

ESTABLISHING A WATERSHED PARTNERSHIP



HOW TO PROLIFERATE CONNECTIONS BETWEEN POINT AND
NONPOINT SOURCES OF NUTRIENTS TO MEET PERMIT
REQUIREMENTS AND IMPROVE WATER QUALITY



ENVIRONMENTAL POLICY
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ABOUT

Sand County Foundation is a nonprofit conservation organization dedicated to working with private landowners across North America to advance ethical and scientifically sound land management practices that benefit the environment. The Environmental Policy Innovation Center (EPIC) is a fiscally sponsored project of Sand County Foundation.

The mission of EPIC is to build policies that deliver spectacular improvement in the speed and scale of conservation. We focus on a narrow set of strategies:

- Improving policies that allow private sector funding or stewardship to expand or supplant public or charitable conservation work
- Transforming government policies to focus on what matters— outcomes
- Eliminating the organizational barriers that prevent public agencies from adapting to 21st century solutions

EPIC's agriculture program uses cutting-edge technologies and novel policy solutions to 1) develop new sources of demand for conservation outcomes, 2) ensure conservation dollars are spent as cost-effectively and quickly as possible, and 3) incentivize the creation of new solutions to the most pressing resource concerns.

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EXECUTIVE SUMMARY

This guide is for Iowa municipalities who wish to establish a Nutrient Reduction Exchange agreement between the municipality and the Iowa Department of Natural Resources (IDNR), which is commonly referred to as a “watershed partnership”.

Cities or sanitary districts typically have wastewater treatment plants that discharge treated effluent into local surface waters. This discharge is regulated by the IDNR under the National Pollutant Discharge Elimination System (NPDES). Iowa adopted a nutrient reduction strategy in 2013 that recommended all permitted point source discharges should reduce nitrogen levels in their discharge by 2/3 and phosphorus levels by 3/4 compared to base levels. Many Iowa cities are struggling to meet those nutrient level targets in their discharges and are facing expensive upgrades to their treatment plants in order to reduce nutrient levels in their discharge.

The Sand County Foundation has been working with cities and towns in Iowa since 2020 to provide an additional option for municipalities. Permit holders interested in participating in the Nutrient Reduction Exchange can negotiate a memorandum of understanding (MOU) agreement with the Iowa DNR that offers regulatory certainty and establishes how the municipality can generate nutrient credits or offsets to avoid penalties for nutrient discharges that exceed their permit target levels. An MOU with the state DNR enables cities and sanitation districts to offset nutrient levels in their point source discharge by reducing contamination from nonpoint sources in their watershed. To make this process easier, a [template](#) is available on the Sand County Foundation [website](#).

This how-to guide provides step-by-step instructions and recommendations—based on the learnings of the Sand County Foundation team in Iowa from 2020 through 2023—for any permitted municipality to develop and execute a watershed partnership. These steps span developing a coalition of stakeholders through publicizing complete projects financed by the partnership.



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BACKGROUND

The Iowa Nutrient Reduction Strategy is a science- and technology-based framework to assess and reduce nutrients to Iowa waters and the Gulf of Mexico. It is designed to direct efforts to reduce nutrients in surface water from both point source and nonpoint sources in a scientific, attainable, and cost-effective manner. Its development was prompted by the [2008 Gulf Hypoxia Action Plan](#) that calls for Iowa and states along the Mississippi River to develop strategies to reduce nutrient loadings to the Gulf of Mexico. The Action Plan establishes a goal of at least a 45% reduction in total nitrogen and total phosphorus loads where the Mississippi enters the Gulf. The strategy will thus intensify efforts to reduce nutrients in Iowa's surface waters to improve water quality for downstream users and enhance recreation on Iowa's streams and rivers. In 2013, the [Iowa Nutrient Reduction Strategy](#) was adopted after endorsement by the Iowa Department of Agriculture and Land Stewardship, the Iowa Department of Natural Resources, and the Iowa State University College of Agriculture and Life Sciences. The strategy is periodically reviewed and updated and includes an [online dashboard](#) for sharing data and tracking progress towards the nutrient strategy goals.

