Establishing Strategies for a Transportation MS4

Final Report

SPR Project RB36-013

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Acknowledgements

Special thanks to the many Iowa Department of Transportation (DOT) staff and leadership who participated in the development of this project and report.

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Technical Report Documentation Page

1. Report No. SPR RB36-013	**2. Government Accession No.**	**3. Recipient Catalog No.**	
4 Title and Subtitle Establishing Strategies for a Transportation MS4		**5 Report Date** 05/01/2015	
		6 Performing Organization Code	
7. Author(s) Rebecca Kauten		**8 Performing Organization Report No.**	
9 Performing Organization Name and Address Division of Sponsored Programs Main Office - 2 Gilmore Hall The University of Iowa Iowa City, IA 52242 319-335-2123		**10 Work Unit No. (TRAIS)**	
		11 Contract or Grant No.	
12 Sponsoring Organization Name and Address Iowa Department of Transportation 800 Lincoln Way Ames, IA 50010 and the Federal Highway Administration		**13 Type of Report and Period Covered** Final Report	
		14 Sponsoring Agency Code SPR RB36-013	
15 **Supplementary Notes**			
16 Abstract The objective of this project has been to identify best practices and approaches to MS4 program planning for the Iowa Department of Transportation. Information is primarily based on existing state MS4 programs as examples and references for use as an agency-based MS4 program is developed.			
17 Key Words Stormwater management, NPDES Compliance, Watersheds, Water Quality		**18 Distribution Statement** No restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161	
19 Security Classification (of this report) Unclassified	**20 Security Classification (of this page)** Unclassified	**21 No. of pages**	**22 Price**

Form DOT F 1700.7 (8-72)

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June 30, 2015

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Initial Problem Statement

The National Pollutant Discharge Elimination System (NPDES) was established by the U.S. Environmental Protection Agency as a means of addressing surface pollution from both known (point) and non-specific (non-point) sources. The program impacts industrial wastewater, runoff from active construction sites, and stormwater runoff as it is managed within municipal separate storm sewer systems, or MS4 communities. As part of NPDES permit requirements nationwide, all permitted MS4s must establish a Stormwater Management Program for comprehensive planning and adaptive management.

According to USEPA, the regulatory definition of an MS4 (40 CFR 122.26(b)(8)) is "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

- Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created to or pursuant to state law) including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States.
- Designed or used for collecting or conveying stormwater;
- Which is not a combined sewer;
- Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2."

In practical terms, operators of MS4s can include municipalities and local sewer districts, state and federal departments of transportation, public universities, public hospitals, military bases, and correctional facilities. Each regulated MS4 is required to develop and implement a stormwater management program (SWMP) to reduce the contamination of stormwater runoff and prohibit illicit discharges.

Regulatory Compliance

The intent of environmental regulation is to minimize, if not eliminate pollution. Permits are established as a means of defining activities and establishing parameters to determine the scope of compliance and metrics by which performance is measured. The structure and processes related to an agency-wide MS4 program are defined (and

approved) by the language contained in the permit. However, the permit itself is not the key to compliance. The activities and obligations identified within serve as the means to program compliance. The goals and vision of a comprehensive environmental compliance program should include the following key elements:

Clear, Consistent Language: Ensure every DOT employee understands at a basic level the objectives of the agency MS4 program. If staff can understand, compliance is more likely. If regulators observe broad understanding among staff, they too should be able to understand the goals and objectives.

Flexible: While regulatory requirements often do contain rigid restrictions, opportunities do exist for interpretation and inclusion of new approaches. Keep options open for innovative practices, incorporating new technology, and engaging with "new" stakeholders who may not traditionally be included in the decision making process.

Streamlined: While compliance activities may be distributed across the entire agency, ultimate responsibility should lie within one division or one program contact to promote efficiency. One person will submit the final permit and subsequent reports. This is not a likely activity to be shared among multiple staff.

Transparent, Trackable, Enforceable: Public agencies are obligated to ensure transparency in government. This includes the availability of records, documents and other pertinent information. A website dedicated to general public information on MS4 compliance helps ensure transparency. By tracking compliance activities, corrective actions are more effectively enforced. In addition, public funds allocated for compliance activities may be more efficiently utilized.

Regional approach: Regulatory activities occurring within the regional states of Iowa, Nebraska, Kansas and Missouri are based on decisions made by the US Environmental Protection Agency, Region VII office in Kansas City. By sharing information across state boundaries, transportation agencies can learn from past experiences, and better plan for future needs.

As stated by Barry Fagan of Alabama Department of Transportation (ALDOT), "Transportation may not be the largest polluter, but there is still an impact from our actions." The current approach to environmental compliance is to concentrate on each individual permit requirement for jurisdictional wetlands, NEPA compliance, and other environmental regulations. Fagan suggests applying a "combined compliance" approach, where all environmental permits are coordinated through a comprehensive, agency wide approach.

Consent Decrees as Indicators: In recent years, Kansas, North Dakota, Colorado and Missouri transportation agencies have faced consent decree requirements related to construction site erosion and sediment control. As recommended by peer exchange participants, this report recommends Iowa DOT pay close attention to actions and progress related to consent decrees underway in adjacent states. While not a guarantee of future events, Iowa DOT can initiate activities recommended by this report to proactively address common issues, themes and trends related to comprehensive MS4 compliance. By starting now, rather than waiting for others to require action, Iowa DOT maintains a current level of autonomy, and may establish program elements worthy of negotiation with regulatory agencies. Furthermore, a proactive approach may more thoroughly educate DOT staff across divisions in a way that ensures both acknowledgement of MS4 program requirements, but also support of required actions to be taken.

Minimum Control Measures (MCMs)

MS4 permit holders are expected to maintain a Storm Water Management Plan (SWMP) following the minimum control measures (MCMs) as defined by USEPA. When implemented, MCMs should result in a significant reduction in pollutants discharged into receiving waters. The minimum measures, as defined by USEPA, are outlined below:

Public Education/Outreach – Defines and establishes methods, strategies and tools to inform the public about MS4 management programs and describes ways to reduce stormwater pollution.

Public Participation/Involvement – Describes and defines methods and strategies to involve the public in developing, implementing, and reviewing MS4 management programs and promotes ways to reduce stormwater pollution.

Illicit Discharge Detection and Elimination (IDDE) – Establishes methods and practices for identifying and eliminating illicit discharges and spills to storm drain systems and inlets to waters of the US.

Construction Site Runoff Control – Establishes methods and practices for MS4s and construction site operators to address stormwater runoff from active construction sites.

Post-Construction Runoff Control – Establishes methods and practices for MS4s, developers, and property owners to address stormwater runoff after construction activities have ended.

Pollution Prevention/Good Housekeeping – Describes methods and practices for ongoing maintenance, observation and action to ensure or reduce negative impacts to waters of the U.S.

As of 2014, Iowa DOT remains the only state transportation agency within the United States without an MS4 permit or that does not operate under the guidelines of an MS4 permit regarding stormwater management.

It is anticipated that the Iowa DOT will be required to obtain an MS4 permit from the Iowa Department of Natural Resources (DNR) in the future. The research generated as a result of this project is intended to provide a strategic approach and recommendation for Iowa DOT as it develops a plan for agency-wide and agency-specific MS4 program implementation.

Research Objectives, Methods & Approach

The overall objective of this project has been to identify best practices and approaches to MS4 program planning for the Iowa Department of Transportation. Information is primarily based on existing state MS4 programs as examples and references for use as an agency-based MS4 program is developed.

- Extended literature review of existing transportation MS4 programs in the Region VII EPA regulatory region: Iowa, Kansas, Missouri, and Nebraska.
- Peer Exchange facilitation for further evaluation of other state MS4 program components.
- Develop cost and time estimates for implementation of various MS4 program components.

Literature Review: The project objectives have been driven primarily by information gathered from existing DOT/MS4 programs. Existing MS4 program documentation from Region VII states was gathered, reviewed and critiqued for content and relevance to both federal regulatory requirements and relevance for application by Iowa DOT.

Peer Exchange Facilitation: A one-day peer exchange among the Region VII state transportation agencies occurred in conjunction with the Great Rivers Chapter of the International Erosion Control Association annual conference in Kansas City, Missouri. This event took place October 27 and 28, and concluded with a transportation MS4 panel discussion presented to conference attendees on October 29.

Material/Procedure Development: Data collected and analyzed as part of this project is intended to assist with establishment of an overall, agency-wide strategy for

implementing an MS4 program. An important goal of the project is to recommend a cost-effective, practical strategy for proper program implementation. Timelines and budgetary recommendations are based on information gathered as part of this research project.

Initial Results

The following section summarizes relevant details, comments and practices identified through the course of the research related to each of the six MCMs as defined by USEPA. For each MCM, information has been segmented based on the source of information such as survey, literature review, peer exchange, etc. An initial literature review and state transportation agency survey was conducted by the researcher through a previous contract with the University of Northern Iowa. This summary includes relevant details from this project, as the content remains relevant to the final recommendations of this report. Appendices to this report include results from activities as documents of record. A previous report submitted on behalf of the University of Northern Iowa contains survey and literature review content, as well as summative data related to activities regarding these project deliverables. Appendix 4 lists notable activities discovered as part of this initial research.

MCM 1: Public Education/Outreach

EPA Definition: Defines and establishes methods, strategies and tools to inform the public about MS4 management programs and describes ways to reduce stormwater pollution.

Summary of Key Findings: Table 1 lists a series of key findings related to MCM 1. To summarize, most state transportation agencies rely upon volume production of printed materials for outreach, with limited effort to measure effectiveness. No formal structure tends to exist for transportation agencies regarding public education and outreach, therefore the default is often an effort to make municipal MS4 outreach efforts "fit" the needs of transportation agencies. The Adopt-a-Highway Program is one nationwide initiative recognized by many transportation agencies as an effective means of both engaging and informing citizens on litter reduction.

Barry Fagan stated, "We (as transportation agencies) engage in activity that could impact the environment. There is an expectation from our neighbors we need to honor and address." His comments reinforce the meaning of outreach and engagement as key MS4 program components. This includes both internal and external education on

agency goals, performance metrics, and an ongoing effort toward successful program implementation. The result is compliance with a federal environmental permit, but moreover, success also means cleaner water for local communities and a healthy working relationship with local partners.

Source	Key Findings
MS4 Program Literature Review	Most state transportation agencies produce flyers/brochures at the rest stops throughout the state. Another major source for public education has been creating websites for MS4 programs. When doing this, detailing and explaining the potential hazards of Stormwater runoff have been key components, particularly for Virginia and Missouri DOT MS4 programs. All state transportation agencies assessed include reports on stormwater runoff publicly available online. Michigan has taken it a step further than most and has been publishing stormwater articles in Michigan DOT publications. Many states have held classes focused on educating contractors on stormwater runoff and erosion control.
State Transportation Agency Survey	No formal structure exists for most transportation agencies regarding public education and outreach. The six-state literature review indicates the leveraging of existing DOT programs such as the Adopt-a-Highway program, use of seasonal staff and interns, and pesticide applicator certification as compliance-based action.
Day-Long Session with Barry Fagan, Alabama DOT	"[Transportation agencies] engage in activity that could impact the environment. There is an expectation from our neighbors we need to honor and address."
June, 2014 Peer Exchange	Most education is internal. Primary public is internal. Staff and contractors. Secondary audience is more of the general public. MCMs 1 and 2 are combined for NDOR MS4 permit.
October, 2014 Peer Exchange	Are we truly measuring effectiveness in volume? Do these materials as stand-alone items affect change?

TABLE 1: SUMMARY OF MCM1 KEY FINDINGS FROM PROJECT DELIVERABLES AND ACTIVITIES.

MCM 2: Public Participation/Involvement

EPA Definition: Describes and defines methods and strategies to involve the public in developing, implementing, and reviewing MS4 management programs and promotes ways to reduce stormwater pollution.

Summary of Key Findings: Table 2 lists a series of key findings related to MCM 2. To summarize, both internal and external audiences are included in the "public" targeted for involvement in MS4-related activities. Public meetings, cleanup days, and annual events often serve as opportunities for stakeholder engagement. Again, no formal process exists specific to the needs of transportation agencies, so the default approach tends to mimic municipal MS4 programs. Peer exchange feedback both in June and October indicate the need to categorize public audiences based on both primary and secondary audiences, as well as internal and external contacts.

Source	Key Findings
MS4 Program Literature Review	The primary way that states have been getting the public involved is through meetings and clean-up events. The best, and one of the most involved, example of this is the State of New York where in addition to their Adopt-A-Highway program they hold a major Spring Clean Up event. In 2005 63 tons of garbage was collected from New York roadsides. To gain even more attention on the subject New York has used state employees to clean up their highways in hopes of reminding people that litter doesn't just look bad but it cost the tax payers money. Many states have also focused on training state employees on stormwater issues as well. Other tactics have included annual public meetings which are intended to not only educate the public but also give them a forum to place their concerns with policy regarding MS4 programs.
State Transportation Agency Survey	Regarding stakeholder engagement, most agencies have no formal process, but rely upon mostly annual external outreach and monthly internal contact in some form.
Day-Long Session with Barry Fagan, Alabama DOT	Phase II MS4 program roll-out for ALDOT included public comment. There are things that can be incorporated now. Outcomes: • Initially educating stakeholders on what other states are doing. • Hear first-hand what stakeholders do, and how a transportation MS4 can impact.
June, 2014 Peer Exchange	Primary and secondary public categories.
October, 2014 Peer Exchange	Primary Public: Regulators, Contractors, Staff Secondary Public: General Public, Adjacent Land Owners

TABLE 2: SUMMARY OF MCM2 KEY FINDINGS FROM PROJECT DELIVERABLES AND ACTIVITIES.

MCMs 1&2: Considering Stakeholder Engagement

The need to engage with stakeholders was discussed during the two peer exchanges as part of this research project. On multiple occasions, the concept of primary and secondary stakeholder audiences was discussed. Within both categories, internal and external audiences were also considered. Primary stakeholders were identified as those with direct ties and/or impacts to regulation as a result of an MS4 permit. Examples are depicted in Table 3, with both the general audience and related questions identified. The purpose of the questions were to 1: Determine the type of activity to be changed as a result of engagement; 2: How these stakeholders hold Iowa DOT accountable, and 3: What results as long-term outcomes should be achieved as a result of such engagement.

During the October peer exchange, the group identified examples of primary public as regulators, contractors and internal staff directly involved with MS4 compliance. Desired change to be affected included overall environmental compliance, improved program performance and maintaining those best practices already in place as an agency or partner. Accountability is assumed by proactive planning that encourages environmental stewardship, and an effort to move away from punitive action. Outcomes anticipated as a result of such action include overall raised awareness of environmental impact and risk from DOT activities, improved, effective communication across all feedback loops, a more unified operation as an organization and a common language or nomenclature for all staff and partners to use as a result of MS4 program implementation. Long term, the goal is for general, agency-wide acceptance of the "This is just what we do" approach to environmental compliance and management.

Secondary stakeholders include DOT staff indirectly involved with MS4 compliance, as well as the general public and other agency partners. In the case of external secondary public as stakeholders, there is a citizen-based expectation of Iowa DOT for both environmental regulatory compliance and a cleaner, safer environment related to soil and water quality. Engagement and outreach efforts can concentrate on raising awareness of agency activities related to MS4 compliance, and growing public understanding of services offered from a transportation agency. As a result, improved communication and growing trust can be established.

For both primary and secondary stakeholders, and especially for the general public, the goal of growing and maintaining trust as an agency was prevalent in both peer exchange sessions. Question such as "How do your activities relate to your list of stakeholders?" and "What change are you trying to affect for each?" are intended to shift measures of success from quantity to quality. Historically, agencies and regulators

have encouraged production of printed materials and generating website hits as a measure of success. While such metrics do quantify volume, the measurements do not serve as indicators of change. Iowa DOT is encouraged to consider a more qualitative approach to both assessing stakeholder opinions, as well as measuring change over time and as a result of specific action. Surveys are one example of quantitative analysis to generate qualitative results. By surveying stakeholders before and after projects, perceptions and attitudes may be compared over time. Should long-term strategies for stakeholder engagement occur, levels of trust and assurance by the public may also be measured to indicate improvement over time.

"Primary Public"	**"Secondary Public"**
Regulators Contractors Staff directly involved with MS4	Staff indirectly involved with MS4 General Public Adjacent Land Owners
What change do YOU want to affect as an agency?	**What change do OTHERS want to affect?**
-Environmental Compliance -Improved Performance -Maintain "good" status quo	- Environmental Compliance (regulators) - "Better," cleaner, safer environment - Soil/Water quality
How do you hold others accountable?	**How do they hold YOU accountable?**
Promote environmental stewardship Proactive versus reactive approach Move away from punitive response	Awareness of agency action Understanding of services offered
What results do YOU want to achieve?	**What results do THEY want to achieve?**
Awareness Effective Communication Unified Operation Common Language Move toward acceptance: This is just what we do.	Open Communication (interagency, across jurisdictions, etc.) TRUST

TABLE 3: SUMMARY OF KEY FINDINGS FROM PROJECT DELIVERABLES AND ACTIVITIES REGARDING PRIMARY AND SECONDARY PUBLIC AUDIENCES FOR MS4 ACTIVITIES.

Construction-related training activities already occur as part of the Iowa DOT erosion and sediment control training and certification program. When considering an internal/external training model, specific training on the MCMs related to illicit discharge, post construction and good housekeeping are recommended. As a means of improving outreach and involvement activities, training on work with adjacent land owners and interagency relations such as with Departments of Agriculture and/or Natural Resources may prove beneficial to staff.

Deliverables for primary and secondary audiences may differ in terms of detail and/or depth of knowledge. Examples of each are listed in Table 4. Primary audiences may assume a more detailed knowledge and/or skill set related to MS4 compliance. As a result, engagement deliverables may be more project specific, or technically worded. Examples include specific training sessions, internal plan review and comment periods, pre-construction meetings, and engagement with the specifications committee.

Secondary engagement may be at more summarized, general level of detail. Internal secondary audiences may include program and administrative management as a means of briefing and updating on status; providing online and phone reporting systems for the public, hosting public hearings on projects, and partnerships with agencies, watershed groups, and other local entities to gather feedback. By engaging with the public on a regular basis, Iowa DOT gains notoriety and grows credibility among the community. Alabama DOT solicited public comments on the agency MS4 permit as a means of stakeholder engagement. Nebraska Department of Environmental Quality also solicits public comments for the NDOR permit. As a proactive means of public involvement and outreach, Iowa DOT may consider soliciting feedback once an initial MS4 permit is written.

Primary	**Secondary**
Training Implementation Compliance Technical Advisory Group /Quarterly Update Winter Training Session Plan Review/Comment Periods Env./Concurrent Point Planning Meetings Specifications Committee Project Meetings/Pre-Con	Director Updates Interagency Report Report-a-Problem Hotline/Website Public hearings on projects (MO requires recording) Interagency meetings/presentations Partner with MS4 groups Partner with watershed groups Gain notoriety. Grow credibility.

TABLE 4: EXAMPLES OF SPECIFIC DELIVERABLES INTENDED FOR PRIMARY AND SECONDARY PUBLIC AUDIENCES.

MCM 3: Illicit Discharge Detection and Elimination (IDDE)

EPA Definition: Establishes methods and practices for identifying and eliminating illicit discharges and spills to storm drain systems and inlets to waters of the US.

Summary of Key Findings: Table 5 lists a series of key findings related to MCM 3. To summarize, illicit discharge detection tends to be one of the more challenging aspects for MS4 compliance as a non-municipal entity. Mapping inlets and outfalls of linear projects and statewide road systems can prove both daunting and inefficient. However, most state transportation agencies implement spill response plans and public reporting hotlines for response. Chlorides may become a greater water quality concern in the future, therefore current monitoring practices are recommended to continue. Much of ongoing IDDE activities will fall under the guise of maintenance programming, therefore training and insight to MS4-related IDDE activities will become necessary training for maintenance staff. Rather than monitor every inlet and discharge point in a statewide road system, prioritization and coordination with local MS4 programs in DOT Districts may be a more efficient strategy.

Source	Key Findings
MS4 Program Literature Review	The primary way MCM3 has been implemented has been through the mapping of drainage outfalls. Some states have just focused on the outfalls while others, Minnesota being the best example, have gone further and inventoried all the sewer systems with DOT pipelines, manholes, basins, aprons, ditches, and ponds. Some states have also implemented training programs for employees on the hazards stormwater and erosion control (this method has been used in both control measure 2 and 3). The idea behind this training is that it will allow employees to identify illegal dumping or other hazards, and provide them with increased knowledge about MS4 programs and stormwater runoff; allowing them to better answer questions that could be asked from the public or businesses that MS4 programs might affect. The final common theme among states is that some have partnered with other agencies the help enforce violations. For example Rhode Island has partnered with their states Environmental Management Agency for help with enforcement of violations.
State Transportation Agency Survey	New activities include development of a hotline for public reporting of potential runoff or illicit discharge activities.

