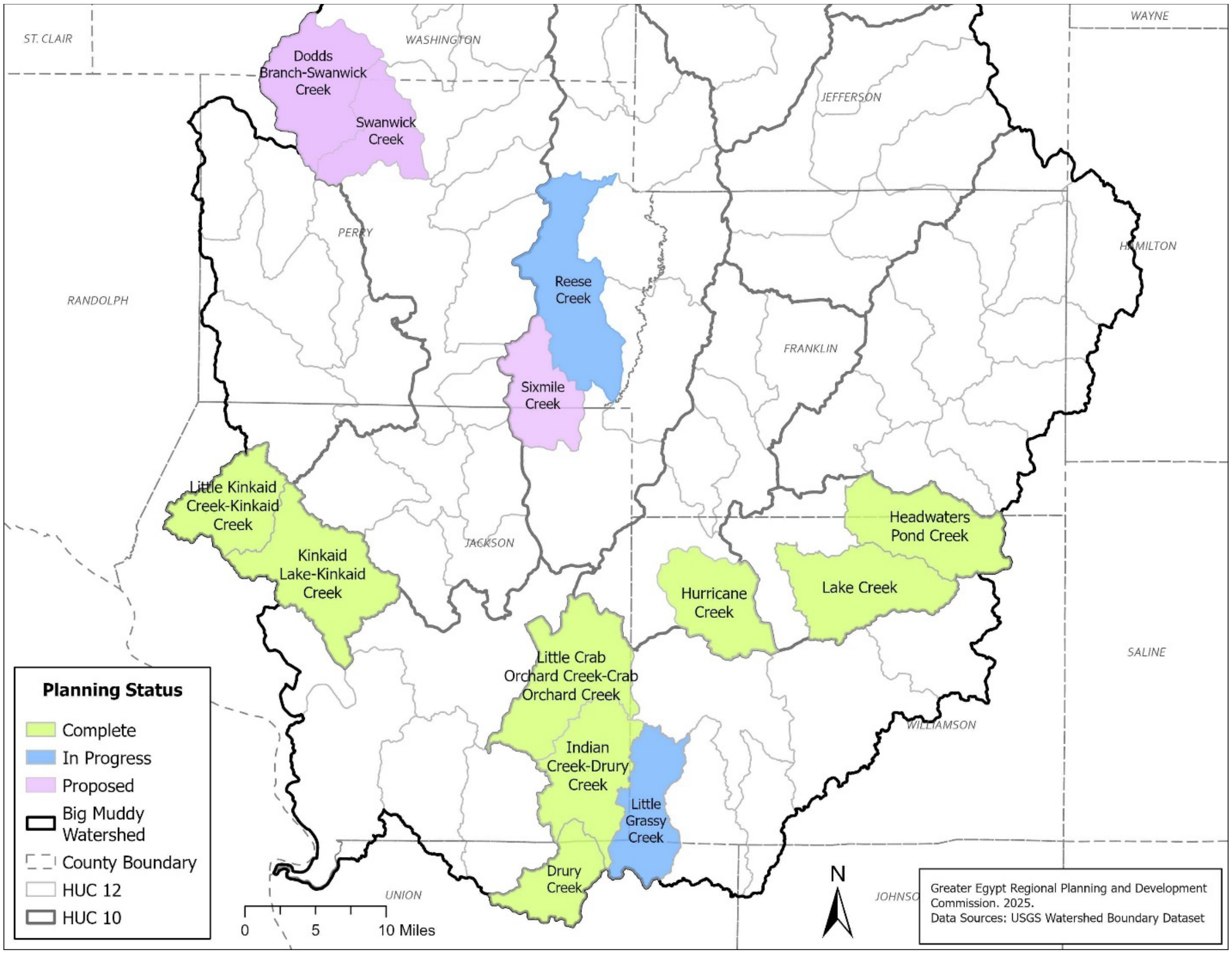
Watershed-based Planning

The Greater Egypt Regional Planning and Development Commission (GERPDC) serves as the designated Areawide Water Quality Planning Agency for southern Illinois, working under the authority of the Illinois Environmental Protection Agency. In this role, the organization leads watershed-based planning efforts designed to improve local water quality, reduce nonpoint source pollution, and guide long-term resource management across the region. Their work is rooted in community engagement, technical analysis, and alignment with state and federal water-quality programs.

A central component of Greater Egypt's work is the development of watershed-based plans for priority watersheds throughout the region. These plans are built through stakeholder-driven processes that bring together local governments, landowners, environmental organizations, lake associations, public-works departments, and interested residents. To ensure eligibility for federal Clean Water Act Section 319 funding, Greater Egypt's plans follow the U.S. EPA's "Nine Minimum Elements," which include pollutant load assessments, identification of critical areas, selection and prioritization of best management practices (BMPs), and measurable goals for water-quality improvement. GERPDC has completed watershed-based plans for several watersheds, including Kinkaid Creek, Western Crab Orchard Creek, Pond Creek, Lake Creek, and Hurricane Creek. Each plan contains a detailed inventory of local natural resources, land use patterns, hydrology, and water-quality impairments. The Commission uses tools such as GIS and the Spreadsheet Tool for Estimating Pollutant Loads (STEPL) to quantify nutrient and sediment loads and evaluate how specific management practices—such as riparian buffers, cover crops, grassed waterways, and streambank stabilization—can reduce pollution. Plans typically adopt reduction targets consistent with the Illinois Nutrient Loss Reduction Strategy, including goals for nitrogen, phosphorus, and sediment.

Beyond watershed planning, Greater Egypt coordinates Nutrient Assessment Reduction Plan (NARP) efforts for wastewater dischargers in sensitive watersheds such as the Big Muddy River and the Saline River. These advisory groups bring together municipal wastewater operators, engineers, regulators, and stakeholders to identify strategies for reducing nutrient discharges, particularly phosphorus. NARPs help communities evaluate feasible treatment technologies and build long-term nutrient-reduction pathways.

GERPDC also conducts nonpoint source pollution initiatives, including field studies that use drones to evaluate agricultural BMP performance and measure nutrient and sediment levels near treated fields. The Commission is active in stormwater education and outreach, producing materials that help residents and communities reduce pollution from urban runoff. In addition, Greater Egypt oversees the Volunteer Lake Monitoring Program for its multi-county region, training and coordinating volunteers who collect long-term data on lake water quality—data that directly supports watershed planning and evaluation. Throughout its watershed-based efforts, Greater Egypt places strong emphasis on public education, stakeholder engagement, and long-term monitoring. Plans include strategies for funding implementation, timelines for adoption, and metrics for evaluating progress over time. While challenges such as diffuse agricultural runoff, legacy nutrient storage, and limited funding persist, the Commission's combination of technical expertise, community partnerships, and adherence to EPA planning standards positions as a key leader in protecting and improving water quality in southern Illinois.



1.4 Challenges to Planning

Plan Funding – Currently, no grant or state assistance exists to assist communities with funding NARP planning. In 2023, Greater Egypt submitted a grant application for the Delta Regional Authority's Strategic Planning Grant Program. Unfortunately, this was not awarded. The planning partners funded the NARP through a collaborative pool. Along with funding the planning, the operator was required to take a chlorophyll sample twice a month, costing around an additional $200 per month during the planning process.

Watershed-wide Planning – The Saline River watershed is around 1,800 square miles. Variables like the weather can affect planning. Even with a sampling plan (Section 3.1) in place, some data was not taken. This can tend to skew data and results.
Sustaining NARP or other watershed committees, continuing project implementation, and measuring success of the plan can be difficult. The Saline River basin is massive; containing a few other municipalities that are not represented in the NARP. Coordination will need to be continuous through plan implementation. If needed, additional cities with a NARP requirement may be added to the existing Saline Rvier Watershed NARP Committee.

Nonpoint Planning Partners - Traditional nonpoint planning partners include large landowners and farmers. Nonpoint source pollution (particularly from agriculture) is complex and diffuse, making implementation of BMPs and behavior change difficult. Because many of the management measures in this plan are agricultural, an approach will need to be created to discuss these measures to the target audience.

2. Saline River Watershed

The Saline River watershed is a Hydrologic Unit Code (HUC) 8 watershed encompassing the floodplain and waterbodies connected to the Saline River. This includes a drainage area of 1,762 square miles, with major tributaries of South Fork, Middle Fork, and North Fork. This report will reference the Saline River and any waterbodies directly associated with the NARP treatment plants as the planning, or study area. The figure below outlines the relevant locations relative to the Saline River Watershed.

2.1 Watershed Geography and Land Use

The Saline River watershed encompasses portions of six counties, but the study area focuses on Saline County, where Harrisburg is located. This NARP focuses on Middle Fork upstream of the Saline River where the Harrisburg wastewater treatment plant's outfall sits, then follows the course of the Saline River for the rest of the project area.

While there are multiple municipalities within the planning area, the only one extensively discussed in this is Harrisburg, as its WWTP is the only one that fits the criteria for inclusion in the NARP. As one of the largest cities in the watershed, it contributes more to the overall health of the watershed more than the smaller municipalities do.

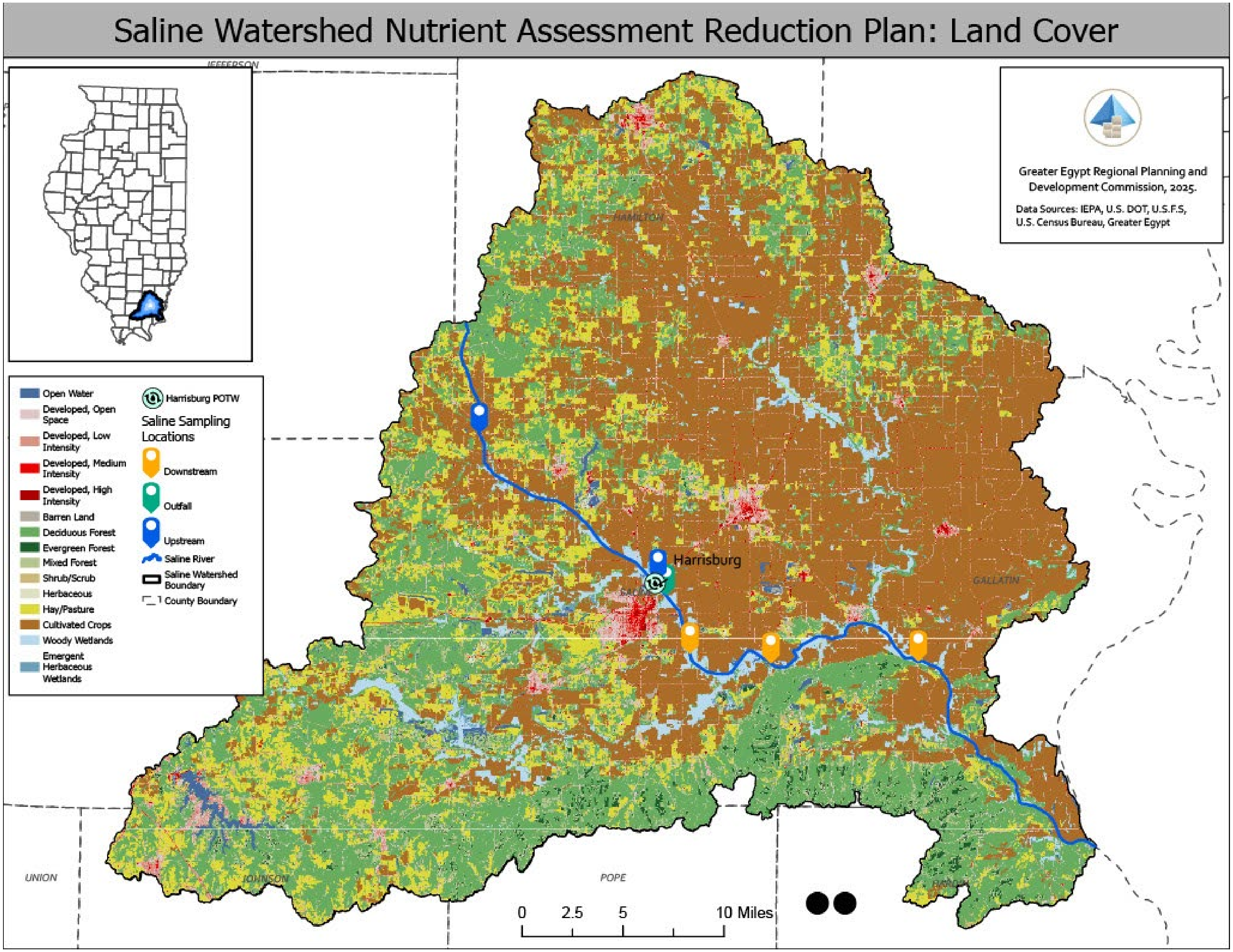
The climate in the Saline River watershed area borders the humid subtropical and humid continental climates. The weather in the region is influenced by warm air from the gulf, cold dry air from Canada, and eastward air from the southwest. The terrain has little impact on the climate.

During the spring and summer months, damaging storms and heavy rainfall can be expected. Heavy rainfall usually leads to regional and localized flooding. Like most areas in the Midwest, the watershed is susceptible to tornadoes. Winters occasionally bring accumulations of snow and ice, which can cause similar water quality changes when melting.