It is worth noting that [most](#) of the nutrients and sediments in Iowa's surface waters originate from agricultural sources, with point sources like municipal and industrial discharges contributing relatively small amounts of nutrients. Nutrient runoff from farm fields or livestock manure (except from [CAFOs](#)) is considered nonpoint source pollution and is not regulated under state and national laws, while point source discharges from industrial or wastewater treatment plants are regulated by the IDNR. Iowa statutes also include a provision that the state cannot mandate or force municipalities (which typically own wastewater treatment plants) to implement solutions they cannot afford. A common strategy for cities struggling to comply with reducing nutrients in their discharge has been to hire a third party to do a feasibility study on how the permit holder can meet target levels of nutrients in their discharge. A common conclusion of these feasibility studies is that the municipality is discharging more nutrients than their target levels, but the city cannot afford to fix the problem, leading to no enforcement action. The expense to relatively small communities to build new wastewater treatment plants really can be cost-prohibitive, and wastewater treatment requirements may change in the near future as new health challenges like poly- and perfluoroalkyl substances ([PFAS](#)) and pharmaceuticals in water are discovered and addressed through regulation.

A memorandum of understanding (MOU) is an agreement between the Iowa Department of Natural Resources and a holder of a nutrient discharge permit—typically a city or sanitary district but also potentially a business—that creates a watershed partnership. It allows the permit holder to credit reductions in nutrients generated from green infrastructure and agricultural best management practices to offset nutrients in their discharge that exceed their NPDES permit levels. The strategy addresses reducing nutrient discharges from both point sources (municipalities and industries) and nonpoint sources such as runoff and drainage water from farmed fields.

The MOU defines how the permit holder can generate nutrient reduction credits for practices and structures that reduce nutrient loading in surface waters in the watershed. It also outlines how the permit holder and the DNR will verify and quantify benefits, using a model, such as the [Nutrient Tracking Tool](#), or direct sampling to estimate the quantity of nutrient reductions. Establishing a nutrient reduction agreement with the state is a voluntary option open to all permit holders to meet their nutrient discharge requirements and improve water quality in their watershed. The watershed partnerships defined by these MOUs can be a cost-effective way for permit holders to maintain regulatory compliance while generating co-benefits like wildlife habitat. Municipalities that apply for nutrient reduction credits that are subsequently approved and validated by IDNR can “use” those reductions to offset nutrient levels in their discharge that exceed their target levels. The reductions can also be saved or banked or could ultimately be sold for use by another municipality. One unique aspect of the Iowa Nutrient Reduction Exchange is that the DNR offers a 1:1 nutrient ratio, meaning that one pound of N or P contamination avoided is equivalent to one pound of credit; most other state nutrient exchanges require a 2:1 ratio or higher (e.g., Wisconsin) based on the relative contributions of nonpoint vs point sources in the watershed. Iowa's relatively generous 1:1 nutrient credit ratio allows and encourages municipalities to work in their watersheds to meet their permit requirements while improving water quality for all users.

ESTABLISHING A WATERSHED PARTNERSHIP

This is a step-by-step guide for municipalities interested in offsetting nutrients in their permitted discharge by working in their watershed to reduce nonpoint source runoff through a watershed partnership.

Step 1: Lay the groundwork

This section is relevant to municipalities but is maybe even more important for any NGO that might be working to facilitate watershed partnerships across the region.

Understand permit status:

Obtain an updated Major Municipalities NPDES Excel database from the Iowa DNR Water Quality Bureau. This public record file contains information about the permit status and nutrient discharge levels for the roughly 125 Major (>1 Million Gallons per day total discharge) NPDES municipal permit holders. (Note: a separate file is available that contains industrial discharge permit holders). This is not necessary if you're already aware of your municipality's permit status. Permit holders that are close to, but short of, meeting their target discharge levels and may need minimal offsets to maintain compliance are especially good candidates.