Day-Long Session with Barry Fagan, Alabama DOT	Transportation may not be the largest polluter, but there is still an impact. We want to understand what our impacts are. Target true problems with real impacts. Chlorides may be a future concern. Monitoring program may be a good starting point to know what leaves a DOT site. Maintenance is where the lions' share of work and responsibility fall. • Mapping major outfalls • Defining what major outfalls are (>36" or equivalent) within MS4 areas • GIS database • Illicit discharge monitoring (every outfall in MS4 areas) once annually
June, 2014 Peer Exchange	IDDE – Nebraska Outfall mapping completed with assistance from interns. Getting the initial data points is the hard part. Once you have that, it's mostly about maintenance. • Dry Weather Monitoring (observational, maintenance) • District Incident Reporting Knowledgebase (DIRK) – spill reporting For IDDE, it's about the decisions and directives that led to the discharge. It's about getting people to understand the consequences. Diamond Grinding: Diamond grinding materials are not toxic. The pH level is the concern (11-12). Re-integration to soils is the crux of concern. NE – allowed by rule. No permit required, just comply with statewide rules. Agricultural best practices drive existing rule. Research is considering impacts to vegetative growth/decline of grasses for roadsides. Aesthetics and visuals are the biggest down side of the slurry discharge. It generates the perception that something bad has happened. Chlorides: Salt is different from any other pollutant. It's a conservative element that dilutes well, does not settle out, and transports to both surface and groundwater. Any residual salts will degrade soils and other materials, leading to erosion and corrosion. The social and cultural perception of salt, in the shops and elsewhere, is that it is not scary and it's a low priority.

October, 2014 Peer Exchange	Most challenging for transportation agencies due to the unequal comparison to municipalities. Linear challenges for transportation vs. MS4 cities: • Point sources • Illegal connection • Municipally maintained infrastructure (storm sewer system) Spill Management/Response Plan: proactive knowledge and planned response as viable alternative Other possible alternatives to traditional IDDE: • Incident Tracking • Adequacy Tracking • Adopt-A-Highway • High Priority Outfalls – visual inspection • Explanation of activities • Diamond Grinding Plan

TABLE 5: SUMMARY OF MCM3 KEY FINDINGS FROM PROJECT DELIVERABLES AND ACTIVITIES.

Given the very nature of illicit detection for municipal MS4 permit holders, there are few parallels within a transportation agency structure. As a result, IDDE often proves the most challenging and hardest to define in terms of scope and impact. Examples of municipal IDDE concerns include point sources from discharge pipes, illegal wastewater connections to city storm sewer systems, and the overall management of a city-wide storm sewer infrastructure. For linear construction projects, IDDE incidents occur as a result of traffic-related incidents, run-on from adjacent properties, liquids leaked from motor vehicles and tankers, and solid waste from roadway litter.

A justifiable alternative to a traditional, municipality-oriented IDDE program may be to incorporate a Spill Management/Response Plan as part of an effective MS4 strategy. Similar to a city IDDE program, a spill management plan provides proactive knowledge and planned response for incident and adequacy tracking, explanation of activities and response, and appropriate record keeping for reporting purposes. Litter may be addressed through Adopt-a-Highway programs, already implemented statewide.

Table 6 lists two public outreach activities that may also double as IDDE activities: the Adopt-a-Highway program and online or phone-based public reporting systems enable more distributed awareness and action regarding accidental spills and other unintended discharges from land managed by Iowa DOT. Should Iowa DOT choose to coordinate with municipal MS4 programs, priority outfalls and storm drain inlets may be comprehensively mapped based on existing MS4 city data sets. From this initial inventory 20 percent may be prioritized due to impact on adjacent water bodies,

volume of runoff, or local decision making. A hotline and online reporting system provides the public access to DOT to notify of spills and other potential environmental risks. The Adopt-a-Highway measure of success can be directly measured by the weight and volume of trash removed from roadways. Public use of the reporting system, as well as measured response time can be used to measure success for the reporting system.

Diamond grinding is one common DOT practice to be factored into an IDDE strategy. Nebraska Department of Roads (NDOR) established an agency-wide diamond grinding plan, which is included as part of the overall MS4 program for the agency. NDOR requires a separate diamond grinding permit for related activities. This may also be something for Iowa DOT to consider as a means of effective and planned response to potential environmental risk.

Practice	What "change" are you trying to affect?
Adopt-A-Highway	Reduce litter
Hotline/Online Reporting System	Engage public in addressing spills/litter concerns

TABLE 6: OUTREACH/INVOLVEMENT ACTIVITIES WHICH MAY ALSO ADD BENEFIT FOR IDDE IMPLEMENTATION.

Audiences for IDDE information should also be carefully considered. Table 7 lists internal and external audiences to be considered for varying levels of training and awareness on IDDE issues. Staff directly involved with potential IDDE incidents require a higher level of training and awareness versus members of the general public. Conversely, contractors should be made aware of incident reporting practices, and trained on how to use a Spill Management and Response Plan as a quality assurance approach to reducing risk. In addition, designers may consider the potential for future IDDE risk when planning drainage systems for new construction projects, or retrofitting existing locations.

Internal	External
Maintenance District Staff Construction Design	Contractors during ESC training Peer exchange – cross training Web presence – quantified response

TABLE 7: INTERNAL AND EXTERNAL AUDIENCES RECOMMENDED FOR VARYING LEVELS OF IDDE TRAINING.

MCM 4: Construction Site Runoff Control

EPA Definition: Establishes methods and practices for MS4s and construction site operators to address stormwater runoff from active construction sites.

Summary of Key Findings: Table 8 lists a series of key findings related to MCM 4. To summarize, construction activity serves as a primary element of most MS4 programs. This is often due to the initial enforcement actions related to erosion and sediment control compliance on construction sites. State agencies have partnered with environmental management agencies in some instances to manage enforcement actions, and training programs tend to dominate the activity of most programs. All agency divisions involved in either planning, design, construction or maintenance should have a voice during the project planning and implementation process. When considering the hand-off from construction to maintenance staff, clear communication and expectations should be shared regarding the importance of runoff management as part of an MS4 strategy.

Because of the unique conditions within a transportation agency MS4 program, it is imperative to educate the regulator on both what is possible and what elements of MS4 compliance require adjustment. Transportation agencies are, by definition, not municipalities. Therefore, it is inappropriate to operate or be regulated as such. Regulators may require further understanding of the unique qualities related to linear, often long-term construction projects. Enforcement strategies by transportation agencies may also differ from municipalities due to the scope of contracts and scale of projects.

Source	Key Findings
MS4 Program Literature Review	The primary method used for control measure four is site inspections. For agency oversight inspections, some send inspectors to constructions sites multiple times throughout the project, while others do one random inspection. This is above and beyond the weekly inspections as required by permit. New York goes the furthest and even has an approved material and equipment list that contractors can use in hopes of combating erosion as well as stormwater runoff. States also require training on erosion and sediment control for their contractors before starting a project. In addition to these measures states generally follow the National Pollutant Discharge Elimination System (NPDES) permit program to control water pollution from regulated discharges.

State Transportation Agency Survey	Five of six state respondents have not received audits from state regulatory agencies. Four of eight states have not been audited by EPA, and only one state has been contacted by EPA up to three times.
Day-Long Session with Barry Fagan, Alabama DOT	We are not a municipality, therefore we cannot regulate in the same way an MS4 can. Monitoring for construction is based on background data as reference. Focus for ALDOT will be on "priority sites" and rotate as needed to measure impact. Construction and maintainability should be considered in conjunction with cost. Larger projects have a pollution prevention plan, mostly for urban areas. No acre threshold unless defined by DOT. It is a key definition. One acreage threshold for reporting and regulation New or reconstruction activity – didn't want to have to put in post construction for retrofits on a mass scale. Definition of "construction" was negotiated. Design has to play a bigger role in implementation. If it's built into the plan, it is more likely to happen. Non-contracted construction activity also needs to be accounted for. Throw utilities in and you have an even bigger issue. Temporary controls are at risk. Maintenance definitions may be necessary (ditch cleanouts, signage, etc.)
June, 2014 Peer Exchange	From NDOR: ECODatabase • New Project Review Process • Inspection Reminders/Past Due Notices • New Reporting Features to Gauge Program Performance Utilities may be required for aligning municipal MS4s. BMPs required within state ROW. As long as DOT permit shows it is separate, utility contractors are responsible for acquiring their own permits for practices on state ROW for post construction.

October, 2014 Peer Exchange	Because of the unique conditions within a transportation agency MS4 program, it is imperative to educate the regulator on both what is possible and what elements of MS4 compliance require adjustment. Financial incentives and disincentives may include bidding and pay items, as well as punitive damages for corrective actions. Should a consent decree be enacted, all fines paid during the compliance phase go directly to EPA.

TABLE 8: SUMMARY OF MCM4 KEY FINDINGS FROM PROJECT DELIVERABLES AND ACTIVITIES.

For most transportation agencies, the progression to MS4 program implementation most often began with managing construction site erosion and sediment control concerns. While activities currently exist within Iowa DOT related to this MCM, this report recommends integrating comprehensive MS4 program strategies with both training and enforcement of construction-related environmental compliance.

Missouri DOT staff developed site-specific stormwater pollution prevention plans (SWPPP) based on general permit language, which encourages managing volume and flow velocity as well as erosion from constructions sites. In the development of this project, staff became evident of the need to "educate the regulator" on acceptable practices and setting expectations. In-house knowledge and expertise regarding erosion control practices can help navigate negotiations with those unaware of industry advancements.

Bid items, including both installation and maintenance, are key factors for erosion and sediment control practices. Iowa currently bids these items separately. Trust of contractor performance is critical for success. Assuming contractors are compliant with maintenance requirements, this appears adequate.

As a result of its EPA consent decree, Kansas has implemented a "disincentive program" for addressing contractor non-compliance. Fines of $1,500 per corrective action, per day, accrue on site for contractors. The amount increases to $2,500 after 10 days, with no exceptions. All funds paid are diverted to EPA until final settlement of the Kansas consent decree.

For several years, Nebraska Department of Roads (NDOR) has implemented a records management software for environmental compliance. Kansas Department of Transportation (KDOT) is developing a similar system. Data generated for all 6 MCMs is managed through this centralized system within the NDOR program. Records related to

inspections and corrective actions taken on construction sites are managed, as well as outreach, IDDE, post construction and good housekeeping activities. At the present time, the primary purpose of the KDOT system is to track construction compliance activity. Iowa DOT may consider a similar system as a means of streamlining information related to full MS4 program implementation.

MCM 5: Post-Construction Runoff Control

EPA Definition: Establishes methods and practices for MS4s, developers, and property owners to address stormwater runoff after construction activities have ended.

Summary of Key Findings: Table 9 lists a series of key findings related to MCM 5. To summarize, post-construction is often the least considered, yet most critical element of an MS4 program due to the permanence of the practices installed. Maintenance personnel require proper understanding of both the purpose and function of practices installed to manage runoff and/or reduce pollutant load. Integrated Roadside Vegetation Management (IRVM) is likely the most cost effective post-construction practice a transportation agency can implement. Emphasis on managing runoff volume may, in turn, result in overall pollutant load reduction. Ultra-urban sites may introduce unforeseen challenges regarding post construction practices and runoff management in locations where infiltration is impossible.

Source	Key Findings
MS4 Program Literature Review	For post construction runoff there was one common theme, which was the use of low impact development BMPs and maintenance of BMPs.
State Transportation Agency Survey	Limited information available.
Day-Long Session with Barry Fagan, Alabama DOT	Post construction and stormwater is typically an afterthought for most DOTs. Coordination is between design and construction. The goal is to get the process moving forward earlier. Focus on water quality and water quantity. Remove pollutants, mitigate hydrologic impacts. Filtration/infiltration practices. ALDOT is sticking to zero increase in peak discharge, managing 90% of runoff. According to Fagan, "[The permit] says we (ALDOT) have to mimic pre-development conditions; promoting low-impact development practices and green infrastructure versus ponds."

	Filtration practices – hardscaped concrete hydrodynamic separators (HDS), sand filters as possible options to consider. Leverage vegetation and benefits of already existing plantings in right-of-way (ROW). Soil Quality Restoration (Iowa Stormwater Management Manual) – If you have uncompacted soil, you will infiltrate the 1.25 inch rain event. Double it and you will handle the water quality volume for the entire ROW. Infinitely cheaper and more feasible than designed practices to be installed. HDS systems may be better suited for ultra-urban areas where the ability to infiltrate does not exist. *Maximum Extent Practicable* – mimic pre-development hydrology. Do a true, honest effort and defend it accordingly. If it is done in earnest, it should be acceptable to regulators.
June, 2014 Peer Exchange	MNDOT is working with University of Minnesota to get credit for water quality benefits of roadsides. A challenge with the state regulatory agency is they only grant credit for new practices and not anything that already exists. Post-construction program concerns • What do you treat? • How much do you treat? • Where? • When? • What counts? • What can be balanced in the project to allow for post-construction while in process? (basins, quadrants of interchanges, ultra-urban areas, etc.)
October, 2014 Peer Exchange	"Limit Impervious Surfaces" proves challenging when you're in the business of building roads and bridges. Siting post-construction practices – what can a transportation agency do? • Re-construction opportunities exist • Facilities design Manage Runoff VOLUME • Most pollutant load is captured • Proves challenging in ultra-urban settings

TABLE 9: SUMMARY OF MCM5 KEY FINDINGS FROM PROJECT DELIVERABLES AND ACTIVITIES.

As stated during one of the peer exchange sessions held as part of this project, the term "Limit Impervious Surfaces" proves challenging when you're in the business of building roads and bridges. However, opportunities do exist for post-construction stormwater management practices as facility construction occurs, as well as part of re-construction efforts.

The general recommendation for any transportation agency for post-construction stormwater management is to devote primary attention to runoff volume capture, treatment and management. By concentrating on runoff volume, most pollutants are in turn reduced and a quantifiable metric exists for annual number of gallons treated. Ultra-urban settings may limit treatment options for runoff management, storage and or infiltration. As a result, transportation agencies may consider volume mitigation and/or credit trading to ensure no net increase in volume to the adjacent water body.

Volume Mitigation may be established and structured similar to a jurisdictional wetland program, where comparable runoff volume management within a Hydrologic Unit Code (HUC) 8 or 13 watershed may occur. Scale may also be similar, with a 1:1 or 1:2 ratio for mitigation as a means of watershed enhancement.

MCM 6: Pollution Prevention/Good Housekeeping

***EPA Definition*:** Describes methods and practices for ongoing maintenance, observation and action to ensure or reduce negative impacts to waters of the U.S.

Summary of Key Findings: Table 10 lists a series of key findings related to MCM 6. To summarize, future planning for DOT activities should incorporate risk more than current approach. Because of limited resources, partnerships with other organizations are included in activities related to public involvement, engagement, and good housekeeping. Documentation should include plans and strategies that guide daily, ongoing activities and be included in annual training for all staff engaged in good housekeeping activities. Existing practices such as road salt monitoring, limited fertilizer application, spill response and other environmental compliance activities may also serve a dual purpose of MS4 good housekeeping activities. Facilities are recommended to adopt Facility Runoff Control Plans (FRCP) similar to the Nebraska DOR program as a means of ensuring environmental compliance at DOT facilities, particularly those located within other MS4 jurisdictions.

Source	Key Findings
MS4 Program Literature Review	Salt monitoring and low impact deicing methods were two common elements amongst the northern states for MCM6. Rhode Island even retrofitted existing sites with structural BMPs such as swirl chambers in storm drains, and implement new systems such as wetlands along highways. In New York, they limited fertilizer use and decreased their mowing patterns as well. Also many states stenciled drains with "no dumping" to hopefully decrease the amount of pollutants being dumped into sewers.

	Because of limited resources, partnerships with other organizations are included in activities related to public involvement, engagement, and good housekeeping. Leveraging of existing DOT programs such as the Adopt-a-Highway program, use of seasonal staff and interns, and pesticide applicator certification are considered compliance-based action Winter road maintenance and roadside vegetation management are listed as good housekeeping practices for most states.
State Transportation Agency Survey	Interdepartmental involvement is necessary both as a means of sharing resources and ensuring proper implementation.
Day-Long Session with Barry Fagan, Alabama DOT	Future planning needs to incorporate risk more than current approach. If you can create a stormwater feature that creates community value, it is success.
June, 2014 Peer Exchange	Mechanism for handing off to maintenance? Built in – documentation from Design, back to Environment. Into GIS tracking system, a form for treatment BMPs, maintenance related design guides. For NDOR, currently all post construction inspections are conducted in-house by the Environmental Division, who works with maintenance to get them up to speed and eventually hand off.
October, 2014 Peer Exchange	Facilities Runoff Control Plan (FRCP) – TS4 Alternative (Nebraska) • Facilities within existing MS4 communities • SWPPP for maintenance yard, in essence • Different from spill containment requirements • KS has requirements in manual, but no specific guidance. (Moving to NE model)

TABLE 10: SUMMARY OF MCM6 KEY FINDINGS FROM PROJECT DELIVERABLES AND ACTIVITIES.

De-centralization of DOT facilities, management and operations results in a series of challenges related to ongoing good housekeeping efforts for MS4 compliance. Individual districts manage systems autonomously, with Central Office guidance available as needed. For agency-wide MS4 compliance, District Office staff must also have consensus with both objectives and strategies toward full compliance with an agency-wide MS4 permit.

One method of implementing good housekeeping practices may be to adopt a Facilities Runoff Control Plan (FRCP) based on practices in place with NDOR. The Plan applies to agency facilities within existing MS4 communities, and serves as a SWPPP for maintenance yard, albeit as a different management approach from existing spill containment requirements. Kansas DOT is moving toward specific guidance based on the Nebraska model.

The FRCP exists as documentation of current practices related to the specific facility site, and related compliance components for the MS4 permit. The Plan exists on site, is reviewed by the facility, as well as central office. As part of the agency's comprehensive MS4 program, NDOR has incorporated the FRCP with its electronic records management software to inventory conditions related to physical plant, vehicles and equipment, product and material storage, bulk tank storage, and waste management practices. Monthly inspections are conducted by maintenance staff, with 3-year audits by the NDOR central office. The result is "closed loop accountability," for all involved in the process. By implementing the FRCP, NDOR has reduced the need for an industrial MS4 permit for facilities. While not currently a regulatory requirement, NDOR sees the benefit in centralized inspections, reporting and records management for environmental compliance. According to Ron Poe of NDOR, "All things applied to facilities are covered, regardless of regulatory need."

Winter road maintenance and chloride accountability are included as best practices for ongoing good housekeeping and MS4 compliance. Road kill maintenance and other incident reporting and response serve as proactive good housekeeping measures for environmental compliance.

Similar to the IDDE program component, good housekeeping efforts by a transportation MS4 can differ greatly from a municipality. Construction site compliance is often more easily understood, yet good housekeeping and maintenance are the more prevalent, ongoing activities. It is important to share information about existing good housekeeping practices not only with your regulator, but also with both internal and external stakeholders as a means of informing others on existing processes, and work toward improvement.

Impaired water bodies across Iowa list common pollution concerns as sediment, nutrients, lack of biological indicators and coliform bacteria. Iowa DOT may be listed as a contributor to waste load allocations (WLA) in total maximum daily load (TMDL) assessments written for Iowa's impaired water bodies. However, the ability for a transportation agency to reduce specific pollutant loads in lieu of volume may not be possible. As presented by Wisconsin DOT at the National Hydraulics Engineering

Conference, percentage of allocation may determine performance levels required by a transportation agency (2014). For example, if a transportation agency is listed as contributing one percent of a total load allocation, the agency may in turn dedicate resources to reduce its runoff volume, thereby its pollutant load, by one percent.

Other potential audit items for MS4 areas include assessment of existing training programs, spill containment (SPCC) compliance and response plans (if existing), ongoing maintenance records (including best management practice (BMP) maintenance), snow removal, and litter removal.

Organizational Structure: One Contact, One Permit

Rather than implement a distributed approach to MS4 program management, this report recommends Iowa DOT adopt a single environmental office or contact within the agency to oversee program implementation. Activities associated with MS4 program compliance will likely be distributed among various agency divisions. However, the responsibility of a designated office or individual contact for MS4 program compliance ensures overall organizational integrity and effectiveness. As stated previously as part of budgetary recommendations, staffing needs for initial implementation may span nearly eleven full-time employees (FTE), most of whom are existing staff.

While no new hires were indicated in the survey conducted as part of this study, the AASHTO report indicates a number of staff specifically allocated by state transportation agencies for MS4 compliance. NCDOT reported 15 FTEs, which is consistent with the greater number of DOT lane-miles that fall under jurisdiction of their permit. Texas reported three FTEs; two for Dallas and one for Fort Worth. The number of FTEs in other districts was not reported. Consultants utilized by Texas accounts for 10 FTEs. Of those 10 FTEs, the Dallas district uses one contract-derived FTE (based on $102,000 in consultant contracts) and the Fort Worth district uses 3 FTEs (based on $300,000 in contracts). WSDOT reports 14 FTEs, but they report that their consultant contracting is substantially changing, so FTEs from contracts could not be estimated. The number of WSDOT's FTEs seems high compared to the size of the DOT covered by the permit, but WSDOT is subject to a comprehensive permit that has extensive monitoring and Endangered Species Act (ESA) issues are likely an important cost driver in Washington. This makes comparison of FTEs among the DOTs difficult to interpret.