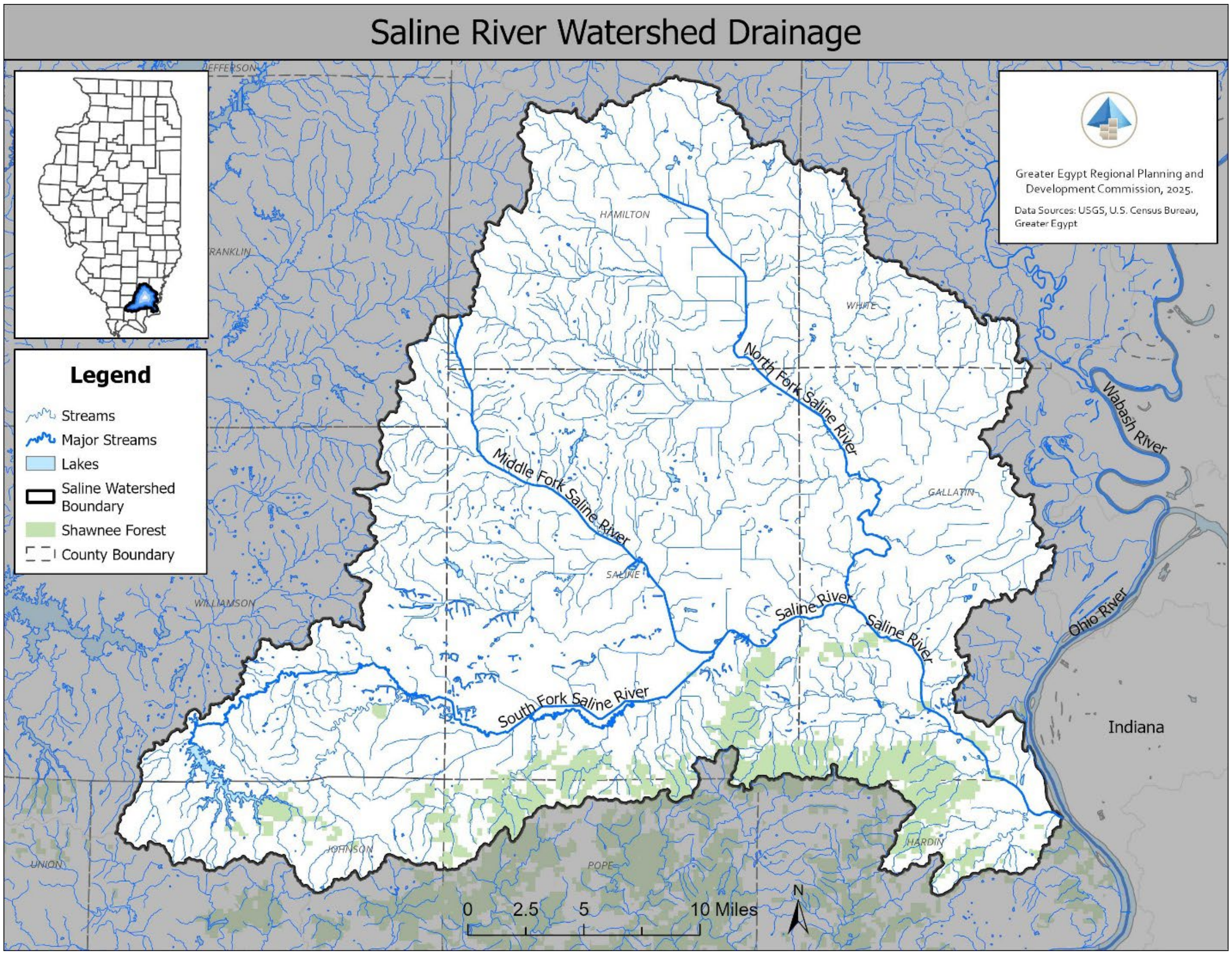
Land cover is largely agricultural, with 56 percent of the watershed being classified as cultivated crops and pasture/hay. Notably, most of the agricultural sources are north of the Middle Fork Saline River where municipalities are not required to be part of the NARP.

Color Code	NLCD Land Cover Class	Area (sq miles)	Percent of total area
	Cultivated Crops	493.6	41.92
	Deciduous Forest	324.3	27.54
	Hay/Pasture	166.3	14.12
	Developed, Open Space	44.8	3.81
	Woody Wetlands	39.9	3.39
	Mixed Forest	33.3	2.82
	Developed, Low Intensity	27.1	2.30
	Open Water	15.1	1.28
	Evergreen Forest	10.7	0.91
	Developed, Medium Intensity	7.5	0.64
	Shrub/Scrub	4.2	0.36
	Herbaceous	3.8	0.32
	Emergent Herbaceous Wetlands	3.5	0.30
	Developed, High Intensity	1.7	0.14
	Barren Land	1.6	0.13

With almost a third of the land use being forested, this is mainly exhibited in the southern portion of the watershed along the northern border of the Shawnee National Forest. Development is mainly represented by municipalities and the road network of southern Illinois.


Saline Watershed Nutrient Assessment Reduction Plan: Land Cover
JEFFERSON
HAMILTON
GALLATIN
UNION
JOHNSON
POPE
HARDIN
Harrisburg
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Herbaceous
Hay/Pasture
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Harrisburg POTW
Saline Sampling Locations
Downstream
Outfall
Upstream
Saline River
Saline Watershed Boundary
County Boundary
Greater Egypt Regional Planning and Development Commission, 2025.
Data Sources: IEPA, U.S. DOT, U.S.F.S, U.S. Census Bureau, Greater Egypt
0 2.5 5 10 Miles

2.2 Waterbodies and Drainage



2.3 Demographics and Stakeholders

County	Unemployment Rate	Total Employment	Top Three Industries
Saline	5%	9,013	Health Care and Social Assistance, Retail Trade, Educational Services

County	Population (Pop Estimates)	Population Annual Average Growth	People per Square Mile
Saline	23,768	-0.71%	60
Harrisburg	8,219		

County	Median Age	Median Household Income
Saline	43	$54,945
Harrisburg	38	$48,488

3. Water Quality Assessment

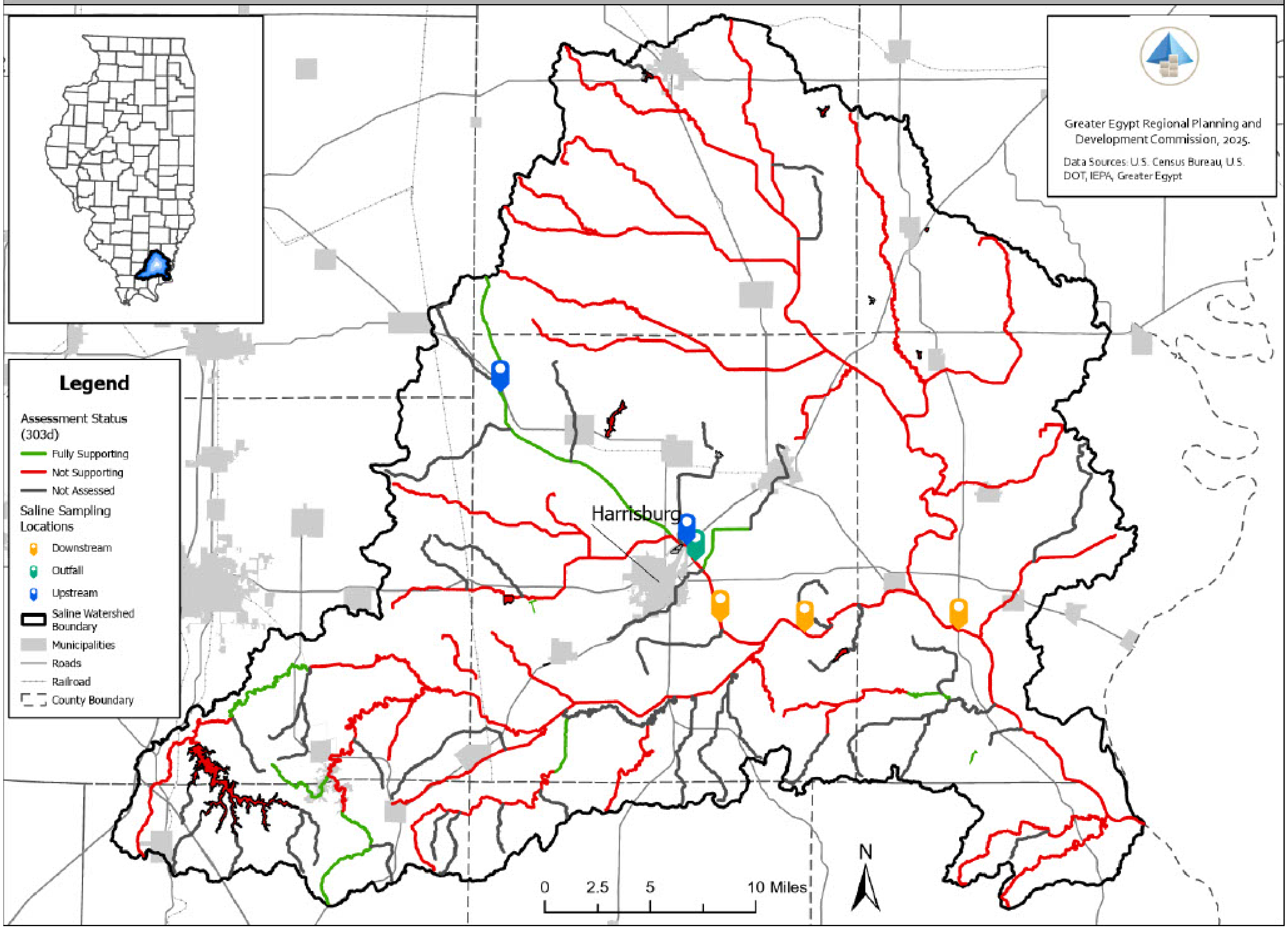
The water quality assessment for the NARP includes a sampling plan, additional water quality data analysis, and mapping/modeling of the watershed, specifically phosphorus outputs.

3.1 Water Quality Impairments and Monitoring

Many waterbodies in the Saline River watershed are included in the Illinois EPA's 303d List of Impaired waterbodies. This includes many segments of rivers and streams within the NARP Sampling plan including the Middle Fork Saline and Saline Rivers.

Waterbody	Assessment Unit ID	Size	Impaired Designated Use (s)	Causes of Impairment(s)
Lake(s)		(Acres)		
Harrisburg Resv.	IL_RAI	208.9	Aesthetic Quality	Total Suspended Solids (TSS), Phosphorous, total
Stream(s)		(Miles)		
Bankston Fork	IL_ATGC-01	4.38	Aquatic Life	Manganese, Silver, Sulfate
Bankston Fork	IL_ATGC-01	4.38	Primary Contact	Fecal Coliform
Bankston Fork	IL_ATGC-11	7.22	Aquatic Life	Nickel
Brier Creek	IL_ATHS-01	3.47	Aquatic Life	Total Suspended Solids (TSS)
Indian Creek	IL_JQA-01	23.34	Aquatic Life	Cause Unknown
Indian Creek	IL_DKD-01	6.38	Aquatic Life	Total Suspended Solids (TSS), Phosphorous, total
Indian Creek	IL_DJFC	8.92	Aquatic Life	Sedimentation/Siltation, Total Suspended Solids (TSS), Phosphorous, total
Indian Creek	IL_DJL-01	26.51	Primary Contact	Fecal Coliform
Indian Creek	IL_DTZK	7.86	Aquatic Life	Dissolved Oxygen
Indian Creek	IL_DTZK	7.86	Primary Contact	Fecal Coliform
North Fork Saline River	IL_ATF-04	5.21	Aquatic Life	pH
North Fork Saline River	IL_ATF-04	5.21	Fish Consumption	Mercury
North Fork Saline River	IL_ATF-05	7.95	Aquatic Life	Cause Unknown
North Fork Saline River	IL_ATF-06	14.62	Aquatic Life	Dissolved Oxygen
North Fork Saline River	IL_ATF-06	14.62	Fish Consumption	Mercury
North Fork Saline River	IL_ATF-07	5.62	Aquatic Life	Chloride
Little Saline Creek	IL_ATHJ-01	7.16	Aesthetic Quality	Phosphorous, total
Little Saline Creek	IL_ATHJ-01	7.16	Aquatic Life	Cause Unknown
Little Saline Creek	IL_ATHJ-LE-C1A	0.7	Aquatic Life	Total Suspended Solids (TSS)
Little Saline River	IL_ATHD-03	13.63	Aquatic Life	Dissolved Oxygen
Middle Fork Saline River	IL_ATG-03	7.44	Aquatic Life	Nickel
Saline Branch Drainage Ditch	IL_BPJC-06	3.12	Primary Contact	Fecal Coliform
Saline River	IL_AT-05	9.6	Aquatic Life	Cause Unknown
Saline River	IL_AT-05	9.6	Fish Consumption	Mercury
Saline River	IL_AT-06	10.44	Aquatic Life	Dissolved Oxygen
Saline River	IL_AT-06	10.44	Fish Consumption	Mercury
Saline River	IL_AT-07	7.23	Aquatic Life	Sedimentation/Siltation, Total Suspended Solids (TSS), Phosphorous, total
Saline River	IL_AT-07	7.23	Fish Consumption	Mercury
South Fork Saline River	IL_ATH-02	8.11	Aquatic Life	Cadmium
South Fork Saline River	IL_ATH-02	8.11	Primary Contact	Fecal Coliform
South Fork Saline River	IL_ATH-13	12.68	Aquatic Life	Nickel
South Fork Saline River	IL_ATH-14	4,12	Aquatic Life	Cause Unknown
	Indicates Part of Sampling Plan			

Saline Watershed Nutrient Assessment Reduction Plan: Assessed Waterbodies



3.2 Sampling Plan

The sampling plan was a coordinated effort between all planning partners in the Saline River watershed. The sampling plan goes beyond the traditional outfall monitoring, creating additional upstream and downstream water quality monitoring locations. The plan was forwarded to Illinois EPA in 2024 to be fully implemented in 2025. The Sampling Plan is summarized below. See **APPENDIX B** for all contents of the *Saline River Watershed NARP Sampling Plan* submitted to Illinois EPA.