Identify key players:

Understanding which city leaders will champion this approach begins by identifying who is already interacting with the DNR on issues related to their discharge permit. From there, begin talking with the mayor, a city manager, and public works or the wastewater treatment plant employees. Also, consult your contract engineering firm to see if they have experience with green infrastructure. As these relationships are identified, make sure to ask what individuals' goals are for water quality in and around your city.

Build internal support:

Set up an in-person meeting with the city leader or leaders responsible for making decisions related to the physical treatment plant. Make the case for watershed partnerships and a discharge credit program to city leadership as an option to maintain regulatory compliance while potentially allowing the city to delay or defer expensive plant upgrades. Emphasize that the MOU does not obligate action by the permit holder—only lays out an option of generating offsets if it makes sense to do so—and that support for developing these MOUs is usually available at no cost.

Get to know allies:

Several state organizations related to water and wastewater treatment are aware and supportive of the opportunity to establish water quality partnerships. Outreach through organizations like the [Iowa Water and Environment Association](#), [Iowa League of Cities](#), [Iowa Onsite Waste Water Association](#), and the [Iowa Rural Water Association](#) can help build your network and confidence for trying new approaches.

Step 2: Create the memorandum of understanding

The agreement outlines and identifies procedures and tactics that the city may use to generate credits or offsets to their permitted discharge by reducing nutrient contamination from nonpoint sources in their watershed.

Outline the MOU:

The MOU agreement between the permit holder and IDNR contains information about how the municipality can generate nutrient offsets, how they can be quantified, and offers assurance of how the permit holder can maintain regulatory compliance through generating nutrient credits or offsets from watershed work. The outline should include the purpose, background, and goals of the agreement, and

identify the length, terms, and reporting results to be shared with the Iowa DNR. MOUs may be customized by both parties to specifically mention unique opportunities for nonpoint nutrient reduction projects or opportunities in their watersheds.

Intergovernmental Agreements (28E):

If desired, this is the time to create an intergovernmental agreement so that the MOU can be between DNR and a joint intergovernmental entity. For example, Dubuque signed an intergovernmental agreement between the City and County of Dubuque to collaboratively implement conservation practices to share costs and staff in order to improve water, accelerate conservation practice adoption, reduce flood damage and improve the quality of life in their watershed. Municipalities in the same watershed may wish to collaborate on their MOU by creating this intergovernmental agreement.

Finalize text:

Once the main purposes of the MOU have been outlined, it becomes relatively straightforward to plug those and city details into the MOU [template](#). This is a good time to send a draft to DNR to ensure they have no objections, especially if you deviate significantly from the template.

Sign the MOU document:

The MOU should be signed by a representative of the permit-holder, usually the head of a city or sanitary district. In the case of a city, your city council, mayor, or administrator will likely want to directly approve the document, so be sure to leave plenty of time to align with their meeting schedule.

Submit the MOU to Iowa DNR:

Email a copy of the MOU signed by the municipality to the Water Quality Resource Coordinator at the Iowa DNR for their signature. It may take weeks to receive their signature back, but the processing time is shrinking.

Issue a press release:

Completing an MOU between a municipality or permit holder and the Iowa DNR provides an opportunity to publicize the proactive steps city officials are taking to improve water quality for all residents. Municipal employees should be prepared in advance to send out a press release that informs the public on steps local leaders are taking to improve water quality and maintain regulatory compliance. Engaging with local and statewide media may attract new participants and funders to the watershed partnership.