Table 11 summarizes key findings from the activities included in this project related to organizational structure. Limited information was generated from the initial literature

review, however the survey indicates most states operate under a general MS4 permit, with statewide MS4 permits encompassing all DOT properties and projects. Most compliance-related activity is limited to existing MS4-regulated areas and communities. Programs are managed by a mix of new and long-time staff, with a majority working on other tasks besides MS4 programming as part of their regular job duties. Outsourcing is common but not the norm for MS4 implementation.

The session with Barry Fagan included discussion of Division stormwater coordinators – working in each district as a stormwater specialist. In terms of permit compliance, these contacts may serve as the "qualified credentialed professional" (QCP) required to provide relevant information for permit reporting. Such individuals would report to a resident construction engineer (RCE), whose sole job is active construction compliance. Project inspectors should exist on each site. The Division stormwater coordinator would reviews reports, participate in training, and provide troubleshooting for compliance-related issues at a District level.

During the June peer exchange, other options for agency organization were discussed. While construction compliance activity may initially serve as a point of distributed responsibility, other agency division play equally critical roles in implementing a comprehensive stormwater program. For example, maintenance staff have equally important roles during the post-construction phase of projects. Construction activity is temporary, but road and right-of-way maintenance are constant, ongoing activities across the entire agency. A direct quote from Federal Highway Administration staff during the June peer exchange stated long-term maintenance is going to be the biggest issue for post construction management by transportation agencies.

One unique outcome of the June peer exchange was the discussion of inter-agency liaisons regarding MS4 program compliance. Minnesota DOT (MNDOT) maintains a liaison between DOT and the state Pollution Control Agency (PCA). This contact reviews permits for projects 50 acres or more in area which drain to impaired or water bodies with special state designation. MNDOT also maintains a liaison with the Department of Natural Resources (DNR) to streamline public waters permits as a combined role with jurisdictional wetland permit compliance. These fully-funded DOT employees helps streamline the compliance process and promotes efficiency.

The objective of the interagency liaison is to disseminate information and "identify pressure points" where collaboration and cooperation are necessary – "instead of adding more layers of bureaucracy."

By distributing activities across divisions, yet overseen by a central MS4 compliance contact, all six MCM requirements may be more effectively tracked and implemented

to ensure full program compliance. In addition, the designated point-of-contact provides both internal and external stakeholders a constant, reliable and common resource for information exchange. This includes regulatory contacts. As stated during the October peer exchange, one person negotiating a statewide transportation MS4 permit may not fully grasp the impact on other divisions. However, by working across divisions with designated representatives, ideally serving on an internal stormwater committee, the one point of contact may combine insights and activities across the entire agency to culminate in a comprehensive plan, permit and program.

As stated previously, the MS4 Strategy is about re-aligning existing activities to ensure both the acknowledgment of impact and a concerted effort of reduction, prevention and ongoing planning. Designating a single point of contact centralizes activities that occur in a distributed, decentralized manner. While numerous divisions may conduct activities relevant to MS4 program implementation, only one permit report is to be written and submitted. One entity, including the internal stakeholder committee, should be responsible for compiling all agency action relevant to and intended for MS4 compliance. Ultimately, someone must write the permit and submit reports.

The Permit: While Iowa DOT engages with 43 existing MS4 permit holders statewide, the activities occurring within DOT projects and facilities remains consistent in terms of road and bridge construction, highway maintenance and management of District Facilities. Table 11 summarizes permit-related information gathered as a part of this research project. As a result, this report recommends a single, agency-wide permit to address both activities within other MS4 communities, as well as part of District Facilities activities across Iowa.

Source	Key Findings
MS4 Program Literature Review	Limited information available.
State Transportation Agency Survey	Most states operate under a general versus individual permit. Statewide MS4 permits encompass all DOT properties and projects. Most activity is limited to existing MS4-regulated areas and communities. Programs are managed by a mix of new and long-time staff. A majority work on other tasks besides MS4 programming. MS4 program tasks are distributed across multiple staff for implementation. Outsourcing is common but not the norm for MS4 implementation. No new hires for MS4 management.

Day-Long Session with Barry Fagan, Alabama DOT	A good first step may be to assess/inventory existing MS4 community storm drain inlet/outfall data. No amount of money or personnel would allow us to comply as a co-permittee. If you have ROW within the jurisdictional boundaries, that city is likely to bring DOT in if they have regulatory issues with their own MS4. Division stormwater coordinators – working in each district as a stormwater specialist. Serves as the qualified credentialed professional (QCP). Reports to DCE, sole job is active construction. There are project inspectors on each site. The stormwater coordinator reviews reports, participates in training, troubleshooting, etc.
June, 2014 Peer Exchange	Erosion Control design is in same program as stormwater compliance in Nebraska. Roadway Design – five review points where plans are exchanged for review. Used to be housed in Roadway Design. Iowa DOT receives plans shortly before going to contractors. There is little time to effectively incorporate/recommend changes to plans for any given project. MN DOT has a liaison between DOT and PCA. Reviews permits >50 acres, and drains to impaired or special water. Also have a liaison with DNR to streamline public waters permits. Wetlands person is a combined role with the agency who regulates. It helps streamline the process – fully DOT funded positions. Interagency liaisons – MN. Key point person for related projects. Disseminates information, identifies pressure points – instead of adding more layers of bureaucracy. Streamlines DNR requirements for DOT processes. Has created BMP documents that are accepted by DNR and implemented by DOT. PCA liaison is trying to do similar things. Reviews/inspects sites "as a PCA person," prior to an actual PCA inspection. Construction is the most obvious, but other divisions of the agency (maintenance) play a critical role in implementing a comprehensive stormwater program. By being "in" construction (ND), the resistance comes more from the environmental side than the construction side of the debate. KDOT put the new position in the Office of Construction. That's where the money is and where the majority of the activity is located. Maintenance yards in ND have industrial MS4 permits. Long-term maintenance is going to be the biggest issue for post construction (FHWA)

October, 2014 Peer Exchange	One person negotiating a statewide transportation MS4 permit may not fully grasp the impact on other divisions.

TABLE 11: SUMMARY OF PERMIT-RELATED KEY FINDINGS FROM PROJECT DELIVERABLES AND ACTIVITIES.

According to a 2010 AASHTO study by Austin, there are two types of MS4 permits: individual and general. An individual permit is unique to each facility and/or permittee. The limitations and requirements contained in an individual permit are based on the permittee's operations, the type and amount of discharge, the receiving water bodies, and other factors. Individual permits often cover both stormwater and process water discharges. The Austin study conducted by Austin found the following permit structures for existing transportation MS4 programs:

- Twenty-seven state DOTs are covered by a statewide MS4 Phase II general permit (permittees may include the entire DOT, DOT districts, or the DOT within a specific region).
- Eleven state DOTs have DOT-specific individual permits (including combination MS4CGP permits).
- Five state DOTs are not covered by a NPDES permit.

With 43 existing MS4 permit holders already engaged with compliance efforts in Iowa, the concept of co-permitting within existing MS4 programs may be considered. However the outcome would likely prove challenging due to the volume of MS4 communities and uniqueness of local programming across Iowa. Iowa DOT would be required to comply with local MS4 ordinances, which may differ from city to city. While this may appear as a best-case solution in the short term, ongoing compliance issues with DOT activities in all 43 locations may require constant attention. As co-permittee, the municipality has management authority related to activities included in the permit. As stated by Barry Fagan during the one-day session with Iowa DOT, "No amount of money or personnel would allow {Alabama DOT} to comply as a co-permittee." By holding an individual agency permit, Iowa DOT maintains autonomy over activities occurring within MS4 communities. However, coordination with local MS4 contacts is paramount, due to the need to keep MS4 communities in compliance with their own permits and regulatory requirements. If local regulations are intended for greater environmental protection, DOT activities, while perhaps compliant with an agency permit, must also comply. Conversely, an MS4 community must not conduct activities within DOT management areas that may violate the requirements of the DOT permit.

Coordination with local MS4 permit contacts serves as a critical, ongoing need for an effective DOT MS4 program.

Refining implementation: Upon completion of the initial MS4 permit, Iowa DOT may then choose to incorporate performance measures, increase internal training to incorporate all six MCMs, and grow an agency-wide perspective on the objectives and consequences related to MS4 compliance. Program evaluation may require five or more years of implementation to measure success over time. As several peer exchange participants stated, the initial years of MS4 implementation consist of "intangible" progress. In other words, much work is done to merely assess the status of current activities. The second permit phase is more centered on implementing change.

Years 1-5: MS4 compliance should concentrate on establishing common language, definitions and standard practices. Program development may consist of inventorying existing efforts as a means of acknowledging and crediting current effort. Internal and external stakeholders should be identified and enlisted to participate in the MS4 program process. Initial efforts will likely revolve around Central Office activities, with years 3-5 including more statewide implementation and engagement with District Offices. Further training and audits may be included in the final year of the initial permit cycle, with plans to incorporate such accountability (i.e.: reporting) on a one, three and five year cycle.

Alignment Strategies

Two critical alliances should be considered as Iowa DOT advances toward an agency-wide MS4 program: engagement with existing MS4 permit holders, as well as engagement with local watershed projects as external, primary stakeholders. Currently, 41 municipalities and 3 universities in Iowa hold MS4 permits, and Dickinson County maintains a local ordinance for low-impact development requirements similar to municipal MS4 requirements. Figure 1 depicts the distribution of MS4 communities in Iowa. Consequently, Iowa DOT has 45 separate MS4 contacts to be coordinated as part of an agency-wide implementation strategy.

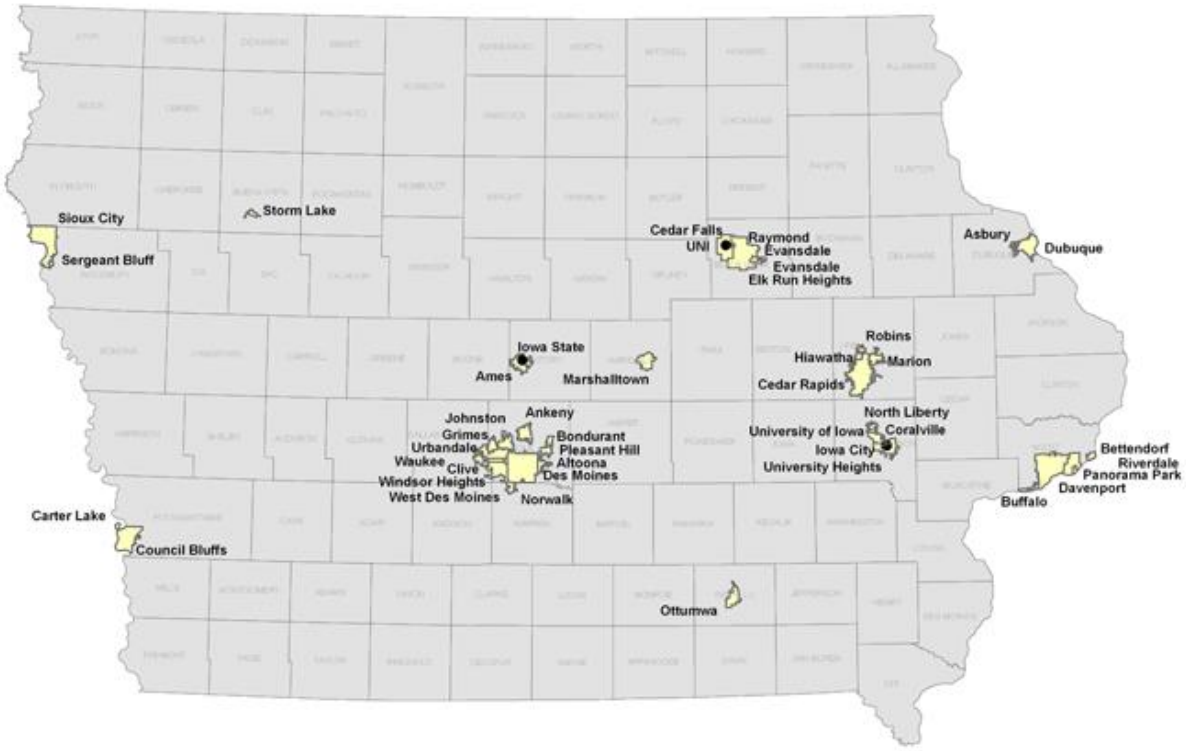

FIGURE 1: MS4 PERMIT HOLDERS IN IOWA. (SOURCE: IOWA DNR)

Table 12 lists the MS4 permit holders based on the respective DOT district offices. Districts 1 and 6 both contain sixteen MS4 communities and campuses each, with the remainder distributed among other Districts. Each District Office will likely incur unique circumstances related to local MS4 management, however on a whole, most municipalities have likely adopted local ordinances related to the six MCMs required by the Clean Water Act. In most instances, ordinances may be relatively similar, with exception to communities located within special or impaired water bodies. Examples may include Dickinson County for protection of the Okoboji Lake system; Dubuque for protection of local cold water trout streams, Carter Lake, for protection of the impaired lake system, and university campuses due to the concentration of impervious surfaces within the land each occupies.

MS4 Permit Holders by District

1	2	3	4	5	6
Altoona	Cedar Falls	Storm Lake	Carter Lake	Ottumwa	Asbury
Ames	Elk Run Heights	Sergeant Bluff	Council Bluffs		Bettendorf
Ankeny	Evansdale	Sioux City			Buffalo
Bondurant	Raymond				Cedar Rapids
Clive	Waterloo	Dickinson Co. - LID Ordinance			Coralville
Des Moines	University of Northern Iowa				Davenport
Grimes					Dubuque
Iowa State University					Hiawatha
Johnston					Iowa City
Marshalltown					Marion
Norwalk					North Liberty
Pleasant Hill					Panorama Park
Urbandale,					Riverdale
Waukee					Robins
West Des Moines					University Heights
Windsor Heights					University of Iowa

TABLE 12: MS4 PERMIT HOLDERS ORGANIZED BY IOWA DOT DISTRICT LOCATIONS.

Districts 1, 2 and 6 will also likely encounter "ultra-urban" conditions within the larger cities of Des Moines, Davenport, Cedar Rapids and Waterloo-Cedar Falls. Under such conditions, conventional stormwater management, erosion and sediment control, and good housekeeping practices may not be possible. Furthermore, DOT may co-manage roadways with municipalities, creating redundancy and potential conflict regarding respective MS4 permits. It is critical to engage with MS4 program staff within these MS4 communities to ensure proper coordination of effort and to verify neither party conducts activities which may cause the other non-compliance with an MS4 permit.

The Iowa Department of Natural Resources (DNR), in cooperation with the Iowa Department of Agriculture and Land Stewardship (IDALS), provide funding to local watershed projects in an effort to address water quality concerns for local water bodies. Figure 2 depicts the distribution of water quality projects across Iowa, in comparison with the location of MS4 communities. MS4 communities tend to cluster around major urban hubs. However, watershed projects vary by location.

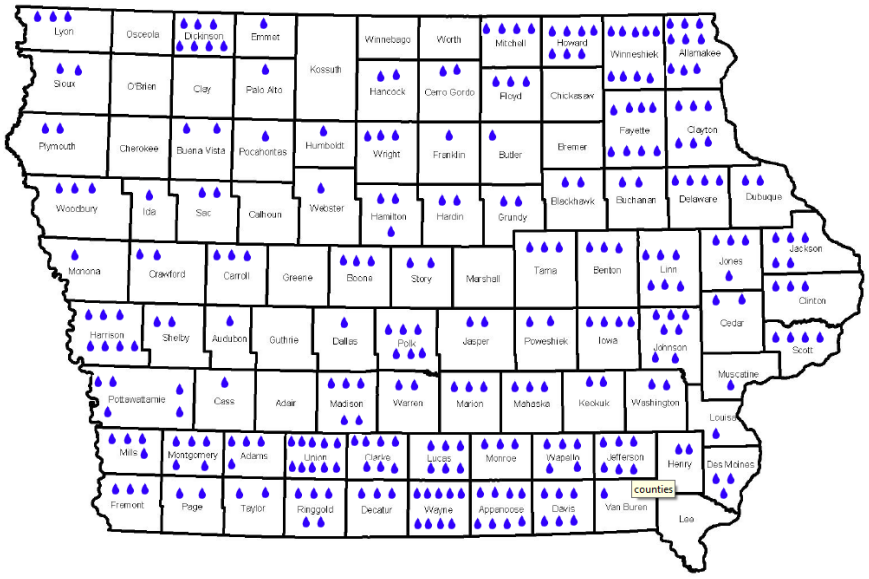

FIGURE 2: LOCATIONS OF WATERSHED MANAGEMENT PROJECTS IN IOWA. (SOURCE: IA DEPT. OF AG & LAND STEWARDSHIP)

The purpose of watershed projects also varies by location; with warm water stream protection, urban runoff, lake protection and flood protection as general categories. Within these categories, priorities include sediment, volume, nutrient and bacteria reduction, as well as protection of infrastructure from flood damage. Table 13 depicts the water quality concerns and related priorities.

	Priority 1	Priority 2	Priority 3
Warm Water Stream Protection	Sediment	Volume	Nutrients
Urban Runoff	Volume	Sediment	Nutrients
Lake Protection	Nutrients	Sediment	Bacteria
Flood Reduction	Infrastructure	Volume	Sediment

TABLE 13: WATER QUALITY PRIORITIES BASED ON LOCAL WATERSHED PROJECT GOALS.

When considering water quality concerns based on District Office location, projects can be categorized based on the location of watershed projects adjacent to MS4 communities. Table 14 lists existing MS4 activities within District Office locations, with regard for local watershed projects and water quality concerns. For District 1, priority is given to urban water quality concerns, warm water stream protection, and lake protection located primarily in the Des Moines metro area and adjacent counties. District 2 also focuses on urban water quality concerns and warm water stream protection, but also includes flood protection as a priority in Black Hawk County.

District 3 includes lake protection and urban runoff management projects in Buena Vista and Dickinson Counties, as well as flood reduction projects in Woodbury County. Pottawattamie County manages warm water stream protection and flood reduction projects within District 4. Five watershed projects exist in District 5, while only one MS4 community exists in the District. Emphasis is primarily on flood reduction and warm water stream protection for adjacent drinking water sources in the county. District 6 contains several urban hubs such as Cedar Rapids, Davenport, Dubuque and Iowa City. As a result, urban runoff and warm water stream protection are priorities, as well as lake protection.

Dist.	Counties containing MS4 Communities	MS4 Count	Watershed Projects	Water Quality Concerns
1	Polk, Story, Marshall, Dallas, Madison, Jasper	16	16	Warm water stream protection, urban runoff, lake protection
2	Black Hawk	6	2	Warm water stream protection, urban runoff
3	Woodbury, Dickinson, Buena Vista	4	12	Lake Protection, urban runoff, flood reduction
4	Pottawattamie	2	5	Warm water stream protection, flood reduction
5	Wapello	1	5	Flood reduction, warm water stream protection
6	Linn, Johnson, Dubuque, Scott	16	19	Urban runoff, warm water stream protection, lake protection
	Total Count:	**45**	**59**	

TABLE 14: COMPARISON OF MS4, WATERSHED AND WATER QUALITY CONCERNS WITHIN DOT DISTRICT AREAS.

This report recommends Iowa DOT consider both MS4 community locations, as well as local watershed projects as a means of proactively engaging with local stakeholders. Furthermore, construction, post construction, IDDE and good housekeeping practices may directly impact conditions currently monitored and prioritized by local watershed managers. By including these stakeholders in both the development and implementation of an agency MS4 program, Iowa DOT grows the potential for partnership and reduces the potential for adversity.

Budgeting Considerations

Overview: Compliance with an effective MS4 program and permit requires appropriate funding and agency support. At present, very few transportation agencies adequately fund compliance efforts related to MS4 programming. In many instances, costs are bundled with other project expenses, making actual cost estimations challenging to calculate. An estimation for total program compliance for an agency-wide MS4 program, based on survey data, feedback from peer exchange sessions, and literature reviewed as part of this research, recommends dedicating four to five percent of overall project costs for a calendar year to cover erosion and sediment control compliance for construction-based activities. However, other MS4 program requirements should also be included in annual agency budgets.

Given the long-term maintenance and performance costs associated with post-construction practices, it is critical to ensure final site stabilization takes post-construction requirements for an MS4 permit into account. In many ways, this can include repurposing existing practices such as Integrated Roadside Vegetation Management (IRVM) to ensure native vegetation in right-of-way (ROW) promotes infiltration and a reduction in stormwater volume. Education and outreach activities may incorporate existing marketing and communications initiatives within the overall agency strategic plan. However, special effort must be made to not only include language specific to MS4 program goals, but also to establish messaging and branding that is appropriate for both primary and secondary audiences targeted for MS4 program compliance purposes.

Table 15 summarizes key findings from this study regarding budgetary considerations. Limited information exists in online literature and resources directly sourced to transportation agencies. This may be due to the complicated nature of assigning specific values to large-scale project budgets. The multi-state survey indicated most states are not funding MS4 compliance efforts adequately. Only one agency indicated more than $500,000 in annual support for overall program management. The day-long session with Barry Fagan concentrated primarily on budgetary considerations for erosion and sediment control efforts. Fagan mentioned construction stormwater costs for ALDOT is three to five percent of total project budgets for temporary controls only. Initially, ALDOT budgeted one to two percent of project costs. For special projects, such costs could increase to 10-15 percent. The June, 2014 peer exchange included discussion of a mitigation fund established by Colorado DOT as a result of a compliance order of consent from the Colorado Department of Public Health and Environment – Water Quality Control Division. This fund totals approximately $6.5 million in annual funds,

with 80 percent awarded on the average each year to projects based on recommendations from an appointed committee. The peer exchange discussion of budgeting concentrated heavily on the punitive damages incurred by the Kansas DOT due to noncompliance for erosion and sediment control, and the consent decree issued by the U.S. Department of Justice.