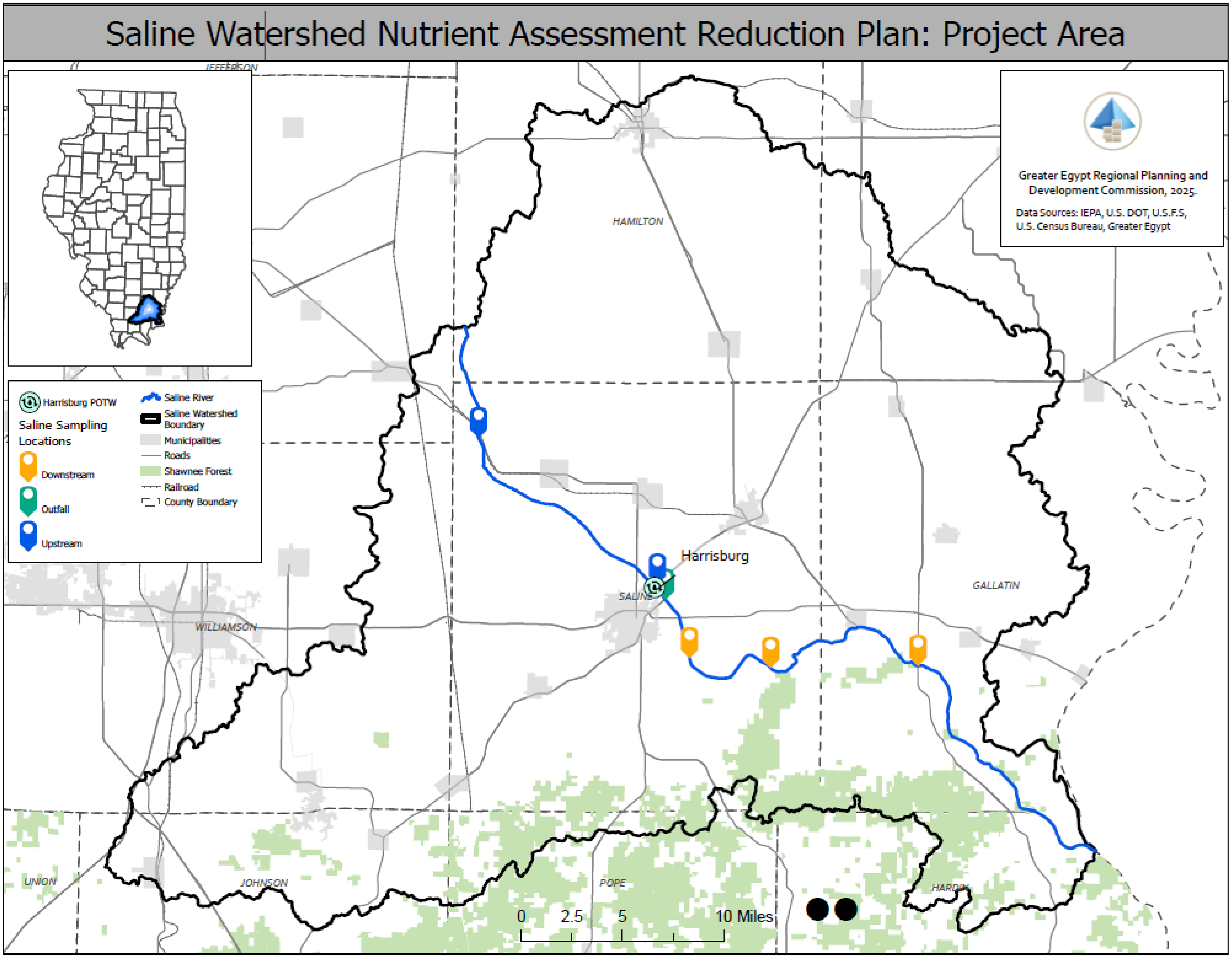
The Saline River Watershed Nutrient Assessment Reduction Plan (NARP) Sampling Plan was developed after the Illinois Environmental Protection Agency required the City of Harrisburg's municipal wastewater operators to participate in a coordinated watershed effort to address the risk of eutrophication in local streams driven largely by elevated phosphorus. In response the municipality formed the Saline River NARP Advisory Group in 2023 and partnered with the Greater Egypt Regional Planning and Development Commission to guide planning, coordination, and compliance activities. Early efforts focused on organizing the group, outlining objectives for the full NARP, assessing available data, and establishing a unified approach to monitoring, and eventual nutrient-reduction recommendations. A central early milestone was the creation of a comprehensive sampling plan for review by IEPA.

The sampling plan establishes a watershed-wide monitoring framework built around consistent measurement of key water-quality parameters that indicate nutrient impacts and potential eutrophication. These include phosphorus, nitrogen forms, dissolved oxygen, pH, suspended solids, fecal coliform, temperature, $CBOD_5$, chlorine residual, and chlorophyll-a—the latter collected from April through October to help evaluate algal productivity. All laboratory analyses, including chlorophyll-a, will be conducted through Pace Analytics to maintain data consistency. Sampling will take place twice monthly, on the first and third Tuesday, with flexibility for communities that must sample as close as possible to the designated time.

To capture conditions around the wastewater treatment plant, sampling locations were set upstream, at the outfall, and downstream. Where necessary, new sites were selected based on access and stream crossings. Additional stations were added at the sites in the table below.

The data generated from this coordinated effort will feed into water-quality modeling, support evaluation of eutrophication risk, and ultimately guide phosphorus-reduction strategies and best management practices. The full NARP, incorporating monitoring, analysis, modeling, and recommended input reductions, is scheduled for submission to IEPA by December 31, 2025.

Saline River NARP	Sample Location			Waterbody/ Receiving Water	NPDES Permit No.
	Site	Latitude	Longitude		
Harrisburg	Outfall 001	37.751183	-88.513853	Middle Fork Saline River	IL0029149
	Upstream McFarland Rd	37.866917	-88.683461	Middle Fork Saline River	
	Upstream	37.762035	-88.521372	Middle Fork Saline River	
	Downstream Ingram Hill Rd	37.709254	-88.492314	Middle Fork Saline River	
	Downstream Rocky Branch Rd	37.702381	-88.419274	Saline River	
	Downstream Il-1	37.703829	-88.286069	Saline River	


Saline Watershed Nutrient Assessment Reduction Plan: Project Area
Harrisburg POTW
Saline Sampling Locations
Downstream
Outfall
Upstream
Saline River
Saline Watershed Boundary
Municipalities
Roads
Shawnee Forest
Railroad
County Boundary
Greater Egypt Regional Planning and Development Commission, 2025.
Data Sources: IEPA, U.S. DOT, U.S.F.S, U.S. Census Bureau, Greater Egypt
JEFFERSON
HAMILTON
WILLIAMSON
SALINE
Harrisburg
GALLATIN
UNION
JOHNSON
POPE
HARDIN
0
2.5
5
10 Miles

3.3 Data Review

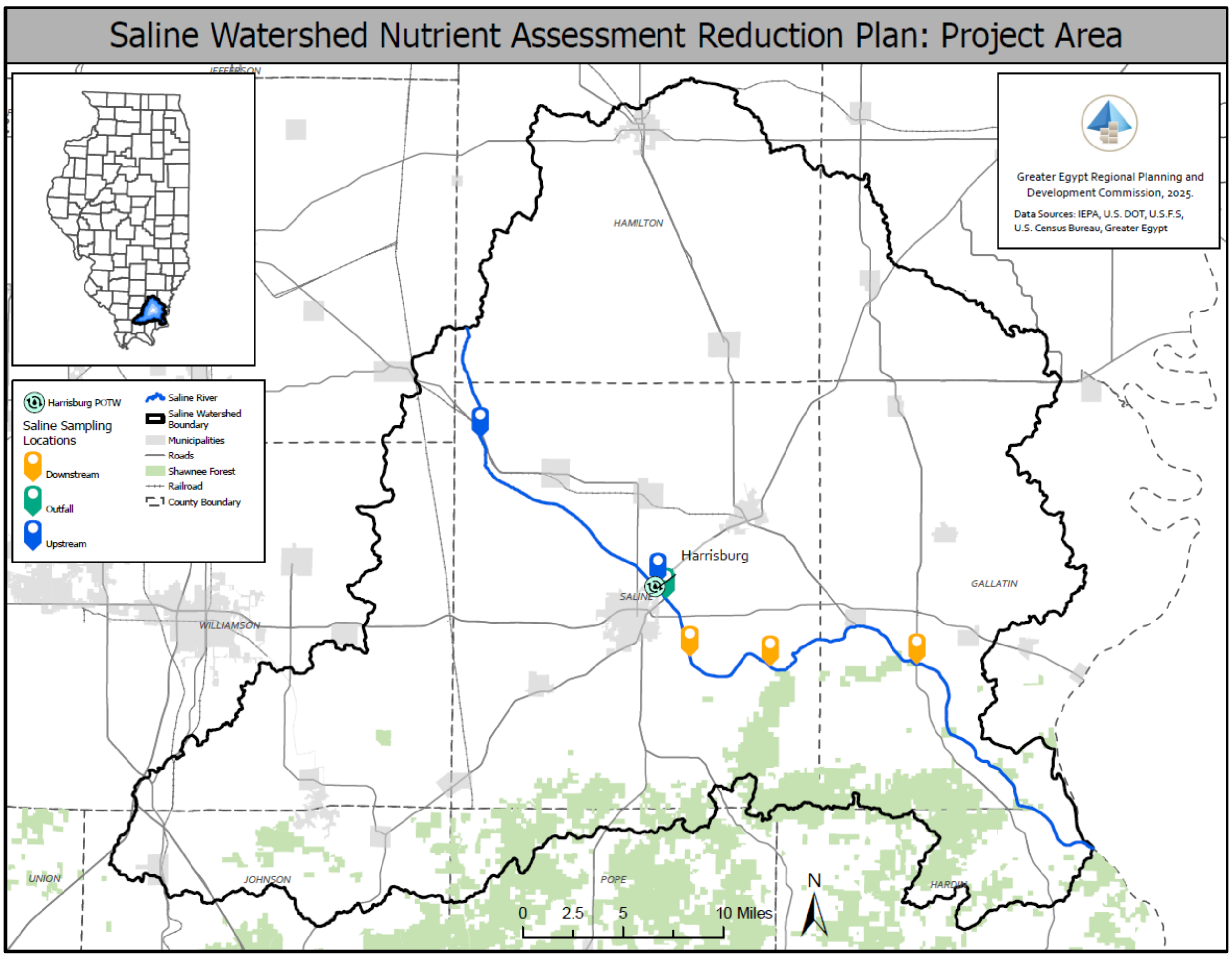
While samples were collected directly by the participating WWTP over the course of the NARP planning process, additional data points were sourced from the National Water Quality Monitoring Council for the sake of gathering more extensive data from a longer period. Locations were chosen based on relevance and sampling dates. Both data points recorded nutrient data starting in 1999 and going to 2022. Figure 3 shows the locations of each supplementary data point, and the corresponding table shows the location, source, years, and types of information included in each point.

Table 4: Details on supplemental data gathered from NWQMC.

Site ID	Organization	Start Year	End Year	Latitude	Longitude	Data Types
IL_EPA_WQX-B91955400	IEPA	1999	2022	37.70778	-88.49194	Phosphorous, Nitrogen, Nitrate, Nitrite
IL_EPA_WQX-B90493900	IEPA	1999	2022	37.64774	-88.2411	Phosphorous, Nitrogen, Nitrate, Nitrite

3.4 Sampling Plan Results

In the Saline River Watershed only the Harrisburg WWTP was required to conduct a NARP. The goal of this NARP monitoring effort was to examine the effect of the WWTP on eutrophication levels in the watershed. Due to the cost of monitoring, a discrete monitoring sample plan was developed. The Harrisburg WWTP was scheduled to collect at each location, twice a month. This consistent sampling schedule was established to maintain comparability and minimize the effects of diurnal flow patterns. For the Saline River sampling plan the Harrisburg WWTP was to sample two points upstream and three points downstream. The sample locations can be seen in the following figure.



There were six total measurements collected at these sample sites. They were pH, Temperature, Dissolved Oxygen, Phosphorus, Chlorophyll-A (Chl-A) and Ammonia Nitrogen (A.N.). All samples were set to be collected throughout the entirety of the plan except for Chl-A, which was only planned to be sampled from April through October.
To visualize the change in the water samples over the time frame of this study, the data from each water sample location was averaged over a three-month period to smooth visualizations of the changes in the watershed that occur over the year. Line graphs of the average water samples for each measurement can be seen in the figures on the following pages. The risks for eutrophication criteria are as follows:

- Its pH exceeds 9.0, the upper limit of the water quality standard;
- Its median sestonic chlorophyll a is greater than 26 mg/L; or
- Its pH exceeds 8.35 and its dissolved oxygen is greater than 110% on the same day, for two or more days from Illinois EPA sampling.

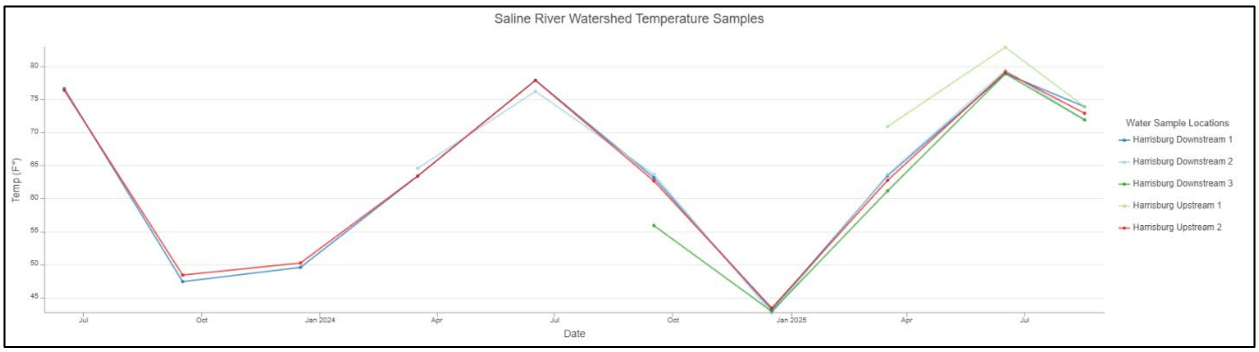
None of the water samples exceeded 9.0 on the pH scale. However, there was a sample that was recorded at 9.0. This sample location was the upstream 2 location which is the closest upstream from the WWTP outfall. On that same day the downstream 1 sample had a pH of 8.3. This could suggest that WWTP is not the main contributor to any exceedingly high pH sample.

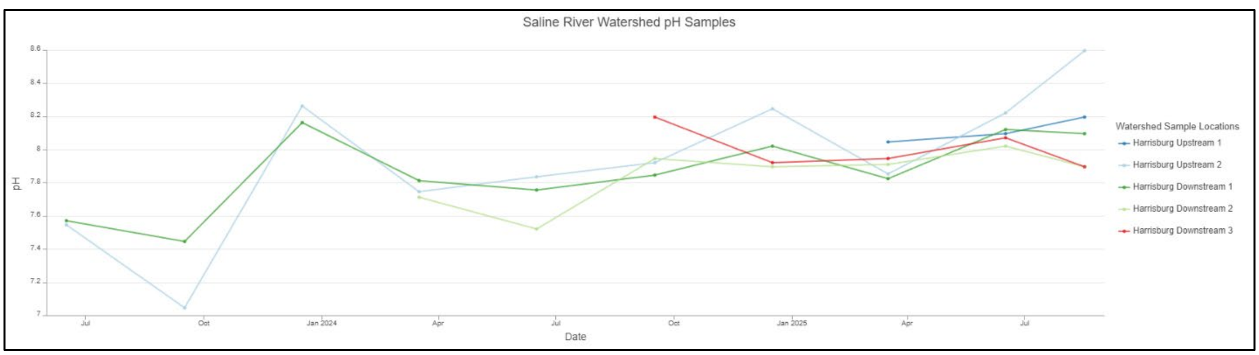
None of the water sample locations had a median Chl-A of greater than 26 mg/L. The highest Chl-A sample recorded was only 14 mg/L.