Step 3: Implement new conservation practices in the watershed

Once a municipality has established and signed an MOU with the DNR, they may or may not have experience or expertise promoting conservation with farmers and landowners to reduce nutrient contamination of surface waters. In fact, most cities have little experience working outside their political boundaries. They often need help, resources, and partnership with other agencies and non-governmental organizations to begin to implement new conservation practices with farmers and landowners in their watershed. There are typically three approaches municipalities have used:

Buy from an aggregator:

One of the easiest ways for municipalities to meet their permit requirements using a watershed partnership is to work with an ecosystem services provider or aggregator who then contacts and pays farmers and landowners for adopting new conservation practices on the city's behalf. A city will sign an agreement with the aggregator to purchase some pounds of nitrogen and phosphorus reductions at a set price per pound. Examples of aggregators include the [Soil and Water Outcomes Fund](#) established by the Iowa Soybean

Association. Private companies like [IndigoAg](#), and a number of agri-business companies like Bayer, Yara, Nutrien, and Land O' Lakes are establishing business units to accumulate and sell ecosystem services and outcomes. The non-profit [Ecosystem Services Market Consortium](#) provides a similar program that can reward landowners for practices that sequester carbon in the soil while reducing nutrient losses. These aggregators may take care of applying for the credits on the city's behalf, making this the most turn-key option.

Do it yourself:

Cities or sanitary districts can go it alone and use their own resources and employees to initiate programs to accelerate conservation practices in their watershed. Cedar Rapids pioneered this approach beginning in the early 2000s. The Cedar River flows through the town and is subject to flooding and degraded water quality following large rainfall events upstream. City leaders made a concerted effort to reach out to farmers and landowners upstream to encourage and subsidize in-field and edge-of-field practices that slow and reduce runoff from large rainfall events. Early success with this program led to more federal and state support to expand the program, and Cedar Rapids has been recognized for their excellent work in improving water quality and generated some of the earliest nutrient offsets to be validated and recognized by the Iowa DNR. Some cities already own farmland (such as near airports) and can easily generate credits on that land by implementing conservation practices or requiring that the farmer to whom the land is leased implement conservation practices; in one case, this was as simple as adding a lease provision that the farmer use cover crops. Cities may also be able to generate credits on city-owned non-farm land such as by building rain gardens or restoring streams. This is less common because it tends to be more costly, but it can be prudent in situations where the city is looking to complete these projects for other reasons.

Create a Watershed Management Authority:

A third, sophisticated approach that some cities have engaged is to partner with counties and other stakeholders to establish a [Watershed Management Authority](#) (WMA). Iowa WMAs were authorized by [legislation](#) passed in 2010, and there are now 28 active WMAs in the state. The Iowa DNR typically funds one or two WMA planning grants annually in which a consulting firm will work to establish a formal organization, create a watershed management plan and help engage stakeholders in the watershed. The benefit of this can be to have a more comprehensive plan to complete larger scale, targeted projects via a coalition of stakeholders.

Step 4: Outreach to educate farmers and citizens in the watershed

Regardless of the main path taken in step 3 above, the municipality should devote some staff resources or contract with local conservation professionals to begin exploring opportunities with farmers and landowners to implement practices that reduce nutrient movement into surface waters, because there are likely at least some very cost effective projects that could be completed with little effort. Cities or permit-holders should be aware of and may want to pursue relevant federal and/or state grants that promote conservation practices. Funds could be provided by a plethora of USDA [Natural Resources Conservation Service \(NRCS\)](#) opportunities like the [Regional Conservation Partnership Program](#) and the [Watershed and Flood Prevention Operations Program](#). USDA's [Agricultural Research Service](#) has developed a program called the [Agricultural Conservation Planning Framework](#), which is a GIS toolkit that helps prioritize areas with the greatest potential for nutrient contamination within a watershed or subwatershed. Once priority areas are identified, another innovative project management method called "[Batch and Build](#)" can facilitate more efficient delivery and installation of edge-of-field practices by installing batches of structures on multiple farms in a sub-watershed at once, thereby accelerating improvements in water quality.

Cities should also identify educational opportunities for other citizens of the watershed. This could be as simple as putting up a sign near a waterway identifying how much conservation practices reduce nutrient loss into water and co-benefits—like wildlife habitat—from these conservation practices. It could include presenting at schools or community events about the projects the city has funded. As before, opportunities to engage with media can also help inform the general public.