Source	Key Findings
MS4 Program Literature Review	Limited information available.
State Transportation Agency Survey	$0 to $25,000 typical for implementation of individual MCM activities. Only one agency indicated more than $500,000in annual support for overall program management. If tasks are distributed across multiple staff, actual costs need to factor in percentages of all FTE involved. (Potentially five or more individuals) Most agencies are not comprehensively funding MS4 compliance.
Day-Long Session with Barry Fagan, Alabama DOT	Construction stormwater costs for ALDOT is 3-5% of total project budget on temporary controls only. This is an increase from initial estimations of 1-2% of project budgets. Special projects could increase to 10-15%.
June, 2014 Peer Exchange	Mitigation Fund - Colorado • $6.5 million • Not spent on maintenance (was not factored in initially) – design/construction only • 80% spent on three year rolling average • Committee comprised to manage funds, select projects, initial call for projects (internal/external)
October, 2014 Peer Exchange	Kansas DOT has incurred more than $2 million in violations since the initial consent decree. More fees are pending.

TABLE 15: SUMMARY OF BUDGETARY INFORMATION GATHERED FROM PROJECT DELIVERABLES AND ACTIVITIES.

Recommendations

Based on estimated values for implementing all six Minimum Control Measures (MCMs) for an agency-wide MS4 Program, a total annual budget of $1,312,745 includes a mix of new and existing funding to both staff compliance activities and promote full implementation of a transportation agency MS4 permit. Full-time employee expenses (FTE) of $75,900 per year are based on an averaged amount of wages and fringe benefits for entry-level, intermediate and senior-level employees of the State of Iowa, as reported by the Department of Administrative Services (DAS) online salary database. Project expenses are based on estimated costs for resources and materials necessary to implement given tasks.

In many instances, these initial costs may be reduced over time. For example establishing branding and messaging may require effort every one to five years, rather than on an annual basis. However, erosion and sediment control costs do occur annually, as do post-construction and good housekeeping activities as a maintenance activity.

Please note that larger versions of the tables 16 and 18 for timeline and budget are included as appendices at the end of this report. For the sake of conserving space, smaller versions were included in the report body as a reference.

MCM1 - Outreach & Education: $235,850 budgeted for development appropriate external messaging and branding for DOT as an MS4. This also includes funding for staff time and project dollars to determine priority areas for MS4 program-specific activities. This may include formalizing relationships and agreements with existing MS4 communities and permit holders statewide, developing 28-E agreements to establish maintenance and good housekeeping strategies, formal district office agreements with local or county government, and other activities that formalize the working relationship between Iowa DOT and other MS4 permit holders, or government agencies located where Iowa DOT facilities exist. One formal partnership also recommended is the establishment of an MS4-related memorandum of understanding (MOU) for combined training opportunities with the Iowa Chapter of the Association of General Contractors (AGC). Because this organization represents the largest body of contractors engaged in construction work on Iowa DOT projects, the potential exists for expanded education and outreach, thereby increasing awareness levels of both contractors and supervisors engaged in activities regulated under the MS4 permit. Through such a formal agreement, Iowa DOT may share updates and changes to regulatory requirements, as well as educate contractors on the fundamental elements of the MS4 permit. This may foster greater understanding of the purpose and justification for new and existing

regulations for construction site erosion and sediment control. Furthermore, it provides AGC with a voice in how the program operates, and represents a collective body of individuals directly impacted by the requirements of the MS4 permit, thus facilitating public involvement. Measures of success can be based upon deliverables established as a result of these activities.

MCM2 - Public Involvement: $112,105 is budgeted for staff and projects related to public involvement in the transportation agency MS4 process. Specific activities include establishment of both an internal and external committee. Because it is important for committee meetings to focus specifically on the unique needs of internal and external stakeholders, two separate committees are recommended. An internal committee may include stakeholders from different agency divisions, levels of management, outreach and communications staff, engineering and planning, as well as hydrology and bridge staff. External committee members may include county and local government contacts, contractors, representatives from local watershed groups, and other state or federal government agencies engaged with Iowa DOT for non-regulatory purposes. Measures of success would include meeting minutes as a note of record, as well as goals and objectives established by the committees as each is accomplished by the agency. The Adopt-a-Highway program, which exists in nearly all states nationwide, serves as an existing activity that accomplishes public involvement activities necessary to fulfill an MS4 permit requirement. Litter and debris pollute water bodies, but can be more easily removed than other pollutants such as sediment, nutrients and bacteria. By engaging volunteers on a regular basis, Iowa DOT may provide a quantifiable metric to fulfill MCM2. Lastly, a point person needs to be designated to coordinate outreach and involvement efforts. While such activities may appear more efficient by distributing among existing staff, a designated "responsible party" will ensure meetings occur and are properly documented; activities involving stakeholders and partners are both quantified in terms of accomplishments as well as attendance. Stakeholders benefit from having a single point of contact, and person of reference when referring to MS4 program activities, and person-to-person contact with a designated staff member also grows trust among the agency from ongoing relations.

The staff person may conduct both outreach and involvement activities, thereby increasing efficiency. However, this report recommends a separate individual from those required to implement other MS4 program requirements mange outreach and education efforts. Staff with training and experience in public outreach, communication and marketing may already exist within Iowa DOT, and may be ideal resources for developing appropriate materials and activities to engage with the public.

MCM3: Illicit Discharge Detection & Elimination (IDDE): $168,940 is budgeted for activities related to discharge detection, proactive monitoring and risk management for potential discharges from DOT facilities. Activities include coordination of a drain and inlet mapping system as one of the first activities to engage in during the MS4 implementation process. Because existing MS4 permit holders across Iowa have been actively implementing program requirements since 2003, there is a greater likelihood that storm drain and inlet maps within MS4 communities include discharge points from DOT right-of-way (ROW). DOT may avoid redundancy by sharing information with MS4 communities, and enhancing existing maps as new road projects occur. Once outfalls and inlets are assessed, it is recommended to designate approximately 20 percent of outfalls as "priority" areas for scheduled and ongoing visual inspection. Prioritization may be established by both internal and external stakeholder committees as a means of determining both the risk of potential discharges to specific water bodies, as well as the level of response required by DOT. Being a transportation agency, the majority of risk related to spills occurs on roadways, often due to accidents and unplanned activities not involving DOT staff. A phone-based and online reporting system should be available to the public to report illegal spills, dumping and litter. A Spill Management Response Plan verifies a planned response on Iowa roadways, as well as within DOT facilities. As an agency, Iowa DOT cannot control when accidents involving spills occur on the road. However, the agency can prepare to properly respond. Such plans may currently exist, but require updating for the purpose of MS4 compliance.

MCM4: Construction Site Erosion & Sediment Control (ESC): $302,250 is budgeted for both staffing and project dollars related to erosion and sediment control compliance. Please note, this amount does NOT include costs related to specific practices installed and maintained on active construction sites. Rather, the budget accounts for expansion of existing training to incorporate MS4 goals & objectives, thereby integrating erosion and sediment control practices with an overall agency strategy for program compliance. Construction related activities included in the MS4 permit differ greatly from outreach and spill response activities occurring within DOT roadways, therefore it is recommended a separate individual serve as the contact for construction-based compliance versus illicit discharge compliance. This individual may also serve as a point-person to coordinate with existing MS4 permit holders and communities on construction-related compliance. Activities related to this role may include project meetings to share ESC plans with local stormwater management and watershed management contacts, generating feedback for projects in priority areas, and coordinating ESC activities to leverage local resources to ensure protection of environmentally sensitive areas. This may also be considered outreach and education, however the activities would complement a more comprehensive outreach and

engagement strategy as defined by Iowa DOT. The majority of expenses budgeted for MCM4 compliance are to develop an inspection/compliance/response database for efficient record keeping and reporting. This project may expand the scope of existing records management systems, or consist of an entirely new database and reporting system to streamline records, ensure access to information for all internal stakeholders, and track response activities to ensure effectiveness.

MCM5: Post Construction: $200,235 is budgeted for post-construction activities related to MS4 program compliance. Post-construction activities, by definition, occur after the site is no longer under construction. As demonstrated in survey data, literature and peer exchange feedback, this component is often grossly under-funded and overlooked due to the ongoing nature and relative expense. Iowa has served as a leader in Integrated Roadside Vegetation Management (IRVM) since 1989, with thousands of roadside prairie plantings acting as natural filters and infiltration systems for roadway runoff. Iowa DOT should require IRVM in all practicable instances after final grading as a cost-effective means of implementing post-construction MS4 compliance. Because maintenance staff have a primary role in post construction activities, annual training is recommended for District Maintenance Staff on MS4 programming, and the purpose of managing runoff for water quality. A measurable goal for post construction compliance may also include runoff reduction goals for DOT facilities.

MCM6: Good Housekeeping: $293,365 is recommended for establishment of strategic plans, the actual MS4 permit for Iowa DOT, and a Facilities Runoff Control Plan (FRCP) similar to the plan developed by Nebraska Department of Roads (NDOR). Once established, costs for plan implementation may be reduced over time. However, the intent of good housekeeping as a minimum control measure ensures the spirit of collective understanding and application of safety measures intended for water quality protection. Just as all staff have general agreements and understanding of safety measures to prevent personal injury, good housekeeping measures are meant to promote an agency-wide approach and understanding of the commitment to reducing the hydrologic footprint and impact to water quality as a result of DOT activities. Similar to coordinated efforts underway in Nebraska and Alabama, Iowa DOT can coordinate all environmental permits, programs and initiatives under the umbrella of an agency-wide MS4 program, as defined by a permit, to verify a commitment to environmental quality.

Rationale

Funds recommended in this MS4 Program Implementation Budget are for initial expenses over an 18-month compliance period. Similar to the ALDOT approach, the process scope spans from inception to implementation. The time table begins with Month One: where activities begin toward compliance. Table 16 provides a graphical depiction of the timeline based on the budget narrative. Development of the MS4 permit itself is included in this calendar, however activities are recommended to commence prior to the approval of the DOT MS4 permit. By taking the initiative to comply prior to permit approval, Iowa DOT demonstrates a proactive approach to compliance. While negotiations with regulatory agencies may require further action, these initial steps serve as a practical, gradual approach to full MS4 program implementation.

Activities listed include several with asterisiks (*) as assumptions that existing Iowa DOT activities may be leveraged for MS4 compliance. However, an extensive internal inventory of ongoing agency activities was not included as part of this research. Rather, it was suggested during the June peer exchange as an initial step when other state agencies such as NDOR established the content of an initial MS4 permit and program. As a result, this report also recommends Iowa DOT inventory existing programs more thoroughly to determine opportunities to incorporate MS4 compliance as part of the initial plan development process, which is listed in the project timeline as an activity for MCM6: Good Housekeeping.

Similar to the findings of the AASHTO study, the survey conducted as part of this MS4 Strategy development process concludes most programs have common elements that derive from the Phase I/II required minimum measures, such as public education and outreach, illicit discharge tracking and elimination, new development and redevelopment, inventory and mapping of storm drain facilities, maintenance, inspections, and reporting. All permits generally require program development including development of a program plan and program evaluation. Program requirements tend to differ in the extent of monitoring required, the extent to which mapping and other supporting database development is required, the extent to which supporting technical guidance and manuals are required, the scope and sophistication of monitoring requirements, the requirement to adopt a retrofit program, and special conditions associated with impaired waters and TMDL allocations. It is reasonable to expect such program elements to be included and appropriately funded for a properly functional MS4 program for Iowa DOT.

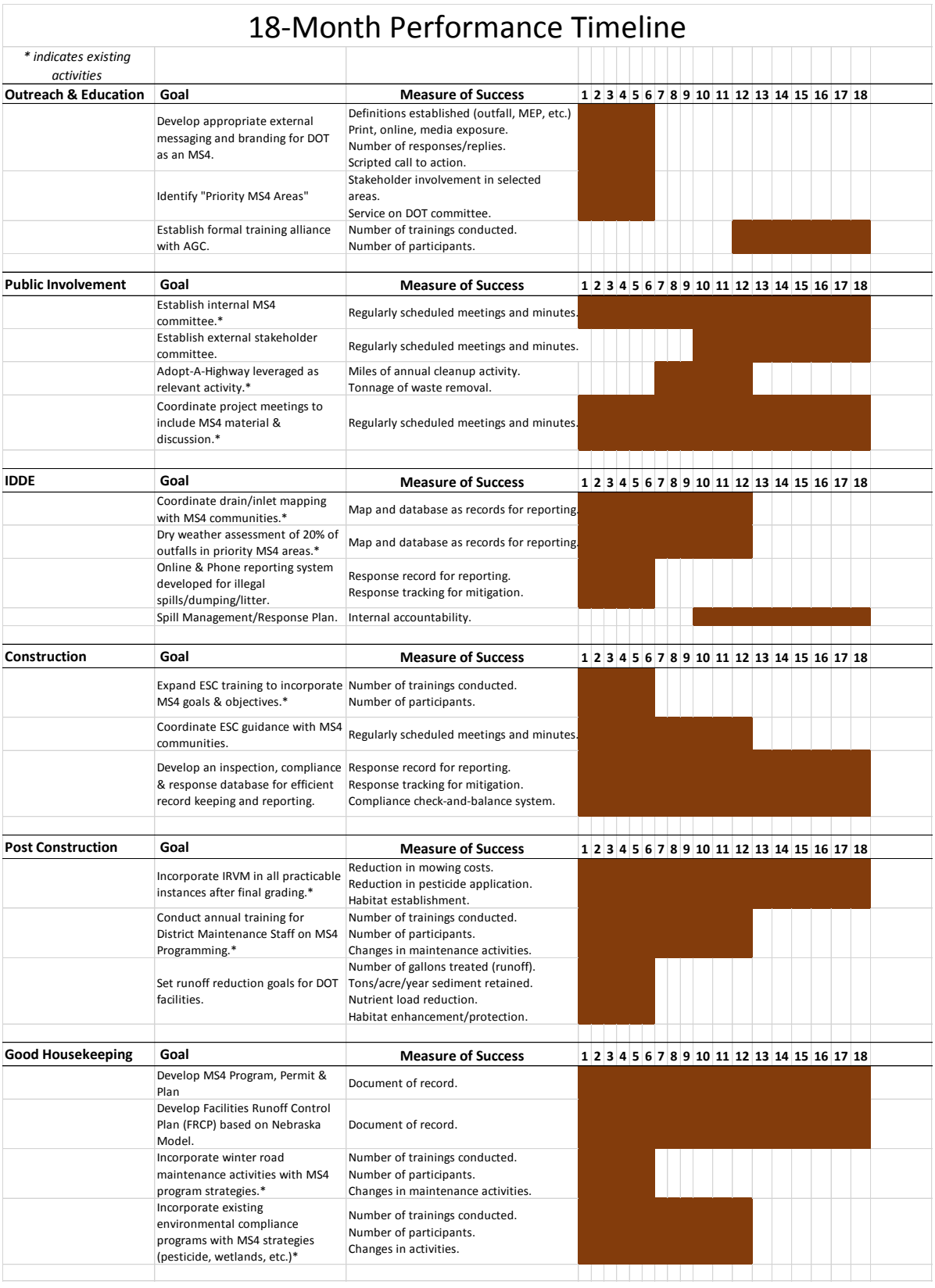

TABLE 16: RECOMMENDED 18-MONTH PERMIT DEVELOPMENT AND IMPLEMENTATION CYCLE.

The ratio of new to existing resources is listed in Table 17, with an estimated as a 70/30 percent ratio, suggesting Iowa DOT invest $962,865 in new dollars to initiate MS4 program implementation. Approximately $349,880 in existing staff and project dollars may be repurposed to include MS4 compliance with existing activities. The budget represents an 18-month timeline to completion, averaging $875,163 over a 12-month period for annual fiscal year (FY) budgeting. After an initial investment, Iowa DOT may anticipate a reduction in costs by 15 percent per year over three years, resulting in an annual operating budget of $806,190 by the fourth year of implementation.

	FTE Expenses	Project Expenses	Total Expenses
Total Expenditures	$ 785,565	$ 527,180	$ 1,312,745
Existing Expenditures	$ 216,315	$ 133,565	$ 349,880
"New" Expenditures	$ 569,250	$ 393,615	$ 962,865
Ratio: New to Existing	0.72	0.75	0.73

TABLE 17: COMPARISON OF EXISTING AND NEW PROGRAM EXPENDITURE VALUES.

Table 18 outlines the budget details based on MCMs, staffing and project-related expenditures. Existing activities are marked with an asterisk (*). Staffing needs for initial implementation span 10.6 full-time employees (FTE), likely consisting of existing staff. Responsibilities may be divided among one to two communications staff, one planning staff, one construction staff, two to three staff representing construction engineering, and no fewer than three staff representing District Maintenance Facilities. Time commitments for staff will vary based on activities. For example, communications staff may incorporate MS4 involvement with existing programs and projects. Facilities and maintenance crews should receive training to incorporate an ongoing approach and perspective to daily activities that takes MS4 management into account. Designers and planners should have post-construction runoff management goals included in ongoing activities, and other environmental compliance contacts should incorporate an MS4-related strategy with existing activities.

In many ways, the MS4 Strategy is about re-aligning existing activities to ensure both the acknowledgment of impact and a concerted effort of reduction, prevention and ongoing planning. As staff turnover occurs, job descriptions for new and replacement hires should include duties and activities aligned with agency-wide MS4 program goals. In addition, contracts and partnerships with external agencies, contractors and individuals should include language that takes MS4 management into account. As a result, both accountability and quantifiable metrics exist to be included in future permit reports.

18-Month Performance Goals & Budget					
	Anticipated Budget:	$ 1,312,745			*indicates existing activities
Outreach & Education	**$ 235,850**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Develop appropriate external messaging and branding for DOT as an MS4.	0.65	$ 49,335	$ 85,000	Print, online, media exposure. Number of responses/replies. Scripted call to action.
	Identify "Priority MS4 Areas"	0.35	$ 26,565	$ 12,000	Stakeholder involvement in selected areas. Service on DOT committee.
	Establish formal training alliance with AGC.	0.5	$ 37,950	$ 25,000	Number of trainings conducted. Number of participants.
		SUBTOTALS:	*$ 113,850*	*$ 122,000*	
Public Involvement	**$ 112,105**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Establish internal MS4 committee.*	0.15	$ 11,385	$ 10,000	Regularly scheduled meetings and minutes.
	Establish external stakeholder committee.	0.25	$ 18,975	$ 10,000	Regularly scheduled meetings and minutes.
	Adopt-A-Highway leveraged as relevant activity.*	0.15	$ 11,385	$ 10,000	Miles of annual cleanup activity. Tonnage of waste removal.
	Coordinate project meetings to include MS4 material & discussion.*	0.4	$ 30,360	$ 10,000	Regularly scheduled meetings and minutes.
		SUBTOTALS:	*$ 72,105*	*$ 40,000*	
IDDE	**$ 168,940**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Coordinate drain/inlet mapping with MS4 communities.	1	$ 75,900	$ 25,000	Map and database as records for reporting.
	Dry weather assessment of 20% of outfalls in priority MS4 areas.	0.15	$ 11,385	$ 5,500	Map and database as records for reporting.
	Online & Phone reporting system developed for illegal spills/dumping/litter.*	0.25	$ 18,975	$ 10,000	Response record for reporting. Response tracking for mitigation.
	Spill Management Response Plan*	0.25	$ 18,975	$ 22,180	Response record for reporting. Response tracking for mitigation.
		SUBTOTALS:	*$ 106,260*	*$ 62,680*	
Construction	**$ 302,250**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Expand ESC training to incorporate MS4 goals & objectives.*	0.5	$ 37,950	$ 15,000	Number of trainings conducted. Number of participants.
	Coordinate ESC guidance with MS4 communities.	1	$ 75,900	$ 12,500	Regularly scheduled meetings and minutes.
	Develop an inspection/compliance/response database for efficient record keeping and reporting.	1	$ 75,900	$ 85,000	Response record for reporting. Response tracking for mitigation. Compliance check-and-balance system.
		SUBTOTALS:	*$ 189,750*	*$ 112,500*	
Post Construction	**$ 200,235**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Incorporate IRVM in all practicable instances after final grading.*	0.65	$ 49,335	$ 40,000	Reduction in mowing costs. Reduction in pesticide application. Habitat establishment.
	Conduct annual training for District Maintenance Staff on MS4 Programming.*	0.5	$ 37,950	$ 15,000	Number of trainings conducted. Number of participants. Changes in maintenance activities.
	Set runoff reduction goals for DOT facilities.	0.5	$ 37,950	$ 20,000	Number of gallons treated (runoff). Tons/acre/year sediment retained. Nutrient load reduction. Habitat enhancement/protection.
		SUBTOTALS:	*$ 125,235*	*$ 75,000*	
Good Housekeeping	**$ 293,365**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Develop MS4 Program, Permit & Plan	0.5	$ 37,950	$ 45,000	Document of record.
	Develop Facilities Runoff Control Plan (FRCP) based on Nebraska Model.	0.5	$ 37,950	$ 45,000	Document of record.
	Incorporate winter road maintenance activities with MS4 program strategies.	0.35	$ 26,565	$ 12,500	Number of trainings conducted. Number of participants. Changes in maintenance activities.
	Incorporate existing environmental compliance programs with MS4 strategies (pesticide, wetlands, etc.)	1	$ 75,900	$ 12,500	Number of trainings conducted. Number of participants. Changes in activities.
		SUBTOTALS:	*$ 178,365*	*$ 115,000*	
		Total Budget:	**$**	**1,312,745**	

TABLE 18: RECOMMENDED 18-MONTH PERMIT DEVELOPMENT AND PROGRAM IMPLEMENTATION BUDGET.