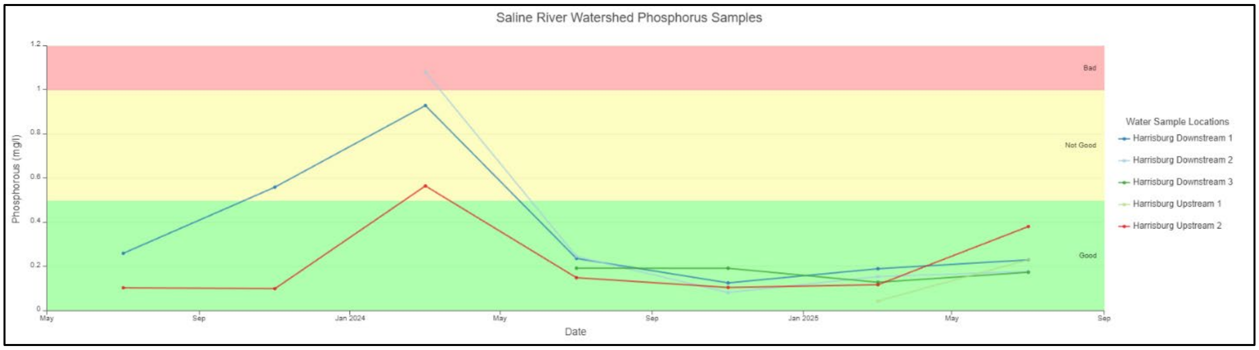
The last risk factor of a pH greater than 8.35 and a dissolved oxygen greater than 110% was only measured twice. They were both recorded on the same day 2/21/24, at two different locations, (Upstream 2 and Downstream 1). Those water samples can be seen in the table below. According to the United States Geologic Survey, (USGS) dissolved oxygen concentrations tend to be higher when the water is colder as it can hold more dissolved oxygen in colder water. Without continuous monitoring data it cannot be shown that the dissolved saturation was above the 100% threshold for consecutive days.

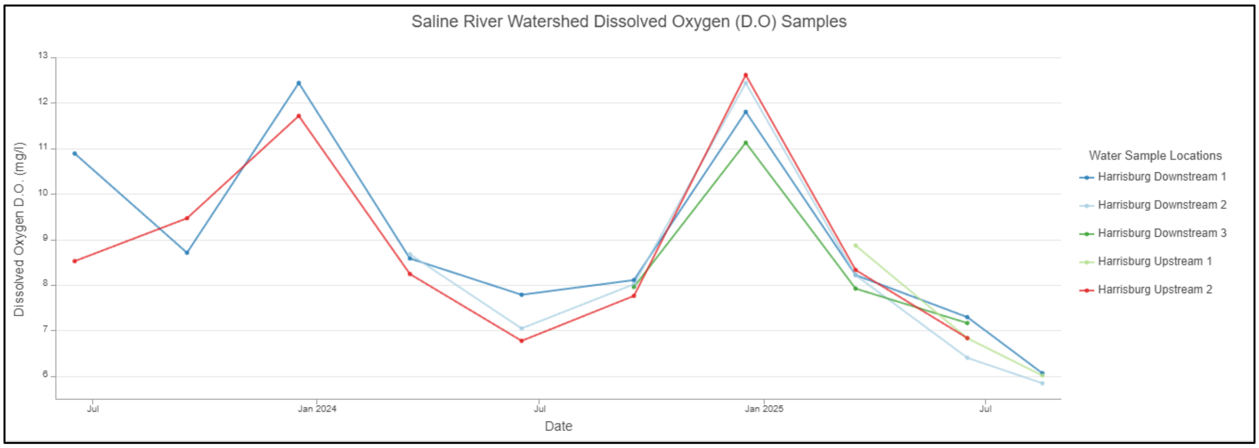
Location	Date	Temp (°F)	pH	D.O. (mg/L)	D.O. Saturation	Visual
Harrisburg Downstream 1	2/21/2024	54	8.4	13.12	123.77%	high, clear, flowing
Harrisburg Upstream 2	2/21/2024	56	8.4	12.61	121.93%	high, clear, flowing

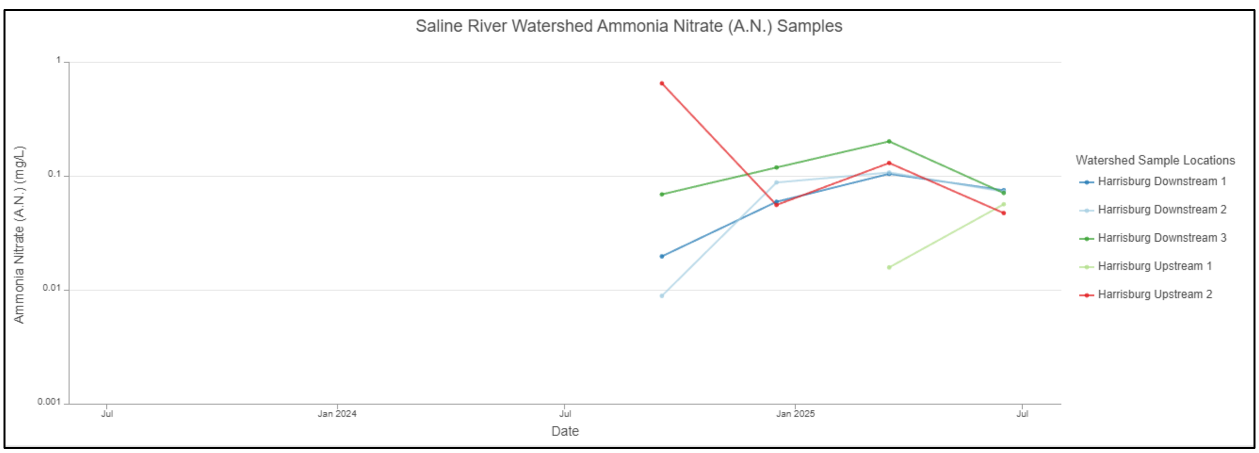
To further examine the WWTP impact on the watershed a comparison of the point-source and non-point source phosphorus loads was also conducted. The results are discussed in the following modeling section.

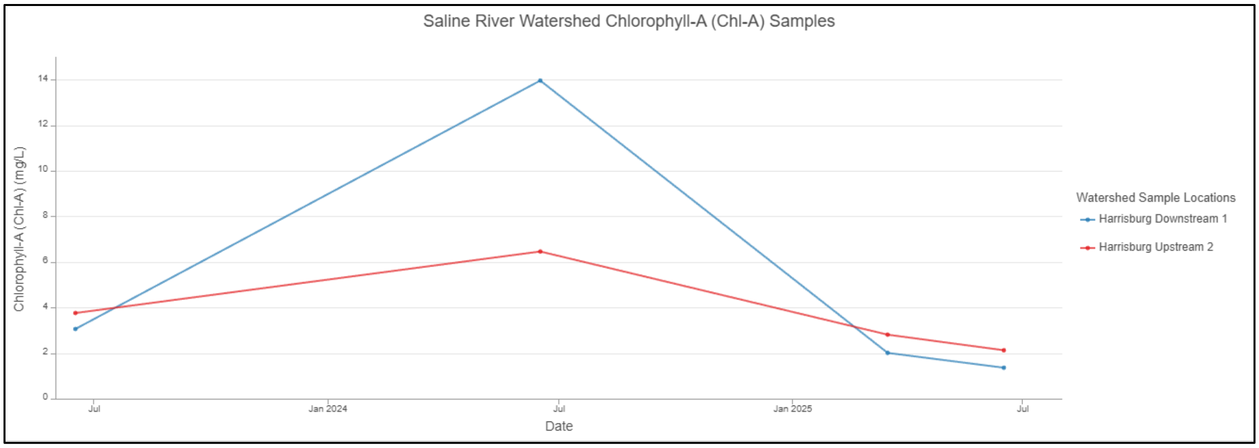





Saline River Watershed Phosphorus Samples
Phosphorous (mg/l)
1.2
1
0.8
0.6
0.4
0.2
0
Bad
Not Good
Good
May
Sep
Jan 2024
May
Sep
Jan 2025
May
Sep
Date
Water Sample Locations
Harrisburg Downstream 1
Harrisburg Downstream 2
Harrisburg Downstream 3
Harrisburg Upstream 1
Harrisburg Upstream 2


Saline River Watershed Dissolved Oxygen (D.O) Samples
Dissolved Oxygen D.O. (mg/l)
13
12
11
10
9
8
7
6
Jul
Jan 2024
Jul
Jan 2025
Jul
Date
Water Sample Locations
Harrisburg Downstream 1
Harrisburg Downstream 2
Harrisburg Downstream 3
Harrisburg Upstream 1
Harrisburg Upstream 2


Saline River Watershed Ammonia Nitrate (A.N.) Samples
Ammonia Nitrate (A.N.) (mg/L)
1
0.1
0.01
0.001
Jul
Jan 2024
Jul
Jan 2025
Jul
Date
Watershed Sample Locations
Harrisburg Downstream 1
Harrisburg Downstream 2
Harrisburg Downstream 3
Harrisburg Upstream 1
Harrisburg Upstream 2



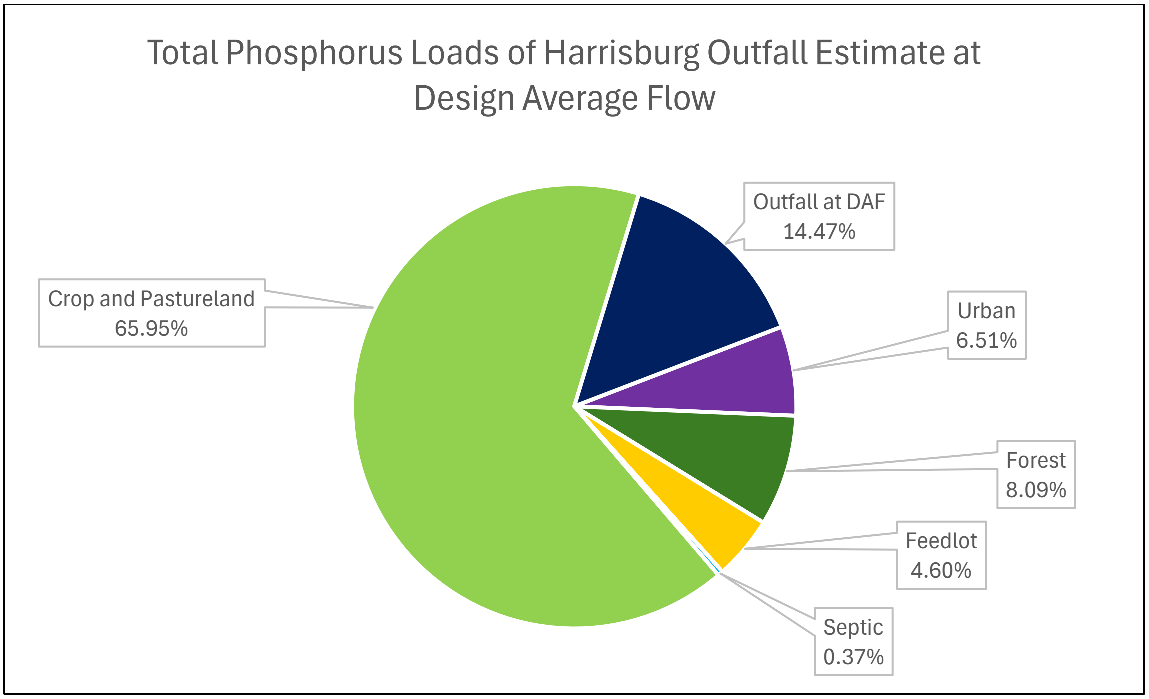
Saline River Watershed Chlorophyll-A (Chl-A) Samples
Chlorophyll-A (Chl-A) (mg/L)
0
2
4
6
8
10
12
14
Jul
Jan 2024
Jul
Jan 2025
Jul
Date
Watershed Sample Locations
Harrisburg Downstream 1
Harrisburg Upstream 2

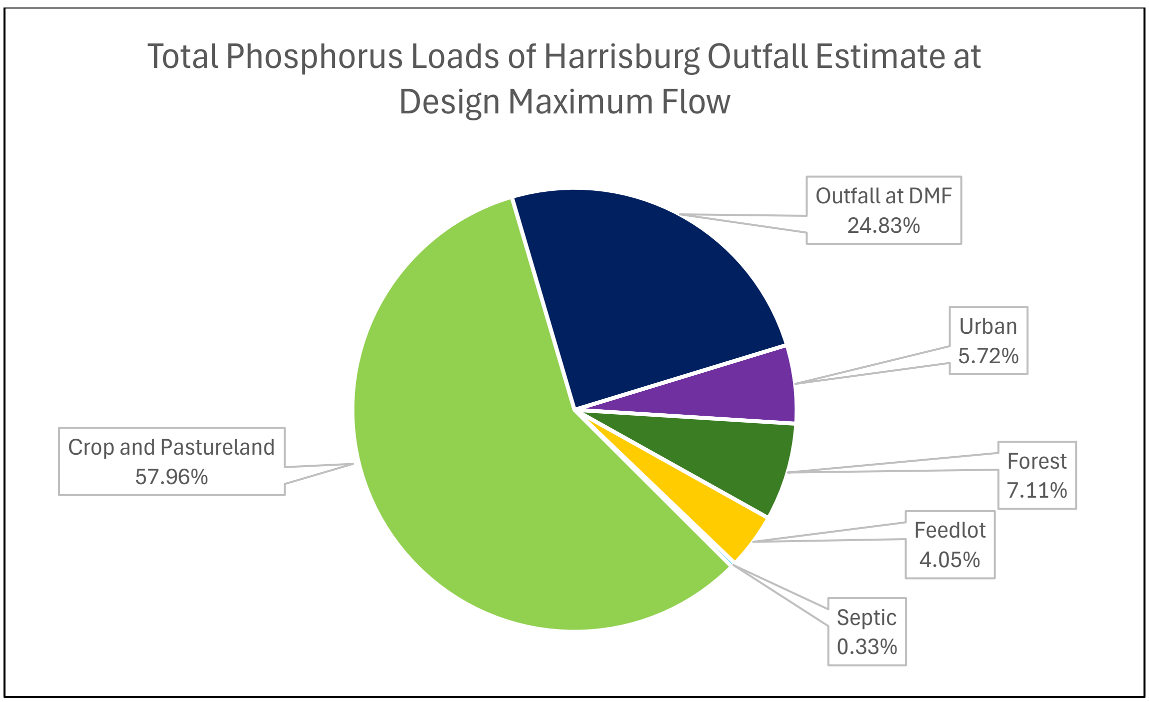
3.5 Watershed Analysis

PLET Comparison Section

Using the Pollutant Load Estimation Tool (PLET) from the EPA, non-point source pollution estimated for the sub watersheds corresponding with the WWTP water sample locations. To conduct a comparison of the point-source pollution, (WWTP outfall), and non-point source pollution. The average phosphorus water samples from the nearest downstream location were used to calculate the amount of total phosphorus loads generated by the outfall of the Harrisburg WWTP, since the actual outfall data was not submitted. The downstream samples were used to convert to the same measurment as the PLET model (lbs./year). The water sample data was calculated at the design average flow (DAF) of the outfall and the maximum design flow (DMF) of the outfall pipe. The flow values came from the NPDES permits of the WWTP. The calculations can be seen in the following figures. The average phosphorus downstream sample was .50. This resulted in an estimated 14.47% of the total phosphorus at the design average flow and 24.83% of the total at the maximum design flow. This shows that if the WWTP was depositing water at the maximum flow for an entire year it is still less than one quarter of the total phosphorus load for that HUC12.