Step 5: Apply for credits

When conservation projects that reduce surface water contamination are implemented in a watershed, permit holders with an MOU in place can apply to have these credits or reductions verified by the Iowa DNR. Common practices that qualify include edge-of-field structures such as buffer strips, saturated buffers and/or bioreactors. Typical in-field management practices include the use of cover crops and reduced tillage or no-till. But any practice that can be quantified by the Nutrient Tracking Tool—or another model if agreed to in the MOU—can qualify for generating credits. DNR personnel are still developing and standardizing the methods and processes for validating submitted reductions, and they are working on the system to accommodate electronic submission of a batch of practices covering a number of fields at the same time. The DNR relies on input from the [Iowa Nutrient Research Center](#) and more specifically, a scientific advisory panel that meets periodically to provide input on Iowa's nutrient offset program. It is likely that the final verification process will include duplicating model runs from the submitted credit application, some level of application audit, potential field checks, and/or nutrient water sampling.

The current process for permit holders with an MOU in place to apply for nutrient reductions includes submitting a form to the Army Corp of Engineers' [RIBITs](#) (Regulatory In-lieu fee and Bank Tracking System). The submission should also include a map and legal description of the field treated, a summary narrative covering the practice applied, the year credit is claimed, a photo of the field or edge-of-field practice, and a receipt documenting that cover crop seed and/or custom application was purchased. The final inputs to the model used to quantify the pounds of nitrogen and phosphorus prevented, such as slope, acres treated, soil type, and more. The application should include the data set submitted and outcome from the model used to estimate the quantity of nutrients that were prevented from entering the stream due to the conservation practice applied.

The DNR is currently accepting submissions that use the models developed by the USDA Agricultural Research Service and available to the public online in the form of the [Nutrient Tracking Tool](#) (NTT). The NTT is a web-based, site specific application that estimates nutrient and sediment losses at a field scale, and can estimate the impacts of different crop and soil management practices. It does not estimate the nutrient and sediment losses from non-agricultural land uses, including urban practices such as nutrient management in turf, rain gardens, permeable pavers and other urban water quality management practices. Some Iowa municipalities installing these practices have secured MOUs that use output from the [Minimum Impact Design Standard](#) (MIDS) model from the University of Minnesota that estimates sediment and nutrient losses in stormwater runoff.

Once the Iowa DNR approves the reductions submitted by a permit holder, the quantity of reductions are uploaded to the publicly available RIBITs database. These reduction credits can be used by the municipality to offset nutrients in their treatment plant discharge immediately, or they can be banked and saved for later use. They can even be sold to third parties such as other cities or industrial users.

At this time, applications for nutrient reductions can be submitted in the future. Some cities with MOUs in place with the DNR have decided they will collect all the data needed for submission, but not to submit the application until some future date or when the reductions are needed. Officially, the DNR has stated that the lookback period for permit holders to apply for reductions dates to practices implemented after Iowa adopted their Nutrient Reduction Strategy (2013) with the provision that the municipality must be materially involved with implementing the reduction, not simply taking credit for conservation practices implemented by landowners on their own.

CONCLUSION

It is the hope of the authors that this guide can be a helpful resource for Iowa municipalities seeking practical and effective ways to meet the necessary nutrient reduction targets set by the Iowa Department of Natural Resources. The flexibility provided by a watershed partnership MOU offers a viable and innovative solution for cities and sanitary districts to comply with environmental regulations while minimizing financial burdens. Drawing from the experiences and insights gathered since 2020, this guide provides a clear, actionable pathway for municipalities to establish successful agreements with the IDNR. Looking ahead, the adoption of such partnerships is not only crucial for meeting regulatory requirements but also for fostering a more sustainable and environmentally responsible approach to wastewater management in Iowa and beyond. It provides a useful example of a mechanism to finance outcomes-based conservation. Hopefully the successes in Iowa set a precedent for future environmental collaborations, highlighting the potential for similar strategies in other regions and with other resource concerns.



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