Transportation MS4 Concept

During both the day-long session with Barry Fagan and the two peer exchange sessions as part of this project, discussion often migrated to the concept of a non-municipal MS4 approach to environmental compliance, namely a "T-S4" to support the goals and objectives of transportation agencies. For Alabama DOT, development of the initial MS4 permit proved daunting due to requirements tailored primarily for municipal government entities. According to Fagan, it became evident ALDOT did not have the same regulatory authority as a municipality, and full compliance with a municipal MS4 permit was not feasible.

As part of the negotiating process with its regulator, ALDOT refused to agree on paper to requirements that "we are incapable of doing." Examples of MS4 permit requirements not possible for transportation agencies include passage of local ordinances, sewer networks that span entire cities, and leading education efforts that target general citizen behavior. Principles of the ALDOT MS4 were based on three tenets:

- We are not a municipality and we refuse to be regulated as such.
- Will not agree to do anything we are unable to do.
- We are interested in our environmental impacts, and we are willing to do what needs to be done.

The general definition of MS4 does not fit transportation agencies well. It is intended to address pollutants from urban areas. However, because transportation agencies operate in urban areas, and inherently connect metropolitan hubs by way of impervious surfaces, transportation agencies own, occupy and operate on land within these urban areas. While existing language within MS4 regulatory language may require more attainable alternatives for non-municipal capabilities, transportation agencies do have environmental responsibilities related to ongoing operations. Transportation agencies engage in activity that risks environmental impact. As public agencies, there is also an expectation to honor and address as community members and resources.

AASHTO and FHWA reports have mentioned and recommended the concept of a TS4, however national implementation was considered infeasible. Alternative program components must exist to compliment the regulatory requirements not possible by non-municipal entities. Alternatives to ordinances and civil fines need to be established. Environmental groups and public stakeholders may be enlisted to guide this process. In doing so, these entities may also be educated on the function and need for alternative compliance, as well as fundamental limitations of a transportation MS4.

Challenges with Linear Construction: Unlike construction in municipal areas, linear construction follows the roadway, with limited space on either side for both environmental protection and construction activity. Dozens of discharge points may exist on multiple-mile projects, and phasing may take several years to complete. Furthermore, the order and magnitude of construction, maintenance and facility management greatly surpasses the scale of private sector development. General contracts may exist with multiple contractors for both active and post construction activities. Easements and adjacent land run-on concerns further complicate compliance issues, as landowners and watershed management become more prevalent in DOT projects. By the very nature of bridge and culvert projects, construction and maintenance occur within water bodies. Because of these characteristics unique to transportation agencies and not municipalities, language within a transportation agency MS4 permit may require adjustment or alternative language to ensure compliance.

When considering T-S4 components in respect to the 6 MCMs, each contains alternative programming which may both comply with regulatory requirements, and also provide environmental protection on behalf of the transportation agency permit. Table 19 summarizes these unique characteristics of non-municipal MS4 programs, many of which have been addressed throughout this report.

Education, outreach and involvement activities may better suit a transportation agency by targeting specific stakeholders and audiences. This includes training activities, assessing and measuring actual change in perceptions and attitudes, as well as engagement with regulatory agencies to establish reporting requirements, and expectations regarding report content.

MCM	**Non-Municipal Capacities/Capabilities**
Outreach/Ed	Primary/Secondary audiences Assessing and measuring relative change based on activity for both "publics" 1, 3, 5 year reporting cycles for interagency communication
Involvement	Statewide Scope vs. single municipality (we work with them all) Training has specific focus/objectives Entirely different organizational structure
IDDE	Document existing processes for pollution prevention, spill containment, response Scope and scale of discharge points for a statewide system versus a municipality
Construction	Timelines may span multiple years for projects. Traffic must proceed through active sites. Limited footprint for construction and compliance activities.

	Linear extent provides additional challenges not present for single parcel construction.
Post Con	Limited space for LID. Focus on volume management versus specific pollutant reduction. Promote concept of mitigation to address ultra-urban runoff concerns.
Good Housekeeping	Nebraska Facility Runoff Control Plan as model. IRVM

TABLE 19: RECOMMENDED ALTERNATIVE COMPONENTS FOR NON-MUNICIPAL COMPLIANCE WITH MS4 REGULATIONS.

IDDE activities for transportation agencies are fundamentally different from municipal MS4 communities. Coordination with MS4 communities provides a more feasible approach to assessing discharge points versus mapping the entire state road system. In addition, spill management and containment from roadway incidents and facility sites indicates active pollution prevention. By establishing an online and phone based reporting system, public involvement also occurs as a result of TS4 IDDE activities.

Table 20 recommends alternative program components for non-municipalities to comply with MS4 permit requirements. Construction, post-construction and good housekeeping activities either occur along the state road system and right-of-way, or within DOT facilities. Unlike municipalities, this system is distributed statewide, and occupies hundreds of thousands of acres. It is an unreal expectation to require staff of a transportation agency to monitor activity similarly to a municipal employee who is able to span an entire city to inspect sites over the course of hours, days or weeks. However, alternatives do exist.

Because many contractors work on multiple projects, there is opportunity to train contractors on content specific to DOT requirements for both active and post construction. The DOT Maintenance Division may implement an agency-wide training and outreach program specific to MS4 requirements. DOT engineers and contracted designers may be required to include volume reduction practices as components of all future projects. Facilities may include runoff volume and pollutant management practices to demonstrate applicability and educate the public on the function and purpose. One example may be to incorporate runoff reduction practices at rest areas, and include signage to inform visitors of both the function and purpose of the practice. As a large-scale post-construction and good housekeeping initiative, Iowa DOT may consider statewide adoption of IRVM practices as a means of complying with MS4 permit requirements in a suitable manner for a transportation agency.

Existing Permit Question	Possible Alternative Permit Question
Do you have an ordinance or other regulatory mechanism stipulating: Erosion and sediment control requirements?	Do you provide training, certification and accountability requirements for staff and contractors responsible for erosion and sediment control practices as part of your construction program?
Have you completed a map of all outfalls and receiving waters of your storm sewer system?	Are the discharge points from priority DOT locations mapped? What criteria are used to determine priority locations? (i.e. Impaired water bodies, watershed projects, stakeholder engagement, etc.)
Identify the number of outfalls in your storm sewer system.	What is the volume discharge associated with DOT facilities and ROW based on impervious surface and hydrologic calculations?
What is your frequency for screening outfalls for illicit discharges?	What are the contents of your annual Spill Management/Response Plan? How often is this updated? Provide the results of phone and online reporting system.
Have stormwater pollution prevention plans (or an equivalent plan) been developed for: All public parks, ball fields, other recreational facilities and other open spaces	Develop a Facilities Runoff Control Plan (FRCP) that coordinates existing environmental regulatory compliance with MS4 compliance needs.
Do you have an ordinance or other regulatory mechanism to require: Site plan reviews for stormwater/water quality of all new and re-development projects?	Establish a formal process within project development, review and implementation to incorporate MS4 compliance from beginning to end.
What are your criteria for determining which new/re-development stormwater plans you will review (e.g., all projects, projects disturbing greater than one acre, etc.)	Establish and identify MS4 compliance team to review and approve projects based on regulatory compliance needs for all DOT projects.
How many privately owned permanent stormwater management practices/facilities were inspected during the reporting period?	Develop a strategy with Maintenance for consistent, ongoing efforts to ensure proper functionality of post-construction practices.

TABLE 20: RECOMMENDED ALTERNATIVE COMPONENTS FOR NON-MUNICIPAL COMPLIANCE WITH MS4 REGULATIONS.

Migration to a TS4 program will likely also require educating regulatory agencies on the conceptual framework. Should Iowa DOT choose to consider TS4-appropriate language in the initial MS4 permit, agency leadership should also expect a learning curve for growing understanding. By leading the dialogue and providing ample justification, TS4 alternatives may be considered for the permit and subsequent program implementation. In doing so, objectives can not only be more relevant to DOT activities,

but the probability of success is significantly raised by including deliverables that can actually be completed.

Conclusion & Recommendations

The general concept of MS4 compliance generally follows two main concepts: the permit and the program. As Iowa DOT proceeds with MS4 compliance, it is critical to both acknowledge these as two separate concepts. While not wholly mutually exclusive, the two terms often require clarification and reinforcement of two separate intentions when proceeding with both a permit as a document and note of record for legal compliance and a program as a comprehensive strategy for implementation.

The permit. By definition, a permit is a set of guidelines and strategies established and mutually agreed upon between a permit applicant and an approving agency. Approval grants "permission" of activities as described within the legally approved language. The permit serves as the foundation for all other compliance activity. Approval of an MS4 permit initiates the approval process, however attaining the permit does not guarantee full compliance. No permit holder should ever agree on paper to terms that are impossible to achieve. Municipalities can write ordinances and leverage local law enforcement for compliance. Agencies, universities and military bases lack these capabilities. Therefore, during the permit approval process, it is critical to provide ample background information and justification for any alternatives suggested for any existing requirements. The more educated the regulator can be on both why the alternative is suggested, and how equal benefit can still be achieved, the more likely the permit language will be negotiable.

As an example of an existing MS4 permit for an Iowa municipality, the Dubuque, Iowa permit language is included as Appendix 1 of this report, approved December, 2013 by Iowa DNR. This permit was chosen as an example based on both comprehensive program content and emphasis on water quality and watershed management activities as best practices.

The program. The type of action, frequency of action, and quality of action are what determine success for an MS4 program. The program is the daily, ongoing activities that occur based on the language within the approved permit. It is the program, not the permit, which determines the success or failure of an MS4 program. The permit reporting cycle is meant to both track activities and also evaluate effectiveness. The initial program development phase will include numerous inventories, data collection or repurposing, growing consensus on common language and knowledge, and establishing parameters for the overall program scope. In time, effort should shift to

maintaining that which was developed, and applying adaptive management when necessary to adjust, grow and evolve programs. The agency benefits from consistent information over time, and citizens benefit from continuity in service and trust.

The first year of Implementation begins with a heavy amount of data collection, organization and prioritization. The more efficient this data can be managed at the beginning of the process, the greater the potential for long-term success. This includes inventorying existing staffing, programs, projects and resources that may have relevance to MS4 compliance, as well as building consensus on appropriate content and language for an agency MS4 permit.

Stakeholder engagement is also critical component of MS4 compliance across all required measures. The more both internal and external stakeholders are aware of the situation, the greater the likelihood for partnership and building trust among the community. By maintaining the multi-state MS4 network that evolved out of this and other recent information exchanges, Iowa DOT benefits greatly from diverse resources with both depth and breadth of knowledge.

Implementation. The 18-month timeline and budget spans the initial agreement by Iowa DOT to proceed with MS4 permit development. The intent is to reflect both language development for the permit itself, as well as formally establishing an MS4 program within the agency. Given recent enforcement action in other Region VII states, it is likely Iowa DOT will experience some form of corrective action in the future. The question becomes *when will* Iowa DOT implement an MS4 program rather than *if*. Doing nothing is not an option for the long term.

Should Iowa DOT choose to proactively pursue an MS4 permit and program, there would be an increased likelihood in opportunity for negotiating language related to non-municipal entities, and maintaining a leadership role in the process. Waiting for a requirement will significantly reduce opportunities for flexibility and negotiation. Similar to Nebraska and Kansas, Iowa DOT should consider some form of data and document management system to track all relevant MS4 program information. Initial data management may concentrate on construction compliance. However, in time all other MS4 activities may be included in a comprehensive system. Other data to be organized includes MS4 community contacts: Assemble and maintain a list of city stormwater, public works and watershed management contacts. These local resources may help reduce redundant activity within local jurisdictions, and will also benefit from receiving regular communications from Iowa DOT regarding MS4 compliance.

While some existing activities within the agency may be recognized as also fostering compliance with MS4 permit requirements, there is likely a need to establish additional program elements. Examples may include:

- ***Formally structured outreach and engagement strategies for internal and external stakeholders:*** Activities also include in-house training for agency-wide MS4 compliance.
- ***Defining an illicit discharge detection and elimination strategy:*** Including design, construction and maintenance in the process to both acknowledge current conditions and also plan for future projects to take future IDDE impacts into account.
- ***Considering compliance with active and post construction as related to linear projects:*** Coordinating a streamlined communication chain and knowledge base where contacts at any point in the project (planning, construction or maintenance) are aware of both activities and obligations required for compliance.
- **Stakeholder Engagement.** Iowa DOT maintains obligations to both primary and secondary public audiences. By engaging with both internal and external stakeholders, the agency grows trust, credibility, and also opportunities to leverage resources for mutual benefit. By considering the matrix demonstrated in Table 21, information can be shared across audiences in various ways, yet the common theme remains constant. With internal communications, information to primary audiences may be more technical in detail. For external audiences, regulators, local partners and citizen groups may each require separate methods of sharing information.

	Primary	**Secondary**
Internal	Construction, Engineering, Design, OLE, Bridge/Hydro, etc.	Administrative management All staff
External	Regulators Contractors Adjacent land owners	Non-regulatory agency partners Community members
Content Level	Higher technical detail	Summative, scheduled reporting

TABLE 21: CONTENT CONSIDERATIONS FOR PRIMARY AND SECONDARY INTERNAL AND EXTERNAL AUDIENCES.

Budgeting. Opportunities exist for both leveraging existing program funds within Iowa DOT, as well as seeking potential new resources to implement a successful MS4 program. Partnerships with municipalities may lead to projects where city stormwater utility dollars can be leveraged as match for outreach, engagement, post construction or good housekeeping activities. Similarly, local watershed groups may exist as potential funding partners for post construction projects on land adjacent to DOT right-of-way. State and federal grants are currently funding dozens of watershed projects. Matching support from Iowa DOT would both grow the scale of water quality benefits, as well as strengthen local partnerships. A new program established by the Iowa Economic Development Authority (IEDA) works with a "sponsored projects" program for state revolving fund (SRF) loans. A percentage of the interest paid on the loan is allocated specifically to local water quality improvement projects.

Communities often borrow from this fund for major capital projects such as sewer upgrades and other local infrastructure. Matching support from local communities may include those participating in the sponsored projects SRF program for post construction practices such as low-impact development (LID). Should the road use tax fund increase, Iowa DOT should consider allocating 2-6 percent of new funds to MS4-related activities not currently supported by agency funds. This will likely be primarily comprised of construction, IDDE and long-term maintenance-related activities.

Outreach, involvement, post-construction and good housekeeping may look to existing programs for initial support by repurposing existing activities. For example, as new rest areas are constructed, Iowa DOT may require the site to manage a percentage of runoff volume for water quality protection. In doing so, practices may be showcased as educational opportunities within the facility – thereby satisfying both post-construction and outreach objectives of an MS4 program. These activities may already be occurring. If so, there needs to be documentation and sharing of information with the regulator to that effect.

Peer Network. A strong alliance of state transportation agency contacts came together as a result of this project, as well as due to support from FHWA for additional information exchanges beyond this project scope. By continually sharing information across geographical and political boundaries, each program benefits. By monitoring activities within fellow Region VII states, Iowa DOT can work to develop practical, attainable program goals. In return, other states share in the ongoing learning process as policies and rules evolve in the regulatory sphere. Reciprocity for contractor certification may increase efficiencies. Long-standing programs have the benefit of time to learn and evolve. Agencies with recent regulatory enforcement action have yet another unique experience to share. And newly-launched programs have the benefit of learning from

both. Rather than repeat similar mistakes, Iowa DOT should heed the advice of other state MS4 program contacts. Should a more "TS4" minded permit be approved, Iowa can then also demonstrate leadership to other transportation MS4 programs.

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Appendix 1: Dubuque, Iowa MS4 Permit Language

Facility Name: City of Dubuque Municipal Separate Storm Sewer System

Permit Number: 31-26-0·04 Final Permit

PART 1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

A. Permit Area

This permit covers all areas within the boundaries of the City of Dubuque totaling approximately 31 square miles which is drained by the city's Municipal Separate Storm Sewer System (MS4) and any other areas added while this permit is in effect.

B. Authorized Discharges

This permit authorizes all existing or new storm water point source discharges to waters of the State from the MS4. This permit also authorizes the discharge of storm water commingled with flows contributed by process wastewater, non-process wastewater, or storm water associated with industrial activity provided such discharges are authorized under separate NPDES permits, as required by law. This permit does not authorize discharges to the MS4.

C. Limitations on Coverage

The following discharges are not authorized or regulated by this permit:

Storm water discharges that are mixed with non-storm water and storm water associated with industrial activity except where such discharges are:

1. in compliance with a separate NPDES permit; or

2. identified by and in compliance with Part IV. of this permit.

PART II. STORM WATER POLLUTION PREVENTION & MANAGEMENT

The permittee shall implement the Best Management Practices (BMPs)~ measurable goals and frequencies described in the following sections.

A. Public Education and Outreach on Storm Water Impacts

The permittee shall continue implementing a public education and outreach program about the impacts of storm water discharges and measures which the residents of the permittee can implement to reduce pollutants in storm water runoff that includes the following:

1. General Storm Water Education Brochure - An informational brochure shall continue to be distributed to all new businesses and residents served by the MS4. The brochure shall present information regarding storm water impacts on water quality and measures that can be implemented to reduce water quality degradation from storm water.

The brochures shall be distributed by the permittee for the duration of the permit. The brochures shall also be made available on the permittee's website and at all city offices.

2. Telephone Hotline Number - The permittee shall provide a telephone number for the reporting of storm water related problems. The telephone number shall be made available on the website and included in other stormwater educational materials.

The telephone number shall be made available for the duration of the permit.

3. Storm Water Web Page - The permittee's website shall contain information regarding storm water impacts on water quality, measures residents can implement to reduce pollutants in storm water, regulations, current local topics) information in the brochures and links to other relevant websites. A form for reporting storm water complaints shall be provided on the website. The website shall be updated as needed.

The storm water web page shall be maintained by the permittee for the duration of the permit

4. Storm Drain Labeling - The program shall continue to be implemented by the permittee to ensure all municipal storm sewer intakes are labeled for the duration of the permit.

5. Educational Television Program - The permittee shall continue to offer a video program which presents information regarding storm water impacts on water quality and measures residents can implement to reduce water quality degradation from storm water. The program shall be televised at least once each calendar quarter and made available to residents on the permittee's website.

The program shall be televised and made available for the duration of the permit.

6. Public Education Program The permittee shall continue to make available to schools served by the MS4 and shall encourage the adoption of educational materials regarding storm water and its impact on water quality. Each school year the permittee shall contact the school board to determine the status of the program and to ensure the material is still available for use in the classrooms.

The educational materials shall be provided by the permittee for the duration of the permit.

B. Public Involvement and Participation

The permittee shall continue implementing a public involvement and participation program that includes the following:

1. Environmental Advisory Commission - The permittee shall continue to hold meetings with an environmental advisory commission. The commission shall develop, articulate and propose goals, objectives and policies regarding storm water issues. The commission shall also advise and inform the permittee regarding compliance with the MS4 permit, hold public meetings each calendar quarter where storm quality issues are discussed with residents. The commission shall be allowed to provide information for storm water education programs, educational materials and volunteer opp0l1unities and shall provide input regarding storm water quality issues in relationship to the permittee's storm water management activities. Businessmen, developers, homeowners, members of environmental groups and members of the public at large shall be allowed to participate, if interested. However, the permittee may place reasonable limits on the total number of individuals participating in the group.

Meetings held at least once each calendar quarter for the duration of the permit.

2. Water Quality Monitoring - The permittee shall continue to work with water quality monitoring groups to determine the water quality of receiving waters near storm sewer outfalls. The permittee shall promote monitoring activity by funding monitoring training and equipment. The data from the monitoring shallbe made available to members of the public and to the Deparment as requested.

The monitoring activities shall continue for the duration of the permit.

C. Illicit Discharge Detection and Elimination

The permittee shall continue implementing and enforcing a discharge detection and elimination program that includes the following:

1. Illicit Discharge Prohibition Ordinance - An ordinance shall continue to be amended as necessary and enforced by the permittee that prohibits anything other than stormwater, allowable non-storm water and pollutants for which an NPDES permit has been issued and when the discharge is in compliance with the permit from entering the MS4. The ordinance shall include language that enables the permittee to inspect private propel1y if an illicit discharge is suspected and penalties for non-compliance.