Harrisburg Outfall Estimate (2024)	
Average Phosphorus (mg/l)	0.50
Phosphorus (lbs./yr) at Maximum Flow	4755.91
Phosphorus (lbs./yr) at Average Flow	2435.02
Total Phosphorus of Corresponding HUC 12	14396.00
Total Phosphorus in HUC 12 at Outfall Maximum Flow	19151.91
Total Phosphorus in HUC 12 at Outfall Average Flow	16831.02
Percent of Phosphorus in HUC 12 from Outfall at Maximum Flow	24.83%
Percent of Phosphorus in HUC 12 from Outfall at Average Flow	14.47%


Total Phosphorus Loads of Harrisburg Outfall Estimate at Design Average Flow
Outfall at DAF 14.47%
Crop and Pastureland 65.95%
Urban 6.51%
Forest 8.09%
Feedlot 4.60%
Septic 0.37%


Total Phosphorus Loads of Harrisburg Outfall Estimate at Design Maximum Flow
Outfall at DMF 24.83%
Urban 5.72%
Crop and Pastureland 57.96%
Forest 7.11%
Feedlot 4.05%
Septic 0.33%

PLET Model Phosphorus Loads by Land Use

Watershed	Beaver Creek-Saline River	Horseshoe Creek-South Fork Saline River	Lawler Ditch-Saline River	Pankey Branch-Middle Fork Saline River	Wolf Creek-Middle Fork Saline River	Gassaway Branch-Middle Fork Saline River	Prairie Creek-Middle Fork Saline River
HUC 12	051402040707	051402040305	051402040703	051402040207	051402040205	051402040202	051402040201
Urban Phosphorus (lbs/year)	749	1,106	820	1,096	4,944	1,633	2,129
Urban	4.88%	8.81%	6.68%	7.61%	25.36%	9.64%	5.79%
Cropland Phosphorus (lbs/year)	9,793	9,337	10,461	10,178	10,766	9,625	21,977
Cropland	63.77%	74.39%	85.18%	70.70%	55.22%	56.84%	59.77%
Pastureland Phosphorus (lbs/year)	965	152	147	922	1,052	1,658	6,616
Pastureland	6.28%	1.21%	1.20%	6.40%	5.40%	9.79%	17.99%
Forest Phosphorus (lbs/year)	3,666	1,368	674	1,362	675	1,002	2,912
Forest	23.87%	10.90%	5.49%	9.46%	3.46%	5.92%	7.92%
Feedlot Phosphorus (lbs/year)	181	579	172	775	2,044	3,003	3,121
Feedlot	1.18%	4.61%	1.40%	5.38%	10.48%	17.73%	8.49%
Septic Phosphorus (lbs/year)	4	9	7	63	14	12	17
Septic	0.02%	0.07%	0.05%	0.44%	0.07%	0.07%	0.05%
Crop and Pastureland Phosphorus (lbs/year)	10,758	9,489	10,608	11,100	11,818	11,283	28,593
Crop and Pastureland	70.05%	75.60%	86.38%	77.10%	60.62%	66.63%	77.76%
Total Phos. (lbs/year	15,358	12,551	12,281	14,396	19,495	16,933	36,772

4. NARP Strategy and Work Plan

The following section outlines the strategy to implement the NARP. This includes point and non-point source management recommendations, breakdown of technical and financial assistance needed, implementation and monitoring strategy, and detailing how the current NARP meets the IEPA requirements.

4.1 Management Actions

Management measures for the plan have been separated into point and nonpoint sources. These measures have been taken from each municipality's Phosphorus Optimization Plans or other NPDES Planning requirements. Current implementation is also being reported such as the construction of the new wastewater facility in Carterville. Measures have also been categorized as biological or mechanical. Implementation will be based on the potential increase of phosphorus standards from Illinois EPA; with the highest limits (0.1 mg/L) requiring more comprehensive measures such as structural components.

4.1.1 Point Sources

Point source management actions have been described to mitigate and reduce phosphorus loads at the treatment facilities. These actions vary on levels of p reduction, so larger actions requiring more funding are reserved for more stringent restrictions like 0.1mg/L,

Planning

Phosphorus Reduction Planning

A detailed assessment of causes for phosphorus from a variety of land use settings including industrial, commercial, and municipal. The assessment would also determine the best opportunities for phosphorus reduction including training and education and limiting or changing certain processes in industrial settings.

Biological

Chemical Treatment

This is one main treatment of phosphorus and other nutrients. Traditionally, this includes aluminum, iron, and calcium-based chemicals to function as binding agents for dissolved phosphorus. Treatment can happen at the headworks, aeration, filters, and sludge dewatering.

Filtration

Upgrade facilities with new high rate upflow filtration devices utilizing compressible, synthetic fiber spheres as the medium. This can assist the operators in achieving lower P values in effluent. The size of the filtration is dependent on the facility. Fuzzy and Disc Filters) can also be utilized.

4.1.2 Non-Point Sources

With large amounts of phosphorus originating from nonpoint sources, management measures will include agricultural and urban considerations. Since large landowners and agricultural operations are generally outside city jurisdictions, there is little restriction on management. However, landowners have traditionally taken advantage of USDA programs such as the Wetland Reserve program and various initiatives of Environmental Quality Incentives Program (EQIP). Partnerships will need to be developed to implement large-scale implementation in the Saline River watershed. This includes critical areas in subwatersheds where high phosphorus and other nutrient loads are present. The figure on the following page represents the critical watersheds in the Saline River basin. While this list is not exhaustive, it includes some major measures to mitigate phosphorus through source and transport.

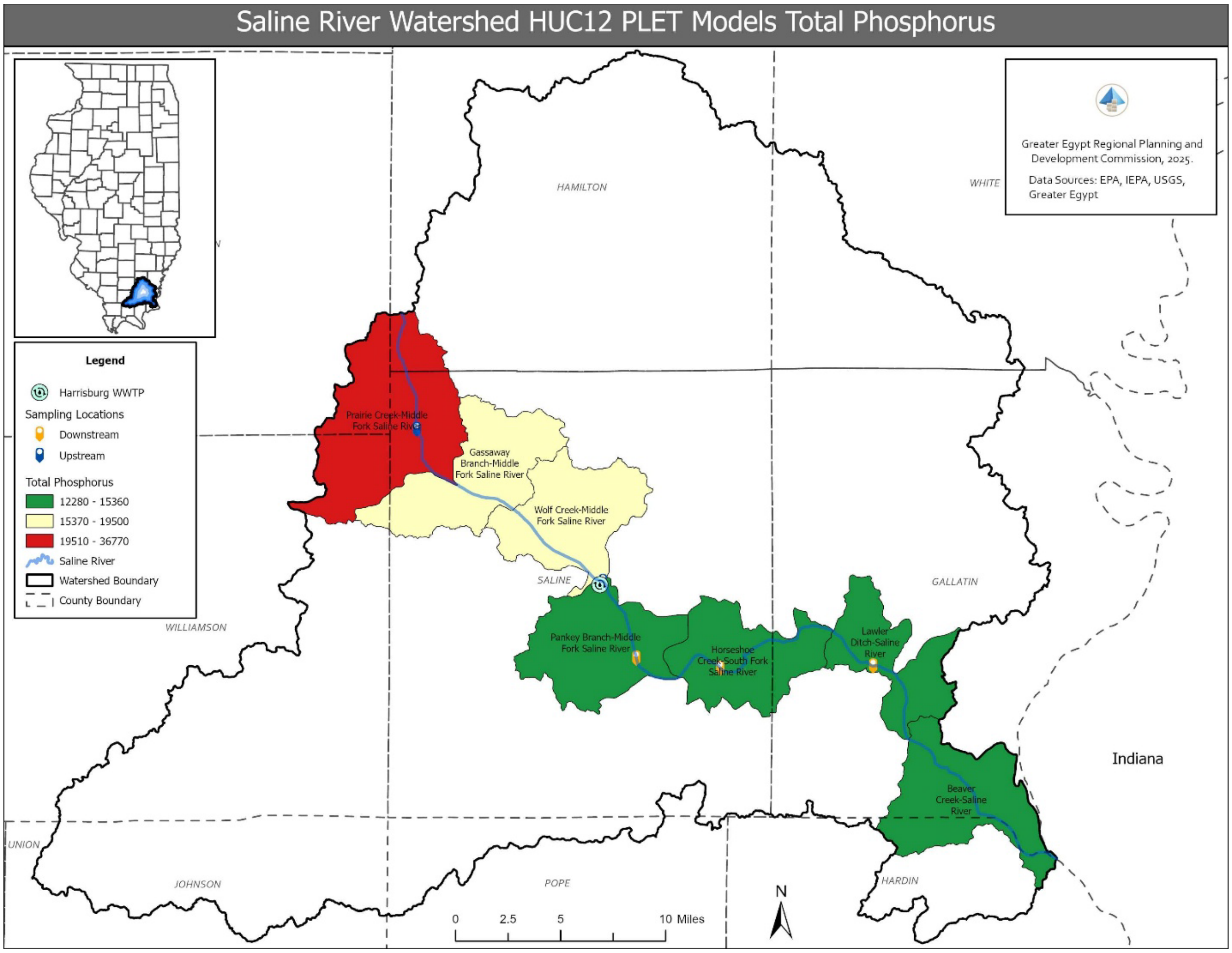
Agricultural Runoff Measures

Agricultural Filter Strips

Agricultural filter strips protect water quality by naturally filtering nutrients and sediment. With the amount of agricultural runoff taking place within the watershed, agricultural filter strips are particularly effective in reducing pollutant loads.

Conservation Tillage

Conversation tillage can include mulch-till, no-till, and strip-till practices. These forms of conservation tillage usually leave a residual of the previous layer of crops. Each method varies in practice, but the benefits are typically consistent with the others. Any form of conservation tillage paired with contour farming brings added benefit. Major benefits of implementing some form of conservation tillage include reduction in soil erosion and improved water quality. This management practice is a low to moderate cost to place within the area of interest.



Cover Crops

Cover crops provide benefits to agricultural land by improving water quality and reducing erosion. These are usually planted following seasonal harvests. Cover crops serve to protect soil surface from raindrop impact, improve infiltration relative to bare soil, and trap eroded particles. Cover crops are typically small grains, specifically planted to provide soil cover during the winter. This practice is tailored to the specific crop benefits and/or soil concerns of the farmer. Cover crops control erosion by protecting the soil from wind and water. They can also be used for excess nutrient uptake, increased soil nutrients and organic matter, and weed suppression.

Critical Area Planting

Critical Area Planting involves establishing permanent vegetation on land that is currently eroded or expected to erode soon. Usually, these are places that are highly eroded and are unable to be farmed. This practice is mostly used on steep slopes and areas of bare ground, especially along streams, channels, and shorelines. The benefit of this practice is to increase soil cover and reduce erosion from wind or rain. Areas where this BMP may apply include active or abandoned mined lands, areas needing stabilization before or after natural disasters such as floods, hurricanes, tornados, and wildfires, eroded banks of natural channels, banks of newly constructed channels, and lake shorelines. Establishing permanent cover helps to stabilize the soil structure, therefore reducing runoff and improving water quality.

Crop Rotation

Crop rotation involves cycling two or more crops on the same ground over a period of time. The changing sequence of crops between years allows for increased soil health, as well as reducing sheet, rill and wind erosion. Rotating another crop into the cycle with a larger rooting depth will support further intake of excess nutrients the previous crop could not reach. The outcome is enhanced water quality due to nutrients being used for their intended purpose of crop production instead of running off into nearby waterways. Using cover crops during fallow seasons provides additional nutrient retention. Crop rotation can be combined with many other conservation efforts for enhanced benefits to land and streams.

Drainage Water Management

Drainage water management (DWM) is a practice used in conjunction with existing tile drained fields on flatter landscapes. A water control structure is installed which allows for control of water level by draining excess water or retaining it for future use. This allows for seasonal variation of the crops water needs. By retaining water for future use, crops are given the opportunity to capture water and nutrients for their benefit; thus, decreasing direct flow of nutrients into surrounding waterbodies. This aids in crop production, as well as improved water quality. DWM is most effective on flat uniform fields that already have tile drainage systems in place.

Grassed Waterways

Grassed waterways prevent erosion in areas prone to consistent water flow. They can also serve as a filtering mechanism for nutrients. Implementation of grassed waterways is assuming at least a 60-foot width per gully.

Livestock Crossings

Livestock frequently crossing through a stream can cause erosion to the streambank and impair the water via increased sedimentation and nutrient loading. Livestock crossings can be constructed by varies means, but with the purpose in mind to stabilize the stream. In many cases, farmers will fence off a portion of the stream to help minimize disturbance.

Pasture/ Hay Planting

A pasture is an area planted with grass or legumes to provide forage for livestock. As a best management practice, specific species are selected to improve forage production, enhance livestock nutrition, and protect the soil from erosion. Converting cropland into pasture or hay production not only benefits local wildlife but improves water quality as well. The hay/pasture fields filter out nutrients and sediment before entering the stream.

Riparian Buffers

A riparian buffer is land following along streams, lakes, and wetlands that is managed for perennial vegetation (grass, shrubs, and/or trees) to improve and guard aquatic resources from the hostile impacts of agricultural practices. Riparian buffers are similar to filter strips and have additional benefits. Like filter strips, buffers reduce sediment and nutrients by filtering the water that flows through it. Since buffers are generally larger than agricultural filters, they can reduce the flow of water at a higher pace. Since implementation of buffers are more expensive than normal filter strips, they were suggested sparingly.

Water & Sediment Control Basins

Water and Sediment Control Basins (WASCOB) function quite like terraces but are more geared towards irregular topography where farmers cannot easily plow on the contours. An earth embankment is constructed perpendicular to a gently sloped waterway to trap runoff. The sediment is allowed to settle within the basin, while the remaining runoff slowly releases into a stable outlet. The WASCOB prevents rill erosion and increased sedimentation in waterways by slowing down runoff, especially after heavy rain.

Urban Stormwater Management Measures

Municipalities in the plan can promote stormwater management practices to reduce phosphorus. Stormwater management planning is encouraged and may involve incentives to residents implementing low impact development projects.

Raingardens/Bioswales

Raingardens and Bioswales hold or slow down excess stormwater, relieving stress on sewer systems. They also act as a filter for stormwater pollutants. Swales are effective in trapping sediment and other nutrients before releasing the water flow into other areas. Depending on the contributing area for the practice, bioswales are generally a suitable structure to reduce total suspended solids.

Street Sweeping

Municipalities can adopt a street sweeping schedule to remove sources of phosphorus-rich debris like leaf matter. This reduces the amount of P entering surface water from stormwater drainage. This can also prevent clogging of stormwater infrastructure and waterbodies.

Urban Trees

Urban trees can reduce stormwater flow, lower risk of flash floods, and improve water quality by filtering pollutants. Urban trees also reduce the Urban Heat Island effect, improve air quality, reduce energy usage of nearby buildings, provide wildlife habitat, and improve city aesthetics.

Rain Barrels/ Cisterns

Rain barrels are containers which capture the rain flowing off your roof through a downspout. It is safe to use for watering gardens, lawns, and trees, and for washing cars or outdoor areas. Rain barrels with a drainage valve can be used to store water for use between rain events. When the valve is opened, the water can empty from the barrel slowly, thus reducing the amount of runoff and increasing infiltration during storm events.

4.2 Technical and Financial Assistance

Each management measure in the plan has also been described by the technical and financial assistance needed to implement each measure. While technical assistance comes from a few select groups, the financial assistance for management measures comes from a variety of different sources. It is important to note that most measures will need to be configured to the specific location and needs of the agency overseeing the implementation. Detailed costs will be determined from stakeholders, contractors, engineers, and materials suppliers and are outside the scope of this Plan. Technical and Financial Assistance is further detailed in the corresponding graph labeled Table 4.1.

4.2.1 Technical Assistance

The labor to execute the management measures will largely come from local municipalities, public works, and contractors. State and federal agencies such as the Il EPA, US EPA, USDA/NRCS and the Jackson, Williamson County Soil and Water Conservation Districts will also be utilized.

The type of technical assistance largely depends on which type of BMP is being implemented. For agricultural BMPs, the USDA and Soil and Conservation Districts will be able to provide their services. If the BMP is municipal, local public works can offer their support. However, for most management measures, drawings and surveys will likely be required by an engineer.

4.2.2 Financial Assistance

Most of the management measures described in the plan will require funding. The major source of funding will be through the US EPA and Illinois EPA by State Loans, Clean Water Act Section 319 Grant Program, and other major funding sources.

Point Source Management Measures

A municipality pursuing wastewater system improvements typically draws on a combination of state and federal grant and loan programs, as well as local revenue strategies, to fund planning, design, and construction. The Illinois State Revolving Fund (SRF) is often a primary source, providing low-interest loans, and in some cases principal forgiveness, to finance major treatment plant upgrades, collection system rehabilitation, nutrient removal improvements, and other eligible infrastructure. Municipalities commonly use the SRF to fund costly capital components because it offers long repayment terms and predictable financing.

For smaller or rural communities, the USDA Rural Development Water and Waste Disposal Loan and Grant Program can cover needs that exceed local financial capacity. This program combines grants with long-term, low-interest loans to support the construction, expansion, or replacement of wastewater systems, making it especially beneficial for communities with limited user bases or lower median household incomes. Municipalities may pursue USDA funding when SRF financing alone would create an excessive rate burden.

The Illinois Department of Commerce and Economic Opportunity (DCEO) Community Development Block Grant (CDBG) program offers another key resource, providing grant funds for wastewater system improvements in low- to moderate-income communities. These funds are often used to reduce the total project cost, improve affordability, or support critical components such as main replacements, lift station improvements, or rehabilitation required to address public health or compliance issues.

For unsewered areas facing failing onsite systems, the Illinois EPA Unsewered Communities Grant provides grant funding for planning and constructing first-time wastewater collection and treatment systems. Municipalities may use this program to extend sewer service to underserved areas, complete design studies, or build decentralized or centralized systems that eliminate environmental health risks.

Municipalities typically supplement external funding with an increase in municipal utility rates to ensure long-term financial sustainability. Rate adjustments are often required to meet SRF loan repayment obligations, cover ongoing operation and maintenance, and build adequate reserves. By combining state and federal assistance with locally supported rate structures, municipalities can implement comprehensive wastewater upgrades while maintaining regulatory compliance and ensuring long-term reliability.

Nonpoint Source Management Measures

While 319 funding covers many nonpoint management measures in the plan, other funding sources must be considered for the remaining measures. The USDA Natural Resource Conservation Service offers many funding and easement opportunities through programs such as: Agriculture Management Assistance (AMA), Conservation Stewardship Program (CSP), Environmental Quality Incentives Program (EQIP), and Agricultural Conservation Easement Program (ACEP).

Through the USDA Farm Service Agency (FSA), funding is offered through programs such as: Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), and Farmable Wetlands Program (FWP). Emergency Conservation and Emergency Forest Restoration Programs offer funding and technical assistance, also through USDA FSA, to restore lands that have been damaged by natural disasters.

The Illinois Department of Agriculture offers funding such as: Conservation Practices Program (CPP), Well Decommissioning Program (WDP), Streambank Stabilization and Restoration (SSRP), Nutrient Management Program (NMP), Soil and Water Conservation District Grants Program, and Vegetative Filter Strip Assessment Law. Another funding source aimed particularly at reducing soil loss and protecting water quality is offered through the Bureau of Land and Water Resources through the Partners for Conservation Program.

Other grants offered through the Illinois Department of Natural Resources include Open Space Lands Acquisition & Development and Land & Water Conservation Programs, Park and Recreational Facility Construction Grant Program, and Federal Recreational Trails.

Illinois EPA provides multiple funding opportunities to finance the design and construction of both, wastewater and nonpoint source pollution projects through grants and low-interest loan programs that include Illinois Green Infrastructure Grant Program for Stormwater Management (IGIG), Nonpoint source Grants, and Wastewater/Stormwater and Drinking Water Loans.

In most cases, these programs will not cover the entire cost of the selected BMPs. The remaining costs would have to be funded by landowners, municipalities, businesses, and other entities. In cases where there are no grants or funding assistance for components such as chemical treatment, utility rates would need to be raised, causing concerns for municipalities that are already under financial stress.

Table 4.1

		Management Measures	Technical Assistance	Financial Assistance	Note	Source:
Point Source	WWTP Operations	**Chemical Treatment**	Provided by operators and plant staff	•Illinois State Revolving Fund	Level of chemicals dependent on 0.5 and 0.1mg/L Limitations	
		Filtration	Provided by operators and plant staff	•USDA Rural Development Water and Waste Disposal Loan and Grant	Level of chemicals dependent on 0.5 and 0.1mg/L Limitations	
		Flocculation Basin	Consultant, Construction Team	•Illinois DCEO Community Development Block Grant	For strictest limitations	Local Planning
		Phosphorus Reduction Planning	Plant Staff, City Staff, Planning Commission, Public	•Illinois EPA Unsewered Communities Grant	Continued involvement in watershed-wide planning	NARP Planning
		Sludge Dewatering System	Consultant, Construction Team	•Increase Municipal Utility Rates	For strictest limitations	
Nonpoint Source	Agricultural	**Agricultural Filter Strip**	Farm Bureau, Landowner, NRCS, SWCD	IEPA 319, NRCS, USDA		
		Conservation Tilage	Farm Bureau, Landowner, NRCS, SWCD	NRCS, USDA		
		Cover Crops	Farm Bureau, Landowner, NRCS, SWCD	IEPA 319, NRCS, USDA		
		Critical Area Planting	NRCS, USDA	IEPA 319, NRCS, USDA		
		Crop Rotation	Landowner	NRCS, USDA		
		Drainage Water Management	Farm Bureau, NRCS, USDA	NRCS, USDA		
		Grassed Waterways	NRCS, USDA	IEPA 319, NRCS, USDA		
		Livestock Crossings	NRCS, USDA	IEPA 319, NRCS, USDA		
		Pasture/Hay Planting	Farm Bureau, Landowner, NRCS, SWCD	NRCS, USDA		
		Riparian Buffers	Farm Bureau, Landowner, NRCS, SWCD	IEPA 319, NRCS, USDA		
		WASCOBS	Farm Bureau, Landowner, NRCS, SWCD	IEPA 319, NRCS, USDA		
	Urban	**Raingarden/Bioswale**	Landowner, NRCS, SWCD	IEPA 319, NRCS, USDA		
		Street Sweeping	Municipality	Municipal Funding	Potential funding for components from GIGO, or similar	
		Urban Tree Planting	Municipality, Landowner, SWCD	IEPA 319, NRCS, USDA		
		Rain Barrels/ Cisterns	Landowner, NRCS, USDA	IEPA 319, NRCS, USDA		

4.3 Implementation Schedule

The implementation schedule reflects the general goals in the Saline River Watershed NARP. These components can be seen in the following implementation schedule.
Phase I signifies the short-term actions to be taken in the first two years of the plan. This includes continuing NARP planning functions which would serve to implement the plan and track progress.

Phase II constitutes the mid-term implementation of the plan. While current IEPA guidance is 1.0 mg/L, future guidance may be more stringent at 0.5 mg/L. Components in this phase should be completed within the sixth year of plan implementation.

Key elements of this phase include the continuation submitting grant applications for BMPs for phosphorus removal for nonpoint sources suggested in the plan. The implementation and execution of BMPs will also occur under this segment of the plan.

Phase III indicates the final stage of the plan. This is characterized by continuing efforts in BMP implementation and evaluating accomplishments throughout the plan. If Illinois EPA standards are set even lower at 0.1 mg/L, further management measures will need to be introduced including the mechanical components of the point source management section.

Implementation Schedule

Target	Phase I		Phase II				Phase III			
	1.0 mg/L		0.5 mg/L				0.5 - 0.1 mg/L			
	1	2	3	4	5	6	7	8	9	10
Coordinate Annual NARP Meeting/Update										
Outreach to Nonpoint Source - Ag										
Outreach to Nonpoint Source - Urban										
Nonpoint Source Measures										
Point Source Measures										
Point Source Measures +										

4.4 Evaluation and Monitoring

Along with the implementation schedule, water quality benchmarks and a monitoring component are presented to evaluate the implementation and the overall success of the NARP and phosphorus reduction actions. Evaluation criteria are based on current phosphorus standards set by Illinois EPA (1.0 Mo Avg) while the monitoring component is based on available water quality data.

The Saline River NARP Planning Committee will meet annually to discuss plan implementation, progress, and evaluation. If needed, the NARP can be amended and resubmitted to IEPA.

4.4.1 Evaluation Criteria

The benchmarks provided in Table 4.2 are based on the implementation of management measures in the plan and continued best management practices. Determining success and achieving these benchmarks will be dependent on the number of measures that are being implemented in the planning period. Goals are taken from various sources including IL NLRS, NPDES requirements and current guidance. While the current standards indicate a phosphorus monthly average of 1.0 mg/L, future guidance may suggest a lower limit of 0.5, or even 0.1.

Table 4.2 Benchmarks for Determining Plan Progress

	Benchmark Reduction Targets				
Benchmark Period	**P IL NLRS Watershed-wide**	**P NARP**	**Mo AVG P NPDES**	**12-MO MEAN TP**	
2 Year (Phase I)	15	5	1.0	0.5	Chemical P
5 Year (Phase II)	15	10	1.0	0.5	Bio P
10 Year (Phase III)	45	15-45	1.0	0.5	EXT Mod (P+N)

4.4.2 Monitoring Component

A monitoring component is essential to determine progress in achieving water quality. Several elements represent the monitoring component for the plan. These items will provide water quality data that can be used to assess the efficacy of the Saline River Watershed NARP. The monitoring strategy components are as follows:

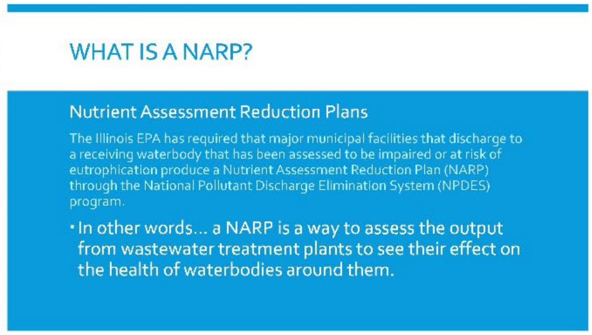
1. **NPDES Permitee Requirements** – The plant and operators will continue to sample according to their NDPES Permit. This requires water quality adherence to certain standards. Average monthly phosphorus limits in NPDES Permits are currently 1.0 mg/L. Samples can be examined for indicators of eutrophication.
2. **NARP Sampling** – Although the sampling plan of the NARP ended in October 2025, WWTP Operators in the plan are encouraged to continue taking pH, chlorophyll and dissolved oxygen readings along the additional NARP sampling points.
3. **Ambient Water Quality Monitoring Network (AWQMN)** - XX fixed stations are set up along streams throughout Illinois to routinely collect water quality data. Water samples are collected in 6-week intervals and are analyzed for a variety of parameters, including temperature and dissolved oxygen. Since the planning area experiences various impairments including phosphorus and dissolved oxygen, the AWQMN would be an important component in monitoring the progress of water quality in the watershed.
4. **Dissolved Oxygen Monitoring** – Measuring dissolved oxygen can be a good indicator for other water quality impairments including eutrophication. Maintaining a healthy aquatic environment is also key for the river's recreational uses. Dissolved oxygen measurements would likely be taken from operators or IEPA sampling.
5. **Intensive River Basin Surveys** - Every five years IEPA and IDNR conduct intensive basin surveys of various watersheds in Illinois. IDNR completes testing of aquatic species while the IEPA monitors instream habitats and water quality.