The ordinance shall be enforced by the permittee for the duration of the permit

2. Illicit Discharge Detection and Elimination Program A program shall continue to be implemented to identify and eliminate illicit discharge to the MS4. The program shall include annual dry weather flow inspections of all outfalls not already inspected since flows from newly developed or re-developed areas have been discharged from the outfalls, sampling and analyses of these dry weather flows, procedures to identify the sources of the dry weather flows and procedures for disconnecting illicit connections. Dry weather flow inspections may be made at manholes and other points prior to the flows joining larger portions of the MS4 to facilitate detection of illicit discharges. Records shall be kept of when inspections are performed, the results of the inspections and measures taken to identify and, when appropriate, eliminate the sources of any dry weather flows. The plan shall be evaluated annually to assess the effectiveness of the program and any necessary changes made. All illicit discharges found must be eliminated no more than 21 days after discovery. If it is not possible to eliminate an illicit discharge within 21 days of discovery, the permittee shall submit to the Department the reasons why the discharge cannot be eliminated within 21 days of discovery and a plan which contains a timeline of activities which will result in the elimination of the discharge. This statement and plan shall be submitted within 21 days of discovery of the illicit discharge. If the Department does not approve the plan, the permittee will then be required to eliminate the discharge, no later than a date specified by the Department All illicit discharges shall be reported to the Department no later than the end of the first business day after the day of the discovery.

The plan shall be implemented by the permittee for the duration of the permit.

3. Pet Waste Ordinance - An ordinance shall continue to be amended as necessary and enforced that addresses the cleanup of pet feces. The ordinance shall require owners of pets to remove their pets~ feces immediately after being deposited on public property. The ordinance shall also require the proper disposal of the feces. Exemptions for manure from agricultural livestock when used for horticultural purposes may be included in the ordinance.

The ordinance shall be enforced by the permittee for the duration of the permit.

D. Construction Site Storm Water Runoff Control

The permittee shall continue implementing and enforcing a construction site storm water runoff control program to reduce pollutants in any storm water runoff from construction activities for which storm water permit coverage is required and that includes the following:

1. Construction Site Runoff Control Ordinance - An ordinance shall continue to be amended as needed and enforced on all sites for which NPDES permits are required that requires proper soil erosion and sediment control. This ordinance shall also address waste at construction sites that may cause adverse impacts to water quality such as building materials, concrete truck washout, chemicals, solid waste and sanitary waste. Authority to issue an order to terminate activities due to failure to implement or maintain pollution control BMPs, authority for the permittee to enter private property for the purposes of compliance inspections and penalties for non-compliance shall be included. The ordinance shall require site plan and pollution prevention plan review and approval by the permittee prior to issuance of any permits for the site by the permittee. The ordinance shall require compliance with the Department's Storm Water General Permit no. 2.

The ordinance shall be enforced by the permittee for the duration of the permit.

2. Construction Site Review and Inspection Program - The permittee shall require site plan and pollution prevention plan review and approval by the permittee or the permittee's agent prior to issuance of any permits for the site by the permittee for construction activities for which an NPDES permit is required. The program shall require compliance with the Department's Storm Water General Permit no. 2 and inspections by the permittee of all sites for which coverage under General Permit no. 2 is required. The program shall require each of these sites be inspected by the permittee at least once each calendar year.

If an entity other than the permittee reviews the site plans and pollution prevention plans, the permittee shall provide sufficient oversight to ensure the reviews are done properly and that the entity performing the reviews has no conflicts of interests in this matter.

The program shall be implemented by the permittee for the duration of the permit.

3. Contractor Workshop - The permittee shall continue to conduct or sponsor workshops intended to educate developers, builders, contractors and consultants about ways in which developments and construction sites can be designed and maintained to implement erosion and sediment control and to improve the quality of storm water runoff.

The permittee shall hold workshops at least once each year for the duration of the permit.

E. Post-construction Storm Water Management

The permittee shall continue implementing and enforcing a program to address storm water runoff from new construction and re-construction projects for which storm water coverage is required. The program must ensure that controls are in place that will prevent or minimize water quality impacts and shall include the following:

1. Post-construction Site Runoff Control Policy Ordinance. An ordinance shall continue to be amended as necessary and enforced will address the control of runoff from building activities after construction has been completed. The ordinance shall require water quality and quantity components be considered in the design of new construction and implemented when practical.

The ordinance shall promote the use of storm water detention and retention, grass swales, bioretention swales, riparian buffers and proper operation and maintenance of these facilities.

The ordinance shall be enforced by the permittee for the duration of the permit.

2. Site Plan Review of Post-construction Runoff Controls The permittee shall continue to implement procedures and acceptance criteria for review of post-construction runoff controls for all construction sites for which coverage under NPDES storm water permits are required. The permittee shall not allow construction activities to commence until the plans for post-construction runoff controls have been reviewed and approved.

The program shall be implemented by the permittee for the duration of the permit.

3. Inspection of Runoff Control Devices - Storm water control devices and structures shall continue to be inspected and reviewed for proper maintenance. Educational materials shall continue to be made available to landowners which outline proper maintenance procedures. The permittee shall properly maintain its own control devices and structures.

Inspections shall be conducted by the permittee for the duration of the permit. The educational materials shall be made available by the permittee for the duration of the permit.

4. Watershed Assessment Program - A watershed assessment program and comprehensive land use plan shall continue to be implemented which outlines measures to be implemented which reduce flooding, reduce erosion in ditches and streams) improve water quality and reduce degradation of habitat for fish and wildlife. The permittee shall then implement the program whenever possible to meet these goals.

The program shall be implemented by the permittee for the duration of the permit.

S. Low Impact Development Workshop The permittee shall continue to conduct and or sponsor workshops intended to educate developers and house builders about ways low impact development and new design techniques that include structural best management practices can improve the quality of storm water runoff.

The permittee shall hold workshops at least once each year for the duration of the permit.

F. Pollution Prevention/Good Housekeeping

The permittee shall continue implementing an operation and maintenance program, including a training component, that shall prevent or reduce pollutant runoff from municipal operations and that shall include the following:

1. Operation and Maintenance of MS4 - A program for inspecting, maintaining and cleaning all components of the MS4 including street sweeping shall continue to be implemented. Storm sewers shall be inspected at least once every ten years, catch basins shall be inspected at least once every five years, detention basins shall be inspected at least once each year and maintenance performed as appropriate.

The program shall be implemented by the permittee for the duration of the permit.

2. Pesticide and Fertilizer Management Program - A pesticide and fertilizer management program shan continue to be implemented and enforced which shall reduce pollutant discharge associated with storage, application and disposal of pesticides and fertilizers for municipal operations. The program shall identify all municipal entities that apply pesticides and fertilizers, require that application of these chemicals be applied by properly trained individuals, require training on management techniques addressing storage, application and disposal. Data regarding the application rates of pesticides and fertilizers shall be gathered and evaluated to determine if lower rates would be equally effective. Should it be determined that lower application rates would be equally or nearly as effective it shall be required that the lower rates be applied.

The program shall be implemented by the permittee for the duration of the permit.

3. Training Program for Municipal Employees The permittee shall continue to implement a program for training municipal employees regarding practices to be implemented in city operations to reduce pollutants in storm water.

The program shall be implemented by the permittee for the duration of the permit.

4. City Facilities BMPs - A program shall continue to be implemented to assess BMPs at city facilities to be implemented that reduce pollutants in storm water from these facilities. These measures shall then be implemented whenever practical.

The program shall be implemented by the permittee for the duration of the permit.

PART III. REPORTING REQUIREMENTS

Annual Report

The permittee shall prepare an annual report to be submitted to the Department no later than September 30 of each calendar year. The report shall be submitted to the appropriate Department field office and shall include the following:

1. The status of implementing the components of this permit Any modifications developed by the permittee and approved by the Department or required by the Department shall also be addressed.

2. A summary of the data, including monitoring data if it exists, that is generated within the reporting period including a narrative description of storm water quality improvements or degradation.

3. An estimate of the previous fiscal year's expenditures for implementation of the requirements of this permit and the budget for the current fiscal year.

4. A summary describing the number and nature of inspections} enforcement actions, illicit discharges discovered, ordinances adopted> public education programs conducted, components of the MS4 cleaned, stream restoration activities, meetings held and any other actions taken by the permittee required by this permit during the reporting period.

PART IV. SPECIAL CONDITIONS

Only storm water, allowable non-storm water, and pollutants for which an NPDES permit has been issued and when the discharge is in compliance with the permit, are allowed to be discharged to the MS4. The permittee shall not have nor allow any discharge of pollutants from a site, facility or source for which an NPDES permit is required unless an NPDES permit has been issued for the discharge. Upon discovery of any unpermitted discharge for which a permit is required or, if an NPDES permit has been issued for the discharge, a discharge not in compliance with the permit, the permittee shall report the discharge to the Department no later than the end of the next business day after the discharge is discovered. Floor drains and other potential sources of pollutants shall be considered discharges even if no actual pollutants have been observed entering the MS4 from such a source.

The permittee is prohibited from issuing any permit, authorization or license allowing any construction, excavating, clearing, grubbing, or any other soil disturbing activity and is prohibited from allowing a person, persons, company, political unit or other entity, public or private, from doing same for which, in whole or as part of another project, coverage under an NPDES permit is required without first ensuring that a storm water authorization from the Department has been issued for the activity.

A construction site inspection program shall continue to be implemented for construction projects owned or operated by the permittee that include areas of soil disturbance for which NPDES permits are required. The inspection program shall be used to ensure tl1at contractors are correctly implementing BMPs which have been approved in the pollution prevention plan and any additional necessary measures. The program shall require inspections by the permittee at least every 7 days and within 2 business days of a 0.50 inch or greater rain event and include any other provisions necessary to ensure compliance by contractors with the storm water General Permit no. 2. Inspections required by General Permit no. 2 must also be conducted by the contractors or the permittee including inspections within 24 hours of the end of a 0.50 inch or greater rain event. Inspections made by the permittee that satisfy the requirements of General Permit no. 2 may be used to satisfy the requirements of this permit.

A map of the MS4, including all outfalls, shall be maintained for the duration of this permit.

All salt storage shall be in a structure impervious to precipitation and any spillage due to handling activities in an area subject to runoff shall be immediately removed.

The manner in which actions required by this permit are accomplished by the permittee is subject to review and approval by the Department. Should the Department give notice to the permittee that the approach used by the permittee to comply with any permit provision is unacceptable, the permittee must modify its approach as required in order to be considered in compliance with the permit.

PART V. STANDARD CONDITIONS

A. Permittee's Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. Issuance of this permit does not relieve the permittee of the responsibility to comply with all local, state and federal laws, ordinances, regulations or other legal requirements applying to the operation of this facility (see 40 CFR 122.41 (a) and 567-64.3(11) IAC).

B. Duty to Provide Information

The permittee shall furnish to the Depa11ment, within a time specified by the Depm1ment, any information that the Depal1ment may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee must also furnish to the Depal1ment, upon request, copies of any records required to be kept by this permit

C. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Signatory Requirements

Storm Water Pollution Prevention Plans, reports, ce11ifications or information either submitted to the Depal1ment or that this permit requires be maintained by the permittee, shall be signed as follows:

For a municipality, State, Federal, 01' other public facility: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes 1) the chief executive officer of the agency, or 2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

Certification: Any person signing documents shall make the following ce11ification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquity of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

E. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

F. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights} nor any infringement of Federal, State, or local laws or regulations.

G. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances) and the remainder of this permit shall not be affected thereby.

H. State/Environmental Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes, regulations or permits.

I. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by the permittee only when necessary to achieve compliance with the conditions of the permit.

J. Inspection and Entry

The permittee shall allow the Department, an authorized representative or an authorized representative of the municipal operator of the separate storm sewer receiving the discharge, upon the presentation of credentials and other documents as may be required by law to: enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit; have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; inspect at reasonable times any facilities or equipment (including monitoring and control equipment); and to sample any discharge of pollutants.

K. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or discontinuance, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. This permit may be modified due to conditions or information on which this permit is based, including any new standard the Department may adopt that would change the required effluent limits.

L. Potential or Realized Impacts on Water Quality

If there is evidence indicating potential or realized impacts on water quality or on a listed endangered species due to any storm water discharge associated with industrial activity covered by this permit, the permit shall be modified to include different limitations and/or requirements of the Pollution Prevention Plan and its implementation.

M. Failure to submit fees

This permit may be revoked, in whole or in part, if the appropriate permit fees are not submitted within sixty (60) days of the date of notification that such fees are due.

N. Penalties For Violations of Permit Conditions

Section 309 of the CWA provides significant penalties for a person(s) who violates a permit condition implementing Section 301, 302, 306, 307, 318, or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402. Any person(s) who violates any condition of this permit is subject to a civil penalty not to exceed $25,000 per day of such violation, as well as any other appropriate sanction provided by Section 309 of the CW A.

PART VI. DEFINITIONS

1. Allowable Non-Storm Water means: discharges from fire fighting activities, fire hydrant flushings, potable water sources, waterline flushings, uncontaminated groundwater, foundation or footing drains where flows are not contaminated with process materials such as solvents, springs, riparian habitats, wetlands, irrigation water, air conditioning condensate, exterior building washwater when no detergents or other surfactants are used and pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred and when no detergents or other surfactants are used.

2. Best Management Practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

3, Calendar Quarter means each of the following periods: December through February, March through May, June through August and September through November.

4. CWA means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972).

5. Department means the Iowa Department of Natural Resources (IDNR)or an authorized representative.

6, Discharge means the release of water and any elements, compounds and particles contained within or upon, from property owned or controlled by an individual, individuals, or entity.

7. Facility means any entity which discharges storm water.

8. Municipal separate storm sewer system means the conveyance or system of conveyances including storm sewers, roadways, roads with drainage systems, catch basins, curbs, gutters, ditches, constructed channels and storm drains owned or operated by the permittee.

9. Permittee means the City of Dubuque.

10. Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

11. Significant materials includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101 (14) of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); any chemical the facility is required to report pursuant to Emergency

Planning and Community Right-to-Know Act (EPCRA) Section 313; fertilizers; pesticides; and waste products such as ashes~ slag and sludge that have the potential to be released with storm water discharges.

12. Storm water means storm water runoff, snow melt runoff, and surface runoff and drainage.

13, Storm water discharge associated with industrial activity means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in paragraphs (i) through (x) of this definition, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material~ or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste "waters (as defined at 40 CFR Part 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in paragraph (xi) of this definition, the term includes only storm water discharges from all areas (except access roads and rail lines) listed in the previous sentence where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant1s industrial activities} such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally, State, or municipally owned or operated that meet the description of the facilities listed in paragraphs (i) to (xi) of this definition) include those facilities designated under 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity' for purposes of this subsection.

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards that are exempted under category (xi) of this definition);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267),28 (except 283 and 285), 29, 311, 32 (except 323), 33~ 3441, 373;

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(1) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations that have been released from applicable State or Federal reclamation requirements after December] 7, 1990) and oil and gas exploration) production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but that have an identifiable owner/operator;

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii)Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 422125), 43, 44, 45 and 5171 that have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airp0l1 deicing operations, or that are otherwise identified under paragraphs (i) to (vii) or Ox) to (xi) of this subsection are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR Part 403. Not included are farm lands, domestic gardens or lands used for sludge management, where sludge is beneficially reused and that are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR Part 503;

(x) Construction activity including clearing, grading and excavation activities that result in the disturbance of 1 acre or more of total land area or which result in the disturbance of less than 1 acre but are part of a larger common plan of development or sale of 1 acre or more;

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and that are not otherwise included within categories (i) to (x)).

14. Waters of the State means any river, stream, lake, pond, marsh, watercourse, waterway, well, spring, reservoir, aquifer, irrigation system, drainage system and any other body or accumulation of water, surface or underground, natural or artificial, public or private, which are contained within, flow through or border upon the state or any portion thereof.

Appendix 2: 18-Month Performance Goals & Budget

18-Month Performance Goals & Budget					
	Anticipated Budget:	$ 1,312,745			*indicates existing activities
Outreach & Education	**$ 235,850**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Develop appropriate external messaging and branding for DOT as an MS4.	0.65	$ 49,335	$ 85,000	Print, online, media exposure. Number of responses/replies. Scripted call to action.
	Identify "Priority MS4 Areas"	0.35	$ 26,565	$ 12,000	Stakeholder involvement in selected areas. Service on DOT committee.
	Establish formal training alliance with AGC.	0.5	$ 37,950	$ 25,000	Number of trainings conducted. Number of participants.
		SUBTOTALS:	*$ 113,850*	*$ 122,000*	
Public Involvement	**$ 112,105**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Establish internal MS4 committee.*	0.15	$ 11,385	$ 10,000	Regularly scheduled meetings and minutes.
	Establish external stakeholder committee.	0.25	$ 18,975	$ 10,000	Regularly scheduled meetings and minutes.
	Adopt-A-Highway leveraged as relevant activity.*	0.15	$ 11,385	$ 10,000	Miles of annual cleanup activity. Tonnage of waste removal.
	Coordinate project meetings to include MS4 material & discussion.*	0.4	$ 30,360	$ 10,000	Regularly scheduled meetings and minutes.
		SUBTOTALS:	*$ 72,105*	*$ 40,000*	
IDDE	**$ 168,940**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Coordinate drain/inlet mapping with MS4 communities.	1	$ 75,900	$ 25,000	Map and database as records for reporting.
	Dry weather assessment of 20% of outfalls in priority MS4 areas.	0.15	$ 11,385	$ 5,500	Map and database as records for reporting.
	Online & Phone reporting system developed for illegal spills/dumping/litter.*	0.25	$ 18,975	$ 10,000	Response record for reporting. Response tracking for mitigation.
	Spill Management Response Plan*	0.25	$ 18,975	$ 22,180	Response record for reporting. Response tracking for mitigation.
		SUBTOTALS:	*$ 106,260*	*$ 62,680*	
Construction	**$ 302,250**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Expand ESC training to incorporate MS4 goals & objectives.*	0.5	$ 37,950	$ 15,000	Number of trainings conducted. Number of participants.
	Coordinate ESC guidance with MS4 communities.	1	$ 75,900	$ 12,500	Regularly scheduled meetings and minutes.
	Develop an inspection/compliance/response database for efficient record keeping and reporting.	1	$ 75,900	$ 85,000	Response record for reporting. Response tracking for mitigation. Compliance check-and-balance system.
		SUBTOTALS:	*$ 189,750*	*$ 112,500*	
Post Construction	**$ 200,235**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Incorporate IRVM in all practicable instances after final grading.*	0.65	$ 49,335	$ 40,000	Reduction in mowing costs. Reduction in pesticide application. Habitat establishment.
	Conduct annual training for District Maintenance Staff on MS4 Programming.*	0.5	$ 37,950	$ 15,000	Number of trainings conducted. Number of participants. Changes in maintenance activities.
	Set runoff reduction goals for DOT facilities.	0.5	$ 37,950	$ 20,000	Number of gallons treated (runoff). Tons/acre/year sediment retained. Nutrient load reduction. Habitat enhancement/protection.
		SUBTOTALS:	*$ 125,235*	*$ 75,000*	
Good Housekeeping	**$ 293,365**	**FTE Needs**	**FTE Expenses**	**Project Expenses**	**Measure of Success**
	Develop MS4 Program, Permit & Plan	0.5	$ 37,950	$ 45,000	Document of record.
	Develop Facilities Runoff Control Plan (FRCP) based on Nebraska Model.	0.5	$ 37,950	$ 45,000	Document of record.
	Incorporate winter road maintenance activities with MS4 program strategies.	0.35	$ 26,565	$ 12,500	Number of trainings conducted. Number of participants. Changes in maintenance activities.
	Incorporate existing environmental compliance programs with MS4 strategies (pesticide, wetlands, etc.)	1	$ 75,900	$ 12,500	Number of trainings conducted. Number of participants. Changes in activities.
		SUBTOTALS:	*$ 178,365*	*$ 115,000*	
		Total Budget:	**$**	**1,312,745**	

Appendix 3: 18-Month Performance Timeline

18-Month Performance Timeline

** indicates existing activities*			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Outreach & Education	**Goal**	**Measure of Success**																		
	Develop appropriate external messaging and branding for DOT as an MS4.	Definitions established (outfall, MEP, etc.) Print, online, media exposure. Number of responses/replies. Scripted call to action.																		
	Identify "Priority MS4 Areas"	Stakeholder involvement in selected areas. Service on DOT committee.																		
	Establish formal training alliance with AGC.	Number of trainings conducted. Number of participants.																		
Public Involvement	**Goal**	**Measure of Success**																		
	Establish internal MS4 committee.*	Regularly scheduled meetings and minutes.																		
	Establish external stakeholder committee.	Regularly scheduled meetings and minutes.																		
	Adopt-A-Highway leveraged as relevant activity.*	Miles of annual cleanup activity. Tonnage of waste removal.																		
	Coordinate project meetings to include MS4 material & discussion.*	Regularly scheduled meetings and minutes.																		
IDDE	**Goal**	**Measure of Success**																		
	Coordinate drain/inlet mapping with MS4 communities.*	Map and database as records for reporting.																		
	Dry weather assessment of 20% of outfalls in priority MS4 areas.*	Map and database as records for reporting.																		
	Online & Phone reporting system developed for illegal spills/dumping/litter.	Response record for reporting. Response tracking for mitigation.																		
	Spill Management/Response Plan.	Internal accountability.																		
Construction	**Goal**	**Measure of Success**																		
	Expand ESC training to incorporate MS4 goals & objectives.*	Number of trainings conducted. Number of participants.																		
	Coordinate ESC guidance with MS4 communities.	Regularly scheduled meetings and minutes.																		
	Develop an inspection, compliance & response database for efficient record keeping and reporting.	Response record for reporting. Response tracking for mitigation. Compliance check-and-balance system.																		
Post Construction	**Goal**	**Measure of Success**																		
	Incorporate IRVM in all practicable instances after final grading.*	Reduction in mowing costs. Reduction in pesticide application. Habitat establishment.																		
	Conduct annual training for District Maintenance Staff on MS4 Programming.*	Number of trainings conducted. Number of participants. Changes in maintenance activities.																		
	Set runoff reduction goals for DOT facilities.	Number of gallons treated (runoff). Tons/acre/year sediment retained. Nutrient load reduction. Habitat enhancement/protection.																		
Good Housekeeping	**Goal**	**Measure of Success**																		
	Develop MS4 Program, Permit & Plan	Document of record.																		
	Develop Facilities Runoff Control Plan (FRCP) based on Nebraska Model.	Document of record.																		
	Incorporate winter road maintenance activities with MS4 program strategies.*	Number of trainings conducted. Number of participants. Changes in maintenance activities.																		
	Incorporate existing environmental compliance programs with MS4 strategies (pesticide, wetlands, etc.)*	Number of trainings conducted. Number of participants. Changes in activities.																		