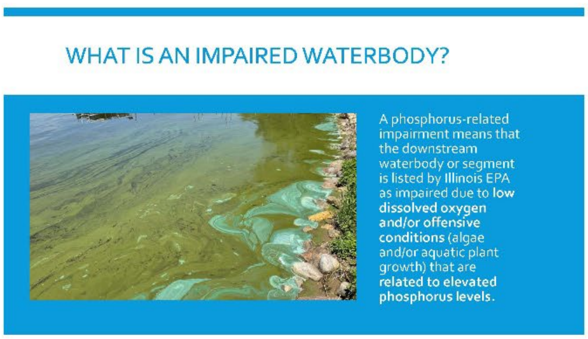
4.5 Meeting IEPA Requirements

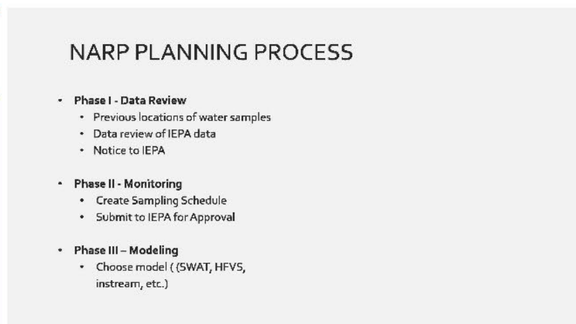
Through the NARP Planning Process, the Saline River Watershed Planning Committee has met each of the eight requirements outlined in the NPDES of the participating municipalities. While some of these requirements were more easily obtainable, others will continue to follow the process reported in this plan to achieve the goal.

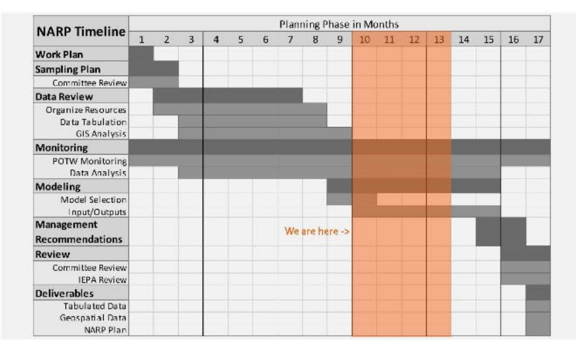
IEPA NARP REQUIREMENT	SALINE RIVER WATERSHED ACTIVITY	
A. The NARP shall be developed and submitted to the Agency by December 31, 2025. This requirement can be accomplished by the Permittee, by participating in an existing watershed group or by creating a new group. The NARP shall be supported by data and sound scientific rationale.	***The Saline River Watershed NARP Plannning Committee was formed in the summer of 2023.***	***The Saline River Watershed NARP was forwarded to IEPA on December 30, 2025. The NARP uses existing and sampled water quality data for mapping and modeling purposes.***
B. The Permittee shall cooperate with and work with other stakeholders in the watershed to determine the most cost-effective means to address the risk of eutrophication. If other stakeholders in the watershed will not cooperate in developing the NARP, the Permittee shall develop its own NARP for submittal to the Agency to comply with this condition.	***The Saline River Watershed Planning Committee collectively invested in NARP funding since grants were not awarded for this type of planning.***	***Management measures to mitigate eutrophication can be found in the BMP section of this report.***
C. In determining the target levels of various parameters necessary to address the risk of eutrophication, the NARP shall either utilize the recommendations by the Nutrient Science Advisory Committee or develop its own watershed-specific target levels.	***Watershed-wide specific targets will follow goals set in thh IL NLRS. This accounts for 45% reduction in P and N.***	***While some goals will be achieved on site, most goals are non-point source based.***
D. The NARP shall identify phosphorus input reductions from point sources and non-point sources in addition to other measures necessary to remove the risk of eutrophication characteristics that will cause or may cause violation of a water quality standard. The NARP may determine, based on an assessment of relevant data, that the watershed does not have a risk of eutrophication related to phosphorus, in which case phosphorus input reductions or other measures would not be necessary. Alternatively, the NARP could determine that phosphorus input reductions from point sources are not necessary, or that phosphorus input reductions from both point and nonpoint sources are necessary, or that phosphorus input reductions are not necessary and that other measures, besides phosphorus input reductions, are necessary.	***The NARP determined non-point sources to be a major factor in p sources in the Saline River watershed.***	***Samples taken during the sampling plan indicated p levels to be inconsistent during dry levels.***
E. The NARP shall include a schedule for the implementation of the phosphorus input reductions and other measures. The NARP schedule shall be implemented as soon as possible and shall identify specific timelines applicable to the permittee.	***The timeline for implementation and monitoring strategy is included in the plan.***	***P Input reduction methods will be focused on measures outlined in each operator's Phosphorus Optimization Plan and further measures outlined in this plan.***
F. The NARP can include provisions for water quality trading to address the phosphorus related risk of eutrophication characteristics in the watershed. Phosphorus/Nutrient trading cannot result in violations of water quality standards or applicable antidegradation requirements.	***The Saline River watershed NARP does not contain provisions for water qualiyt/ nutrient trading.***	***If needed, the Planning Committee can amend the NARP to include water quality/ nutrient trading.***
G. The Permittee shall request modification of the permit within 90 days after the NARP has been completed to include necessary phosphorus input reductions identified within the NARP. The Agency will modify the permit if necessary.	***If needed, the Saline River watershed Planning Committee will request modification of the plan within 90 days of submission.***	
H. If the Permittee does not develop or assist in developing the NARP and such a NARP is developed for the watershed, the Permittee will become subject to effluent limitations necessary to address the risk of eutrophication. The Agency shall calculate these effluent limits by using the NARP and any applicable data. If no NARP has been developed, the effluent limits shall be determined for the Permittee on a case-by-case basis, so as to ensure that the Permittee's discharge will not cause or contribute to violations of the dissolved oxygen or narrative offensive condition water quality standards.	***All Permittees within the Saline River watershed with a NARP requirement in their NPDES Permit participated in the planning process from 2023-2026.***	***Effluent limits are outlined in the NARP.***

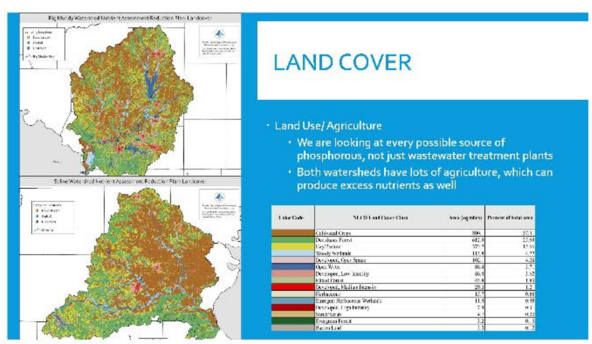
APPENDIX A – PUBLIC PARTICIPATION









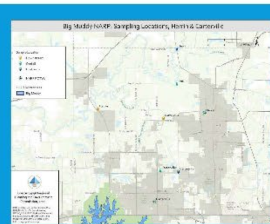


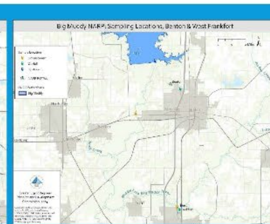
SAMPLING PLAN

- 2025 Sampling Season is still ongoing
- Chlorophyll (CHL-A) collection
  - Begins in April
  - Samples sent to Pace Analytics
    - Greater Egypt can assist if needed
- Results sent in as they are collected
- Model/Maps made based on submissions

https://greateregypt.maps.arcgis.com/apps/mapviewer/index.html?webmap=fb59fd4c11f44b0cbac13fe3cac2ca6e

SAMPLING LOCATIONS





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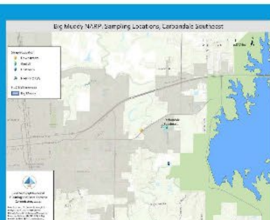
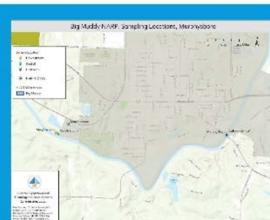
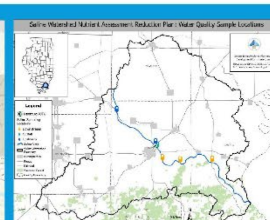


SAMPLING LOCATIONS





AFFP
The Greater Egypt Regional Pla

Affidavit of Publication

STATE OF IL }
COUNTY OF JACKSON } SS

Johnny Blazina, being duly sworn, says:

That he is Sales Manager of the The Southern Illinoisan, a daily newspaper of general circulation, printed and published in Carbondale, Jackson County, IL; that the publication, a copy of which is attached hereto, was published in the said newspaper on the following dates:

September 13, 2025

The Greater Egypt Regional Planning and Development Commission will be hosting an informational meeting
regarding the Nutrient
Assessment Reduction Plans (NARP) for the Big Muddy and Saline River watersheds. The meeting will be held on September 18, 2025, from 10:00 AM to 11:00 AM at the Greater Egypt Office – 3117 Civic Circle Blvd-Suite A, Marion, IL.

Attendees will learn more about the planning process for the NARPs; an Illinois EPA requirement for some
municipalities in which their wastewater facility is upstream of a waterbody with a phosphorus impairment.

For more information, please visit greateregypt.org/narp, or call the Environmental Planning Department at Greater Egypt at 618-997-9351.

That said newspaper was regularly issued and circulated on those dates.
SIGNED:

Sales Manager

Subscribed to and sworn to me this 13th day of September 2025.

Shellie Lea Koontz, Notary Public, Jackson County, IL

My commission expires: February 06, 2029

SHELLIE LEA KOONTZ
NOTARY
ID # KYNP96683
My Commission Expires
FEBRUARY 6, 2029
PUBLIC
STATE AT LARGE, KENTUCKY

70128273 71311775

Margie Mithell
Greater Egypt Regional Planning and Development Co
3117 Civic Circle Blvd, Suite A
Marion, IL 62959

NARP Survey for Agricultural Agencies - Big Muddy Watershed

This survey is intended to gather opinions from agricultural professionals on the status of the Big Muddy River Watershed. Responses will be summarized and published in the Big Muddy Nutrient Assessment Reduction Plan

tylercarpenter@greateregypt.org Switch account

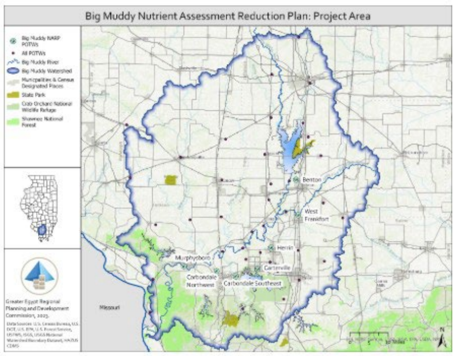
The name, email, and photo associated with your Google account will be recorded when you upload files and submit this form

* Indicates required question

Email *

☐ Record tylercarpenter@greateregypt.org as the email to be included with my response

Project Area Map



What is your name?

What are the biggest challenges you face in implementing agricultural BMPs for water quality? Check all that apply

- ☐ Difficult to contact farmers/landowners
- ☐ Difficult to retain farmers/landowners in long term programs or relationships with my agency
- ☐ Lack of incentives for landowners/farmers to implement BMPs
- ☐ Lack of funding for programs
- ☐ Lack of staff to implement programs
- ☐ Lack of legislation and enforcement capabilities
- ☐ Other

If you selected other, please explain below:

Your answer

If you have any records or report summaries regarding agricultural BMPs in this watershed that you are able to share, please do so here, or submit to planning@greateregypt.org

Upload up to 5 supported files: PDF, document, or spreadsheet. Max 100 MB per file.

Add file

What is your job title?

Your answer

What agency do you represent?

Your answer

How do you perceive the overall water quality of the Big Muddy River watershed?

- ◯ Poor
- ◯ Fair
- ◯ Good
- ◯ Excellent

Please rank the following issues in terms of how much they contribute to water quality issues in the Big Muddy River Watershed

	1 (not contributing at all)	2	3	4	5 (contributing the most)
Point source pollution: wastewater treatment plants	◯	◯	◯	◯	◯
Point source pollution: mining/industry/other	◯	◯	◯	◯	◯
Non-point source pollution: agricultural nutrient runoff	◯	◯	◯	◯	◯
Non-point source pollution: agricultural chemical runoff (i.e. pesticides/herbicide	◯	◯	◯	◯	◯
Non-point source pollution: agricultural sediment runoff/soil loss	◯	◯	◯	◯	◯
Non-point source pollution: urban sources (lawns, golf courses, other)	◯	◯	◯	◯	◯
Channel erosion and sedimentation	◯	◯	◯	◯	◯
Channelization	◯	◯	◯	◯	◯
Development	◯	◯	◯	◯	◯
Climate Change	◯	◯	◯	◯	◯

Are there other issues contributing to water quality issues in the Big Muddy River

What BMPs does your agency implement, or assist landowners in implementing? Check all that apply

- ☐ Filter strips
- ☐ Grassed waterways
- ☐ Riparian buffers
- ☐ Wetland creation/restorations
- ☐ No-till, strip-till, mulch-till practices
- ☐ Cover crops
- ☐ Critical area planting
- ☐ Crop rotation
- ☐ Terraced fields
- ☐ Water and sediment control basins (WASCOBs)
- ☐ Water control structures
- ☐ Livestock stream crossings
- ☐ Gully stabilization
- ☐ Streambank stabilization
- ☐ Conservation easements
- ☐ Habitat restoration
- ☐ Other:

Please list the funding sources or program names that BMPs are implemented through:

Your answer

Do you keep records of BMP implementation within your jurisdiction?

- ◯ yes
- ◯ no

Do you conduct any monitoring post implementation such as water/soil testing?