Appendix 4: Results for MCM Activities Literature Review & Survey

	Public Education & Outreach	Public Involvement	Illicit Discharge Detection and Elimination	Construction Site Control	Post-Construction	Pollution Prevention/Good Housekeeping
Virginia	- Website and fact sheet - Brochures at rest stops/welcome centers - Drain stenciling - Watershed signs 42 meetings and events held during 5 year period 5 training sessions on illicit discharge held during 5 year period MS4 compliance class developed for state employees	- Promote website - Reports available to public - Outreach activities 18,326 miles of highway adopted	- Inventory stormwater system - Track discharges - Update/review training practices for illicit discharge detection and elimination - Make training available to public - Public reporting of illicit discharge through website - Create land use permitting program - Develop listing of regulated MS4s and contact information - Develop policies and procedures to reduce pollutants Created complete inventory of all stormwater facilities	- Ensure DOT and other agency requirements followed for land disturbing activities through permit system - Erosion and sediment control training for contractors - Instream maintenance training for DOT personnel - Develop enforcement policies and procedures - Establish way for public to address concerns Site inspection and data reviews on 1,353 projects (99.4% compliance) Began tracking and registering land disturbing activities in DOT database	- Annual site evaluations - Promote low impact development - Compile database for DOT owned and operated stormwater management facilities	- Create Program to reduce runoff - Implement procedures, schedules and long term inspections to reduce discharge - Program to promote proper waste disposal - Employee pollution prevention education

	Public Education & Outreach	Public Involvement	Illicit Discharge Detection and Elimination	Construction Site Control	Post-Construction	Pollution Prevention/Good Housekeeping
Minnesota	- Distribute education materials about hazards of polluted stormwater - Partner with other MS4s to effectively distribute materials	- Annual public meetings - Website with feedback link	- Map storm sewer system that shows DOT pipelines, manholes, basins, aprons, ditches, outfalls, ponds, etc. - Develop plan to detect and address non-stormwater discharges - Prohibiting and enforcement of non-stormwater discharges - Educate on the hazards of improper disposals	- Follow NPDES - Proper erosion and sediment controls - Site reviews/inspections - Enforcement policies to ensure compliance	- Permit language which addresses volume, rate and quality of stormwater discharging onto MNDOT Metro	- Training for erosion and sediment control - Analyze deicing methods and use low impact when possible - Vegetation management program - Inspection, clean, and repair BMPs
Rhode Island	- Focus on education of state officials who deal with stormwater management - Create public education message	- Make annual report available for general public - If more than 25 request for public hearing are received during comment period, public hearing will be held	- Use summer interns and hired employees to identify, map, and describe all outfalls - Partner with RI Dept. of Environmental Management to enforce violations	- Develop two templates with regulations depending on project size - Large site SWPPP - Small site SWPPP	- Improve maintenance of BMPs such as regular cleaning	- Stormwater management program for all employees - Retrofit existing sites with structural BMPs or new systems

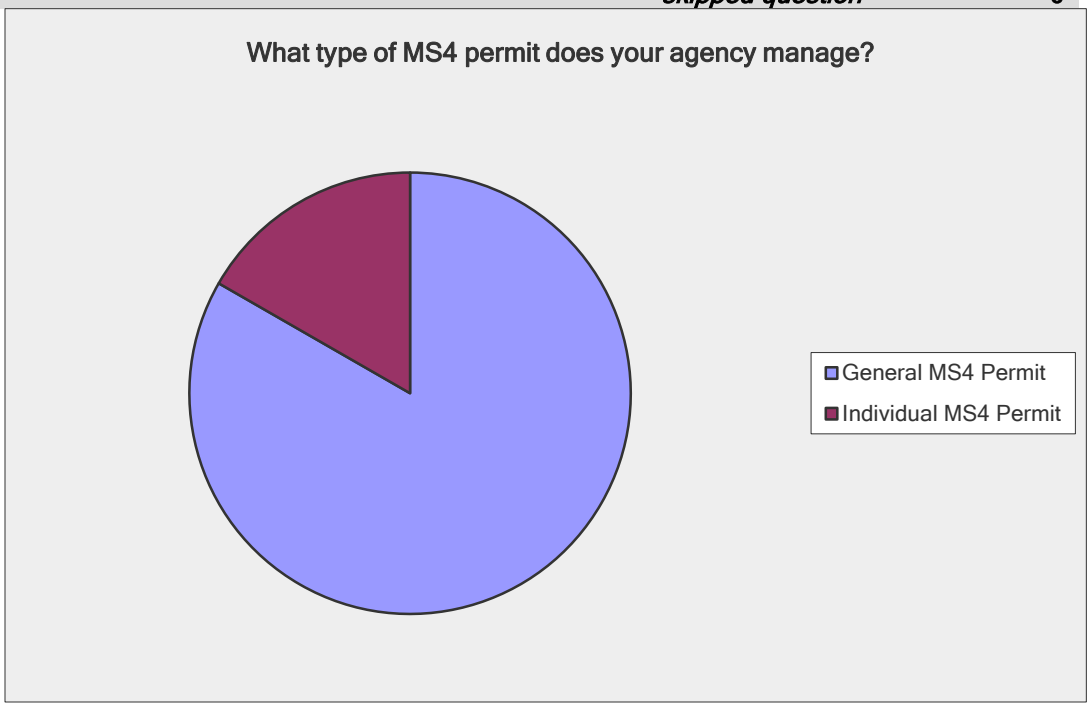
	- **Public Education & Outreach**	- **Public Involvement**	- **Illicit Discharge Detection and Elimination**	- **Construction Site Control**	- **Post-Construction**	- **Pollution Prevention/Good Housekeeping**
North Dakota	- Public/Contractor education program distribution of information on impact of stormwater discharges - Partner with other MS4s	- Comply with city, state, and federal requirements	- Adopt ordinances and regulations created by local MS4s prohibiting non-stormwater discharges - Educating public employees and other industries on hazards of improper disposal as ways to detect illicit discharges - Partner with other groups	- Develop enforceable program that addresses erosion and sediment control as result of stormwater runoff from construction sites - Site inspections through expanding authority of NDDOT - Determine BMPs	- Develop BMPs for post construction runoff - Long term operation and maintenance	- Develop a program to reduce pollutant runoff
New York	- Classroom education for staff - Joint conference between NYDOT and NY state chapter of the Association General Contractors of America - Webinars and other classes for DOT employees as needed - Public presentations - Adopt-A-Highway - CleanSweepNY provides more drop off locations for chemical and waste disposal	- Public involvement during project development plan - Public access to NYSDOT documents - Partner with other groups to address different concerns 9,600 cleanup events held	- Identify and report illicit discharges – handbooks and training for NYSDOT employees - Drainage mapping of all outfalls and water bodies that receive discharge from those outfalls - Outfall inspection 100% of outfalls maped 999 screened for dry weather discharge 8 detected and confirmed cases of illicit discharges 5% of storm sewershed mapping completed	- Erosion and sediment control required on all NYSDOT projects - Approved materials and equipment list - Site inspections and enforcement - Education training of construction site operators Inspection of all active sites more than once	- Multiple manuals on BMP Inspection and inventory of 6 different BMPs related to stormwater management	- Roadway, bridge, and drainage system maintenance - Roadside management - Vegetation management - Vehicle/fleet maintenance - Road-Kill Deer carcass composting operation and maintenance manual - Winter road maintenance

	- Spring Clean-Up events - Stormwater management website 5,000 miles adopted 5,013 bags weighing 63 tons collected in Sept. of 2005 786 construction operators trained 40 public events/presentations					
	Public Education & Outreach	**Public Involvement**	**Illicit Discharge Detection and Elimination**	**Construction Site Control**		
Michigan	- Maintaining information centers - Publishing articles in MDOT publications - Incorporate watershed stewardship on MDOT websites - Provide education materials in permit applications - Partner with department	- Present training modules to public - Have public review and comment on stormwater management plan Adopt-A-Highway, Youth Corps, Department of Corrections	- Submit and implement mapping for outfalls (urban) - Inventory dry weather screening outfalls - Notify department of environmental quality of illicit discharges and actions taken - Report updates to proper legal authorities - Map known outfalls (entire	- Maintenance requirements for MDOT permanent BMPs - Coordinate with other organizations that have storm water programs - Select, apply, and maintain BMPs for stormwater management - Review projects with stormwater discharges to water bodies - Internal quality control - Periodically update drainage manual - Document and track road maintenance activities - Procedure for labeling outfalls		

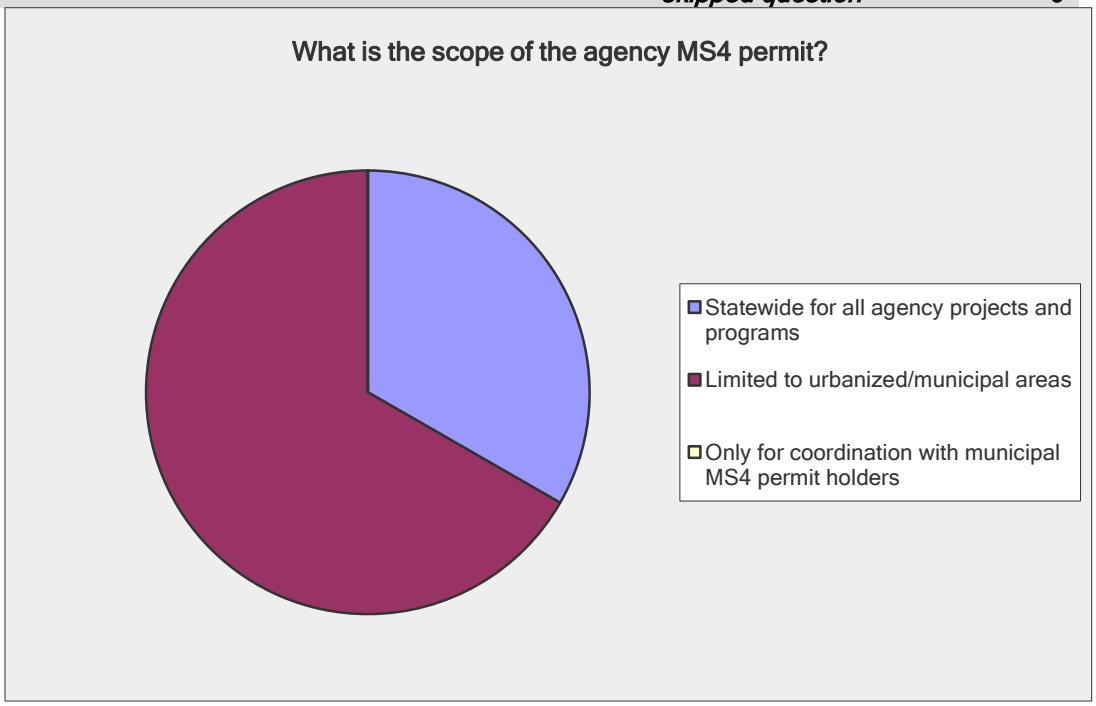
	of environmental quality for potential statewide education program - Survey staff on stormwater knowledge - Certify staff for pesticide and fertilizer application		state) 3 instances reported/discovered by staff Mapping of outfalls at stream crossings with urban areas Statewide map with known locations of MDOT outfalls (posted to website) Labeled newly constructed outfalls Interactive Training on website	- Review flow control structures - Audit pollution incident prevention plan requirements Cleaning of counterweight pits on bridges Drying bed at Newberry wastewater treatment plant rehabilitated with MDOT financial assistance. In return MDOT allowed to use facility for drying catch basin sediment Statewide truck inspections conducted by state police Pesticide applicator program Tracking use of road salt and sand applications Roadside maintenance by MDOT such as street sweeping, catch basing maintenance, ditch cleaning, underdrain maintenance, mowing, brush control, bank stabilization

Assessment of Existing Transportation MS4 Programs – Survey Questions

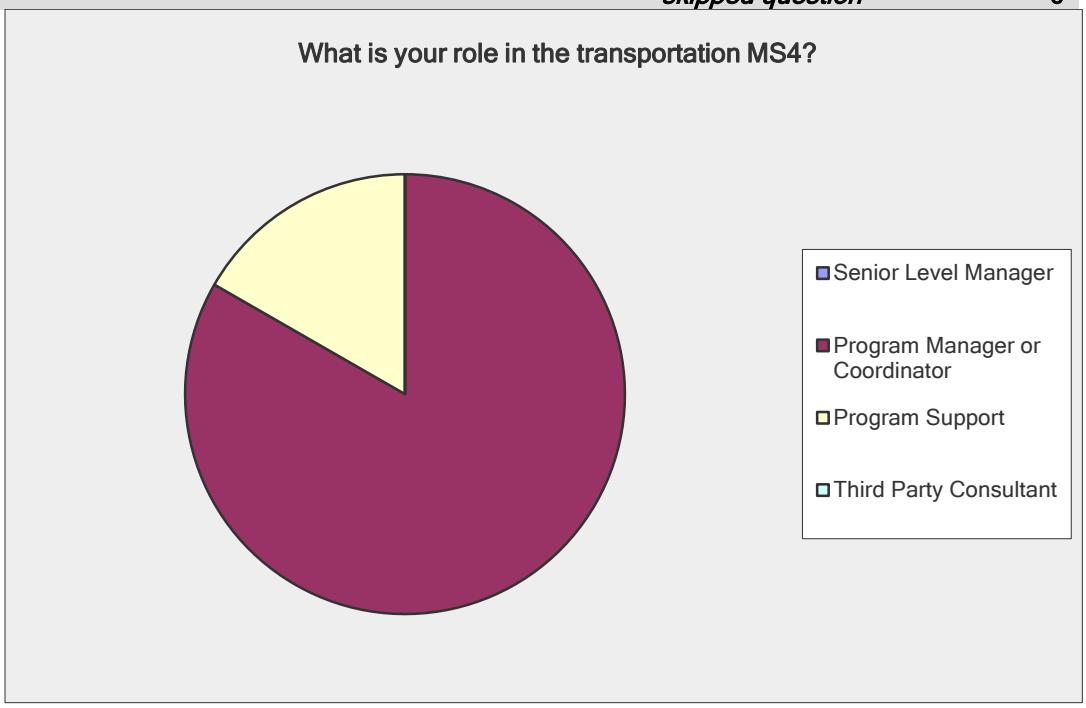
What type of MS4 permit does your agency manage?		
Answer Options	**Response Percent**	**Response Count**
General MS4 Permit	83.3%	5
Individual MS4 Permit	16.7%	1
answered question		6
skipped question		0



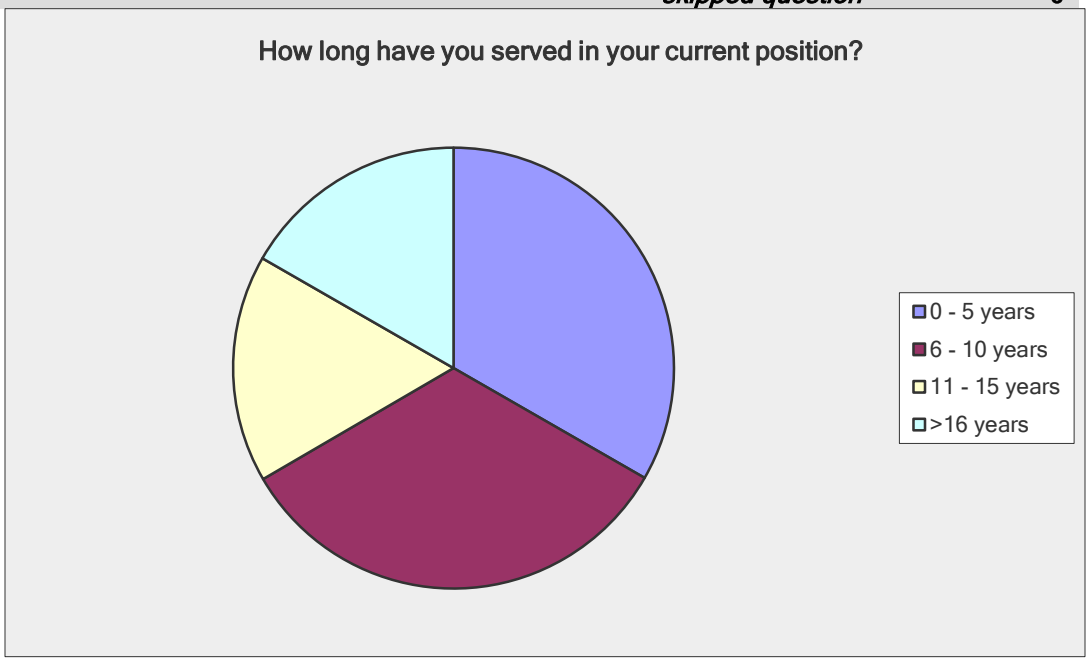
What is the scope of the agency MS4 permit?		
Answer Options	**Response Percent**	**Response Count**
Statewide for all agency projects and programs	33.3%	2
Limited to urbanized/municipal areas	66.7%	4
Only for coordination with municipal MS4 permit holders	0.0%	0
	answered question	6
	skipped question	0



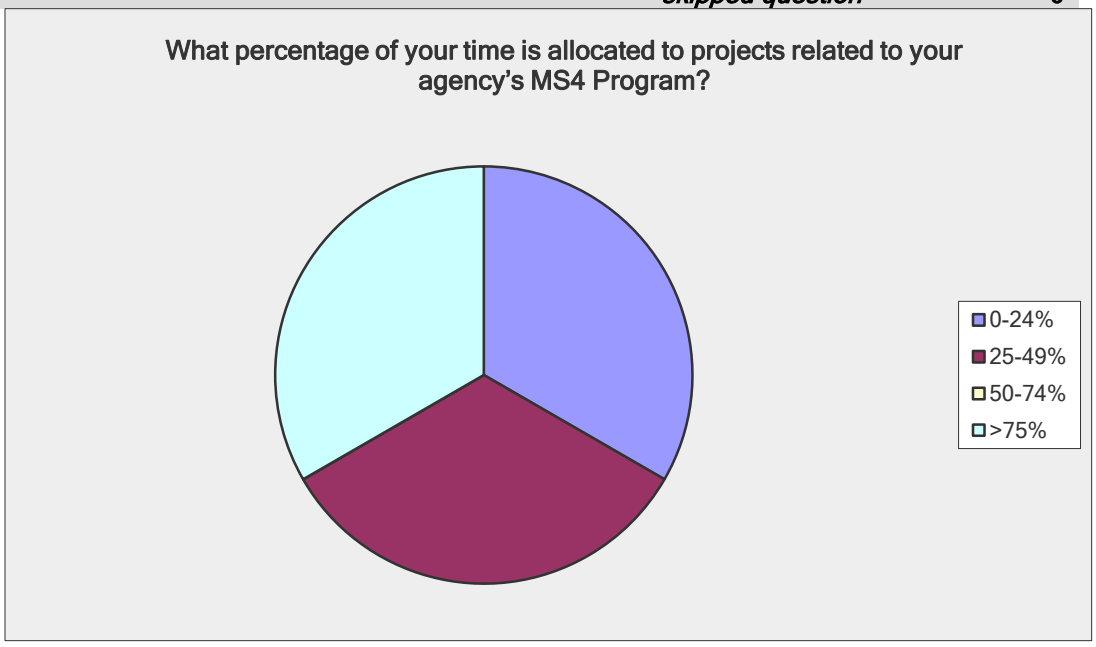
What is your role in the transportation MS4?		
Answer Options	**Response Percent**	**Response Count**
Senior Level Manager	0.0%	0
Program Manager or Coordinator	83.3%	5
Program Support	16.7%	1
Third Party Consultant	0.0%	0
Other (please specify)		0
	answered question	6
	skipped question	0