- ◯ yes
- ◯ no

APPEDNIX B

SALINE RIVER WATERSHED

NUTRIENT ASSESSMENT REDUCTION PLAN (NARP)

SAMPLING PLAN

GREATER EGYPT REGIONAL

PLANNING & DEVELOPMENT COMMISSION

1) Plan History and Partners

The Illinois Environmental Protection Agency (IEPA) is requiring certain municipal permittees to develop or be a part of a watershed group that develops a Nutrient Assessment Reduction Plan. This is in response to the Agency determining that the operator's treatment plant is upstream of a waterbody or stream segment that is at risk of eutrophication due to phosphorus levels in the waterbody.

One municipality in the Saline River watershed has this requirement City of Benton

- City of Harrisburg

Beginning in 2023, the municipality formed the Saline River NARP Advisory Group (Group) to fulfill the requirements of the Agency. The Group has consulted with the Greater Egypt Regional Planning and Development Commission to coordinate the NARP efforts to fulfill all requirements of the IEPA.

Through meetings and various discussions with IEPA, the Group determined that the first action would be to create the sampling plan to be reviewed by IEPA.

2) Planning Process

Initial planning has consisted of determining primary actions. These include:

1. **Establish Watershed/NARP Group**
   a. Fulfills requirements A and B in the NPDES Permits of operators established by IEPA

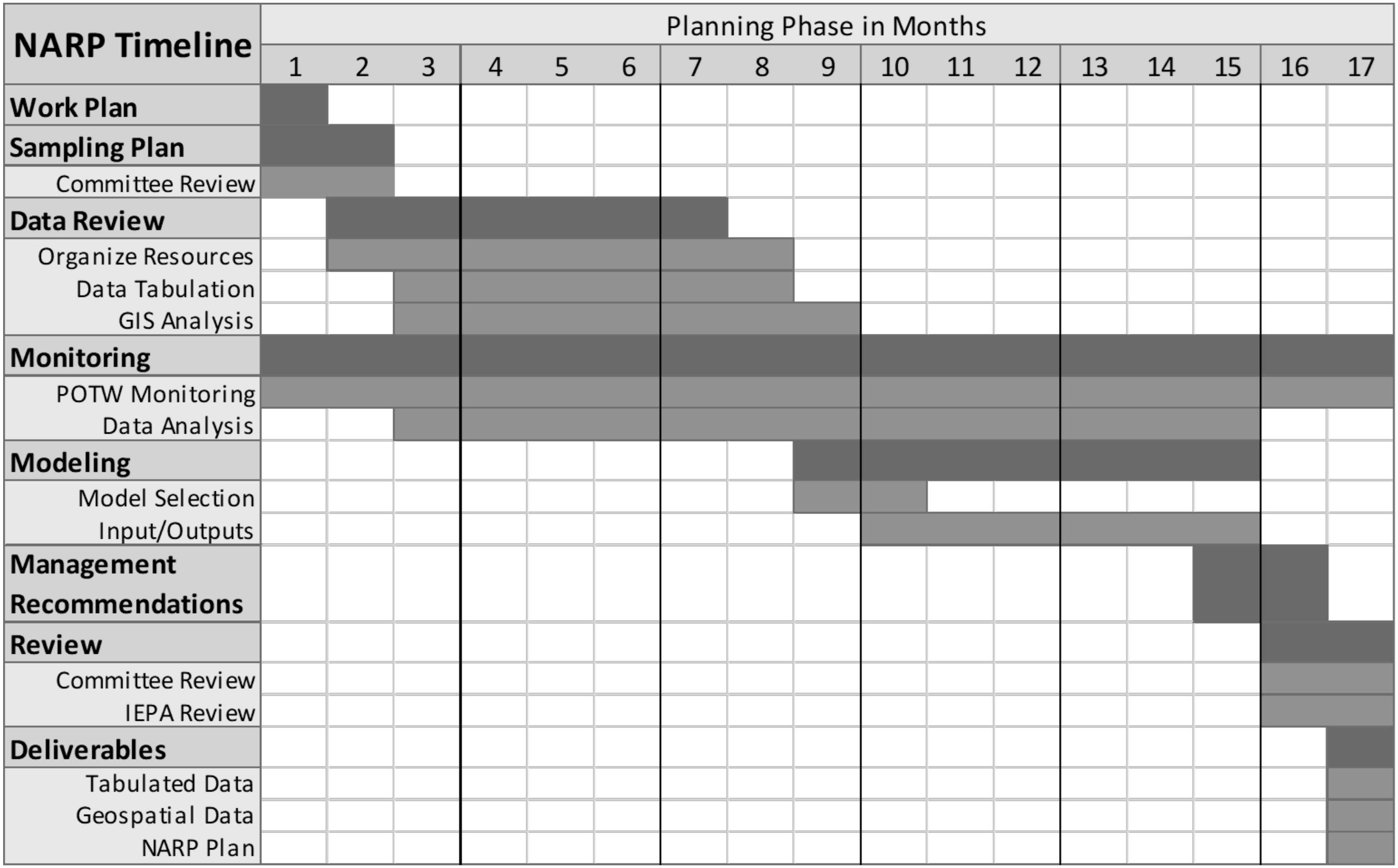
2. **Develop NARP Objectives**
   a. Develop Work Plan
      i. Includes organizing partners and groundwork for NARP objectives
   b. Create Sampling Plan
      i. Coordinated effort by all partners
      ii. Outlined later in this report
   c. Data Review
      i. Organize resources of existing data
      ii. Data tabulation
      iii. Initial GIS and mapping components
   d. Monitoring
      i. Execution of sampling plan
      ii. Data analysis following data completion
   e. Modeling
      i. Hydrologic and/or Hydraulic models will be chosen in the planning process
      ii. SWAT, HFVS, HEC-RAS, HEC-HMS or similar modeling software
   f. Input Reductions and Management Recommendations
      i. Measures can include best management practices to limit phosphorus and other nutrients to mitigate risk of eutrophication
   g. Review
      i. Reviews will be made by the Group, IEPA, and other interested parties
   h. Deliverables

i. The NARP will be delivered to IEPA by December 31, 2025.

See attached NARP Objectives Timeline on next page. These objectives will fulfill requirements C and D.

3. Establish Schedule

a. Schedule will be made for phosphorus input reductions recommended in the plan fulfilling requirement E.

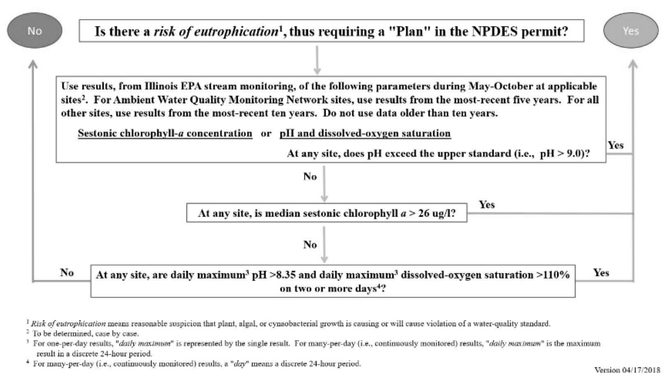

NARP Timeline
Planning Phase in Months
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Work Plan
Sampling Plan
Committee Review
Data Review
Organize Resources
Data Tabulation
GIS Analysis
Monitoring
POTW Monitoring
Data Analysis
Modeling
Model Selection
Input/Outputs
Management Recommendations
Review
Committee Review
IEPA Review
Deliverables
Tabulated Data
Geospatial Data
NARP Plan

3) Sampling Plan

The sampling plan is a coordinated effort between Group partners in the Saline River watershed. While this is a massive undertaking for a watershed this size, a schedule will be followed with certain water quality features to be analyzed. These include features in the NPDES permit.

Water Quality Measurements

- ***$CBOD_5$***
- ***Chlorine Residual***
- ***Chlorophyll-A (CHL-A)***
  - The chlorophyll samples will be taken along with the other identified measures
  - Since this is a separate analysis, each CHL-A sample costs around $75.00 beyond the normal analytics fees
  - Taken April- October



- ***Dissolved Oxygen (D.O)***
  - CHL-A or pH and dissolved oxygen are used to determine if a risk of eutrophication in the receiving waterbody is present
  - Dissolved oxygen meters may be utilized from local sources in the case the permittee does not have access to a unit. Calibration can be handled in-house.
- ***Fecal Coliform***

- ***Total Nitrogen (N)***
    - *Total Kjeldahl Nitrogen*
    - *Nitrates*
    - *N as Ammonia*
- ***pH***
- ***Total Phosphorus (P)***
- ***Suspended Solids***
- ***Temperature***
- ***Visual Report***
    - This will feature observational data which can include odor, turbidity, erosion, etc.

Lab Analysis and QA/QC

Harrisburg currently utilizes Pace Analytical for water quality analysis. To ensure accurate data quality, CHL-A samples will also be analyzed by Pace Analytical. Results will be utilized during the modeling phase of the NARP.

Date and Time

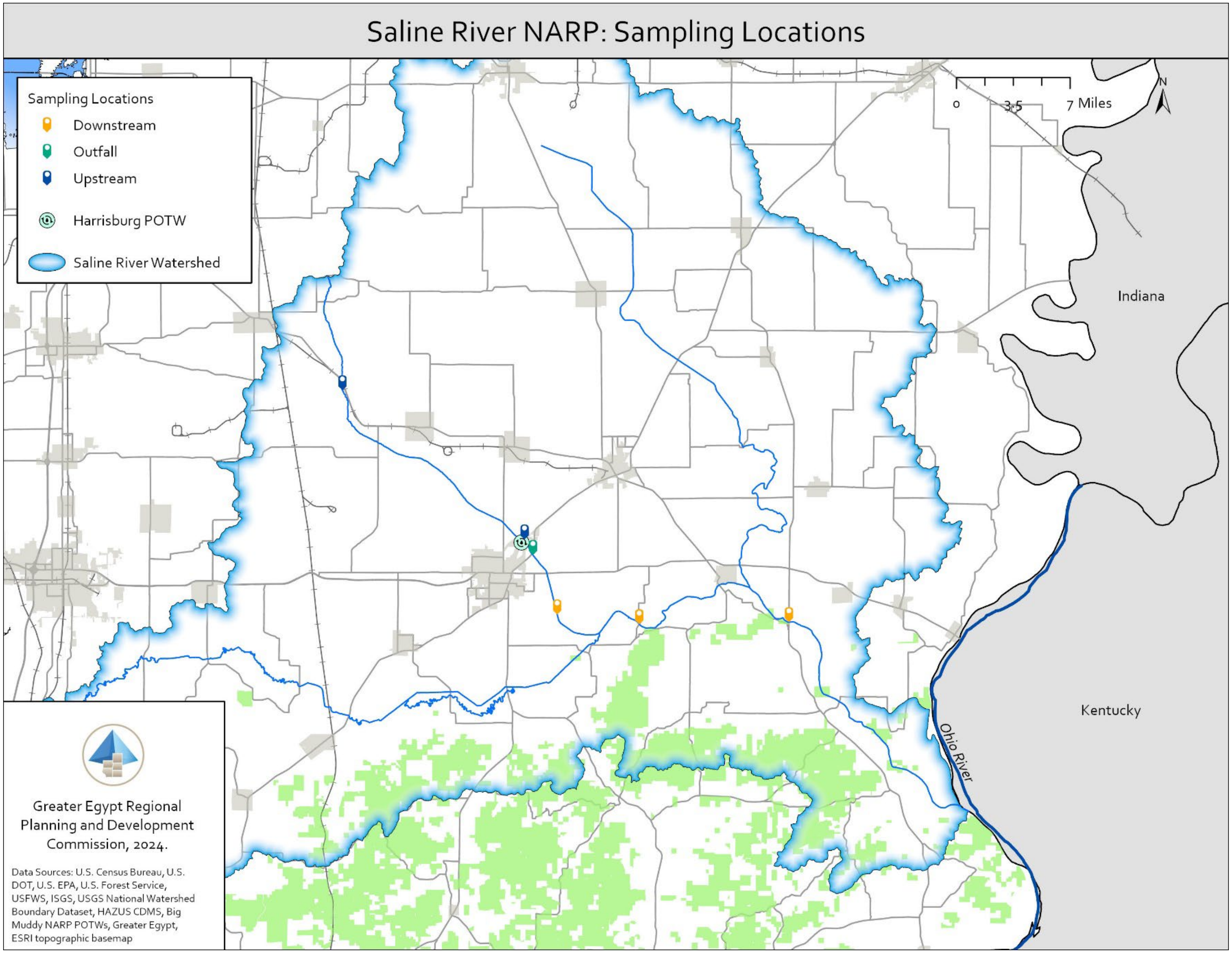
Samples will be taken on the first and third Tuesday of each month at 10:00 AM. If a Group member cannot comply with this time and date, they will take it as close as possible to the set time and dates.

Location(s)

Sampling locations occur at the outfall, upstream, and downstream of the plant. If locations were not sampled before the NARP, new locations were chosen depending on ease and availability of crossings. The graph below and corresponding maps illustrate the locations of all Group sampling locations.

One additional upstream point was chosen. The location is closer to the headwaters of Middle Fork Saline River. It is located upstream of a basin discharging from the West End Landfill and the American Coal Company coal mine. Two additional downstream locations were also chosen. This will provide a better characterization of other inputs in the Saline River watershed.

Saline River NARP	Sample Location			Waterbody/ Receiving Water	NPDES Permit No.
	Site	Latitude	Longitude		
Harrisburg	Outfall 001	37.751183	-88.513853	Middle Fork Saline River	IL0029149
	Upstream McFarland Rd	37.866917	-88.683461	Middle Fork Saline River	
	Upstream	37.762035	-88.521372	Middle Fork Saline River	
	Downstream Ingram Hill Rd	37.709254	-88.492314	Middle Fork Saline River	
	Downstream Rocky Branch Rd	37.702381	-88.419274	Saline River	
	Downstream Il-1	37.703829	-88.286069	Saline River	



Saline River NARP: Sampling Locations
Sampling Locations
Downstream
Outfall
Upstream
Harrisburg POTW
Saline River Watershed
0
3.5
7 Miles
N
Indiana
Kentucky
Ohio River
Greater Egypt Regional Planning and Development Commission, 2024.
Data Sources: U.S. Census Bureau, U.S. DOT, U.S. EPA, U.S. Forest Service, USFWS, ISGS, USGS National Watershed Boundary Dataset, HAZUS CDMS, Big Muddy NARP POTWs, Greater Egypt, ESRI topographic basemap

Greater Egypt Regional Planning and Development Commission
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GERPDC-2024-XXXX