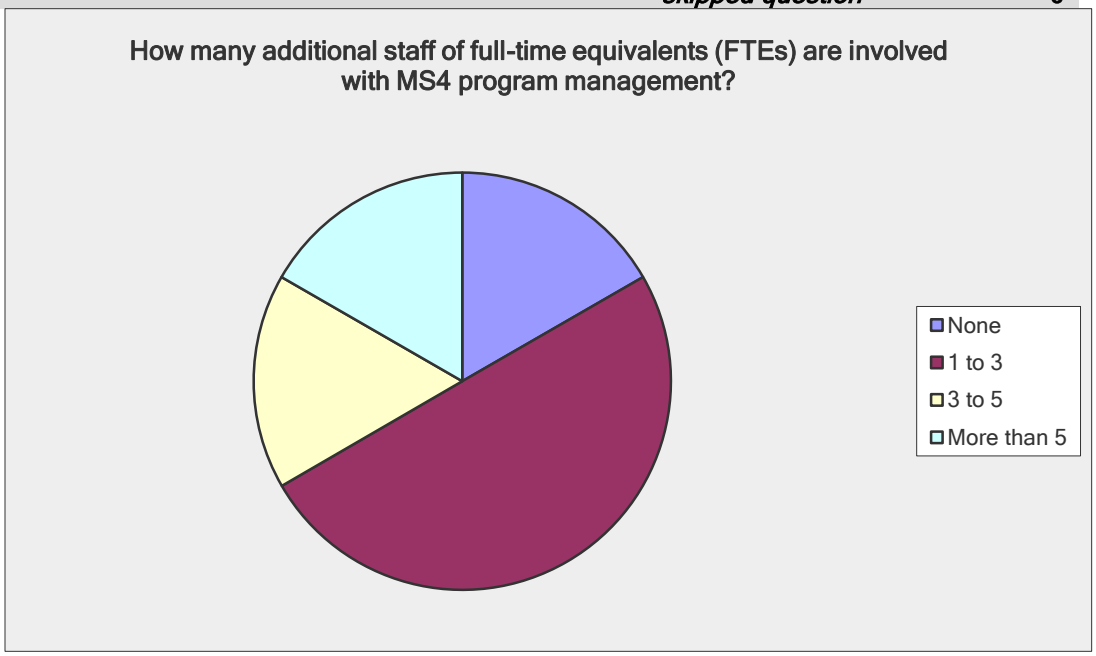
How long have you served in your current position?		
Answer Options	**Response Percent**	**Response Count**
0 - 5 years	33.3%	2
6 - 10 years	33.3%	2
11 - 15 years	16.7%	1
>16 years	16.7%	1
	answered question	**6**
	skipped question	**0**



What percentage of your time is allocated to projects related to your agency's MS4 Program?		
Answer Options	**Response Percent**	**Response Count**
0-24%	33.3%	2
25-49%	33.3%	2
50-74%	0.0%	0
>75%	33.3%	2
	answered question	6
	skipped question	0

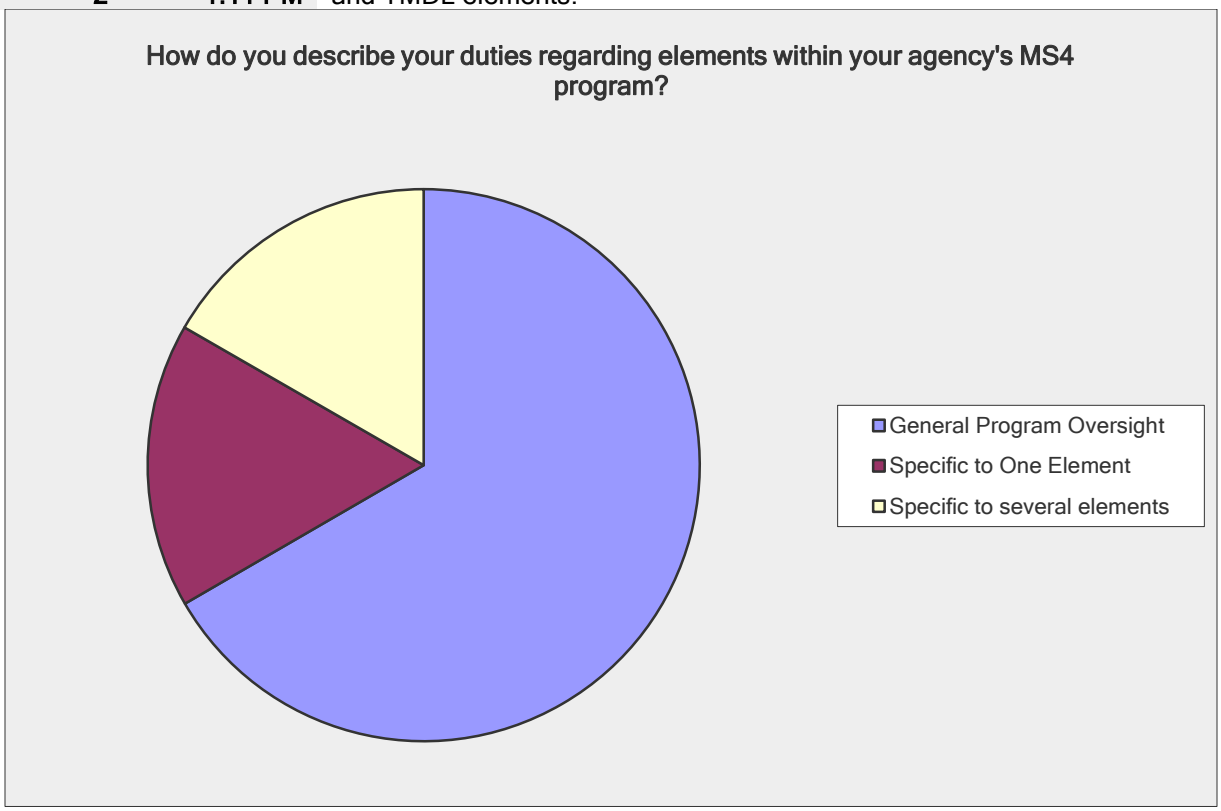


How many additional staff of full-time equivalents (FTEs) are involved with MS4 program management?		
Answer Options	**Response Percent**	**Response Count**
None	16.7%	1
1 to 3	50.0%	3
3 to 5	16.7%	1
More than 5	16.7%	1
	answered question	6
	skipped question	0

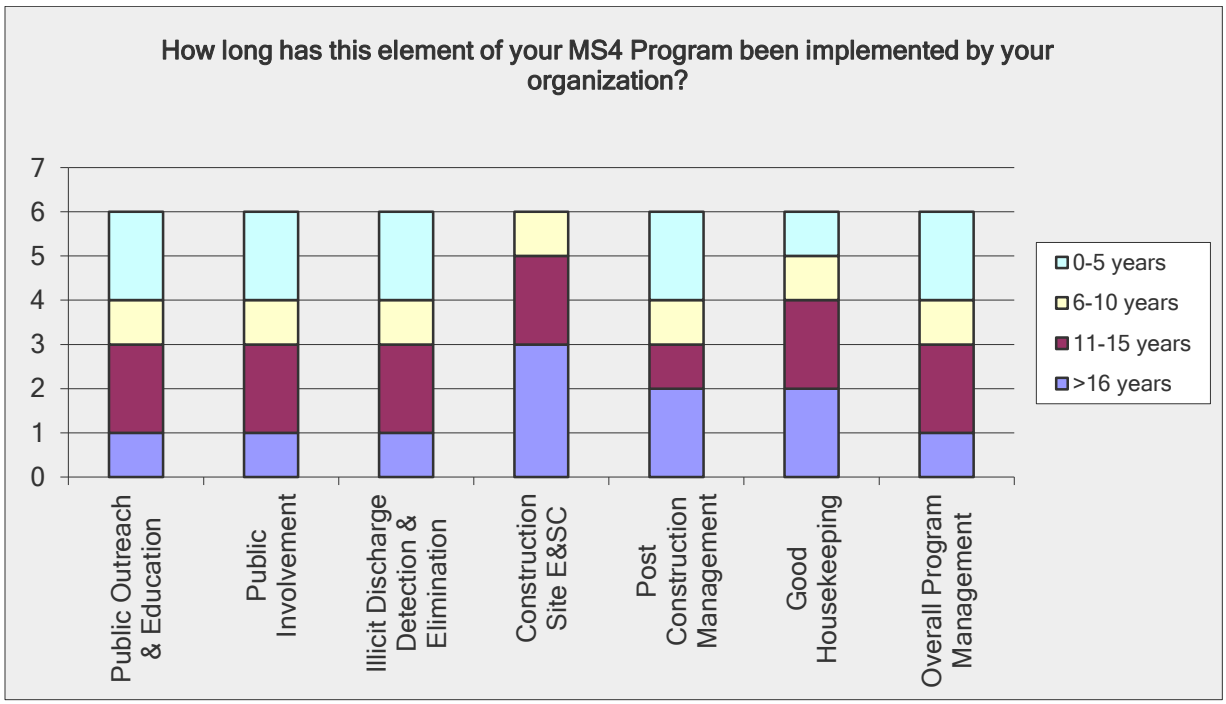


How do you describe your duties regarding elements within your agency's MS4 program?		
Answer Options	**Response Percent**	**Response Count**
General Program Oversight	66.7%	4
Specific to One Element	16.7%	1
Specific to several elements	16.7%	1
If specific to one or several elements, which one(s)?		2
answered question		6
skipped question		0

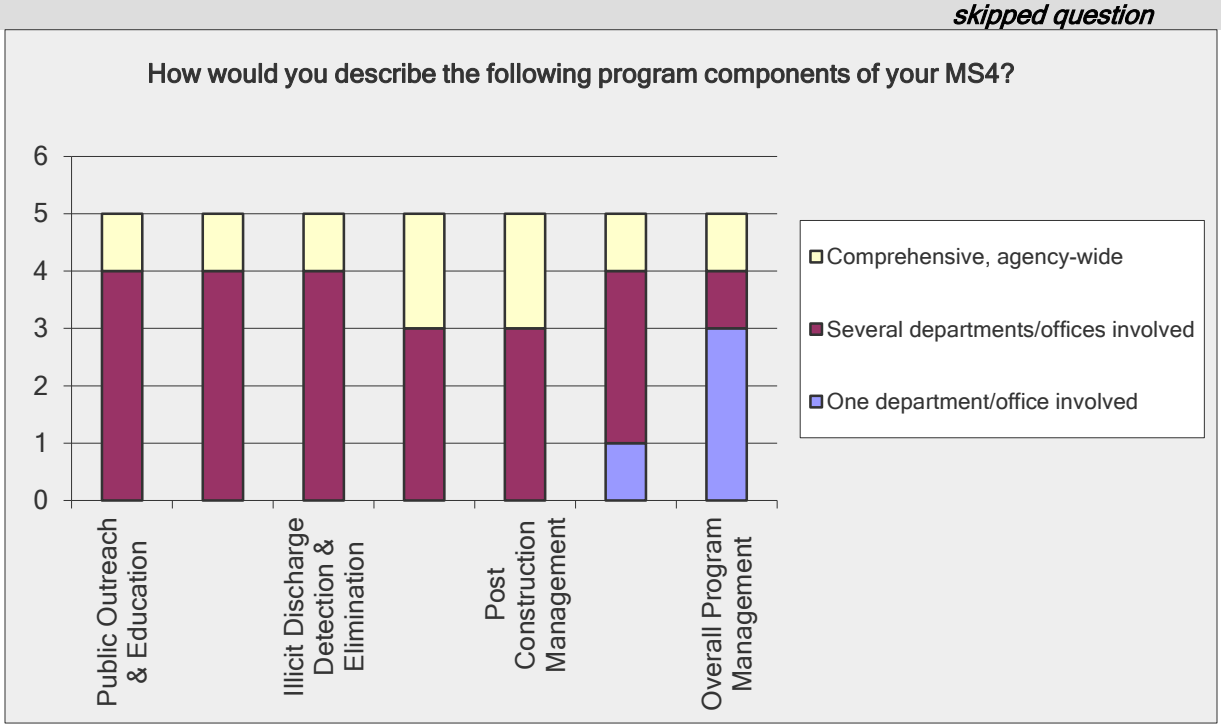
Number	Response Date	If specific to one or several elements, which one(s)?	Categories
1	Aug 2, 2014 2:12 PM	construction	
2	Jul 28, 2014 1:11 PM	Permit writing, oversight of the pollution prevention and good housekeeping and TMDL elements.	



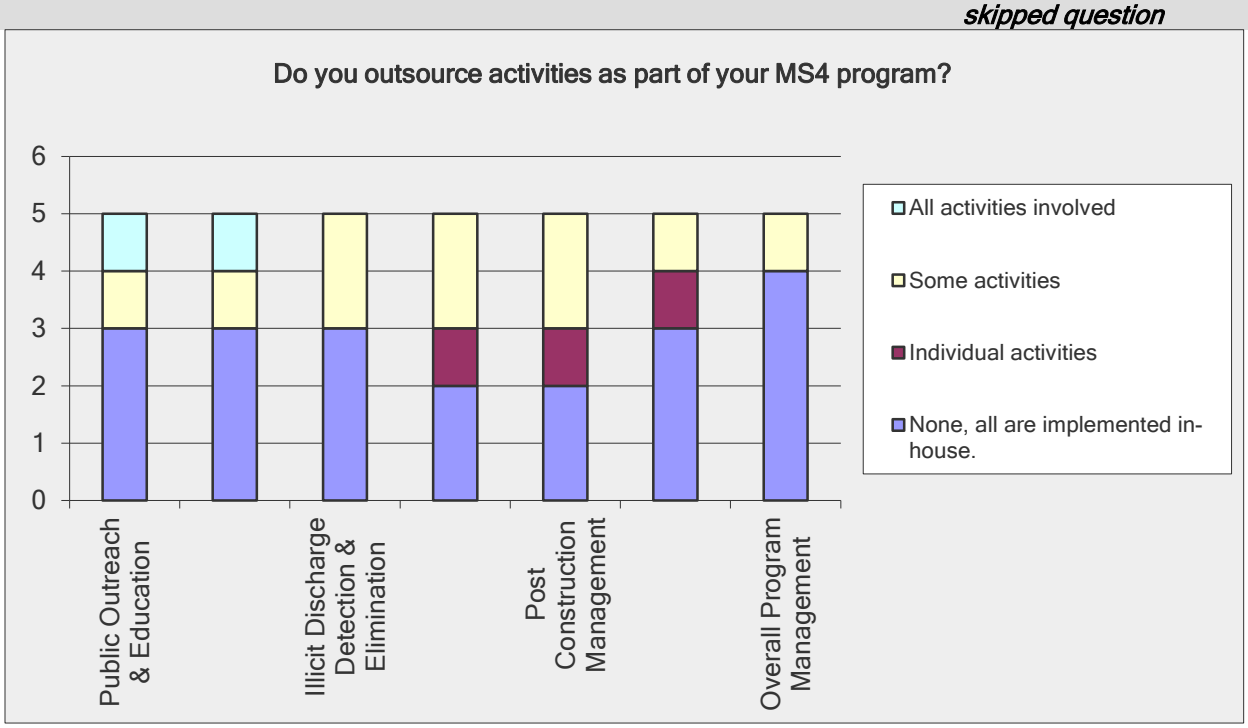
How long has this element of your MS4 Program been implemented by your organization?					
Answer Options	**0-5 years**	**6-10 years**	**11-15 years**	**>16 years**	**Response Count**
Public Outreach & Education	2	1	2	1	6
Public Involvement	2	1	2	1	6
Illicit Discharge Detection & Elimination	2	1	2	1	6
Construction Site E&SC	0	1	2	3	6
Post Construction Management	2	1	1	2	6
Good Housekeeping	1	1	2	2	6
Overall Program Management	2	1	2	1	6
				answered question	6
				skipped question	0



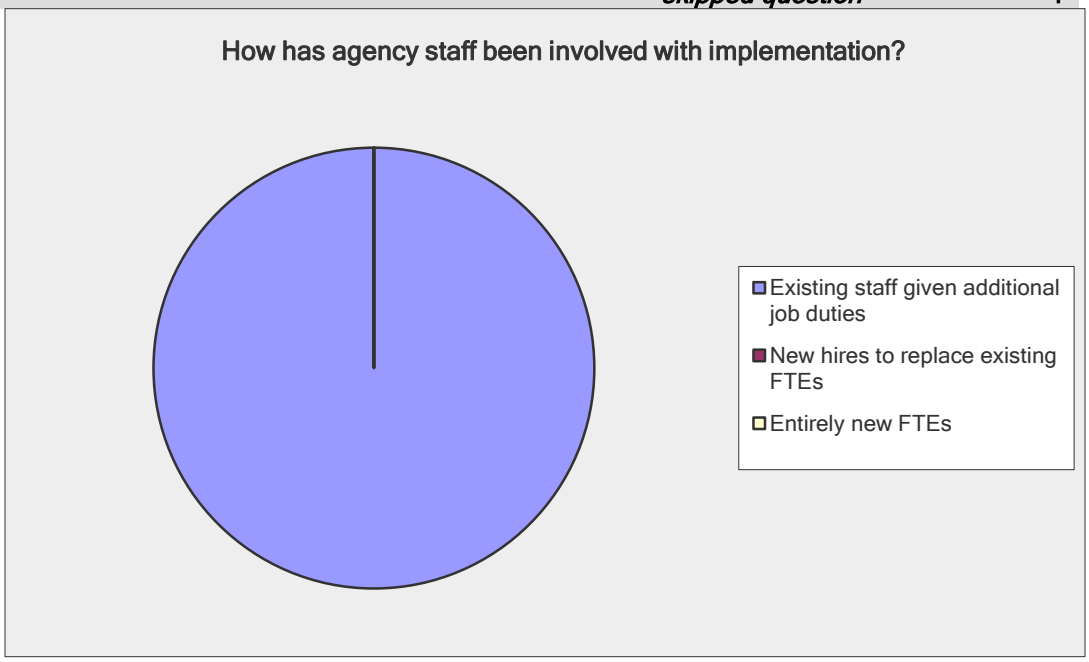
How would you describe the following program components of your MS4?				
Answer Options	**Comprehensive, agency-wide**	**Several departments/offices involved**	**One department/office involved**	**Response Count**
Public Outreach & Education	1	4	0	5
Public Involvement	1	4	0	5
Illicit Discharge Detection & Elimination	1	4	0	5
Construction Site E&SC	2	3	0	5
Post Construction Management	2	3	0	5
Good Housekeeping	1	3	1	5
Overall Program Management	1	1	3	5
			answered question	5
			skipped question	1



Do you outsource activities as part of your MS4 program?					
Answer Options	**All activities involved**	**Some activities**	**Individual activities**	**None, all are implemented in-house.**	**Response Count**
Public Outreach & Education	1	1	0	3	5
Public Involvement	1	1	0	3	5
Illicit Discharge Detection & Elimination	0	2	0	3	5
Construction Site E&SC	0	2	1	2	5
Post Construction Management	0	2	1	2	5
Good Housekeeping	0	1	1	3	5
Overall Program Management	0	1	0	4	5
				answered question	5
				skipped question	1

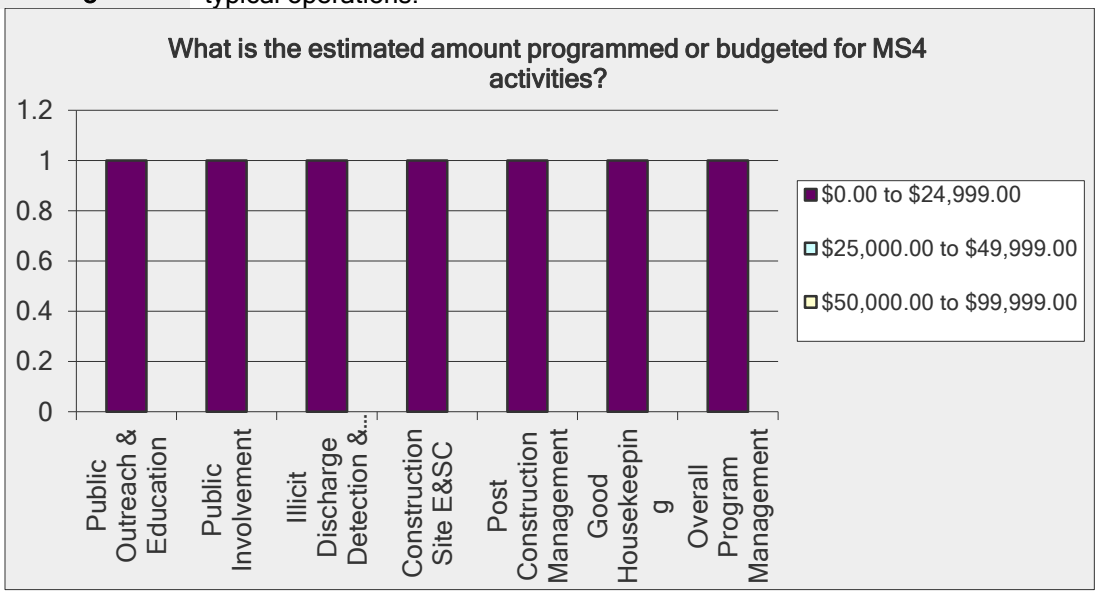


How has agency staff been involved with implementation?		
Answer Options	**Response Percent**	**Response Count**
Existing staff given additional job duties	100.0%	5
New hires to replace existing FTEs	0.0%	0
Entirely new FTEs	0.0%	0
Other (please specify)		0
	answered question	5
	skipped question	1

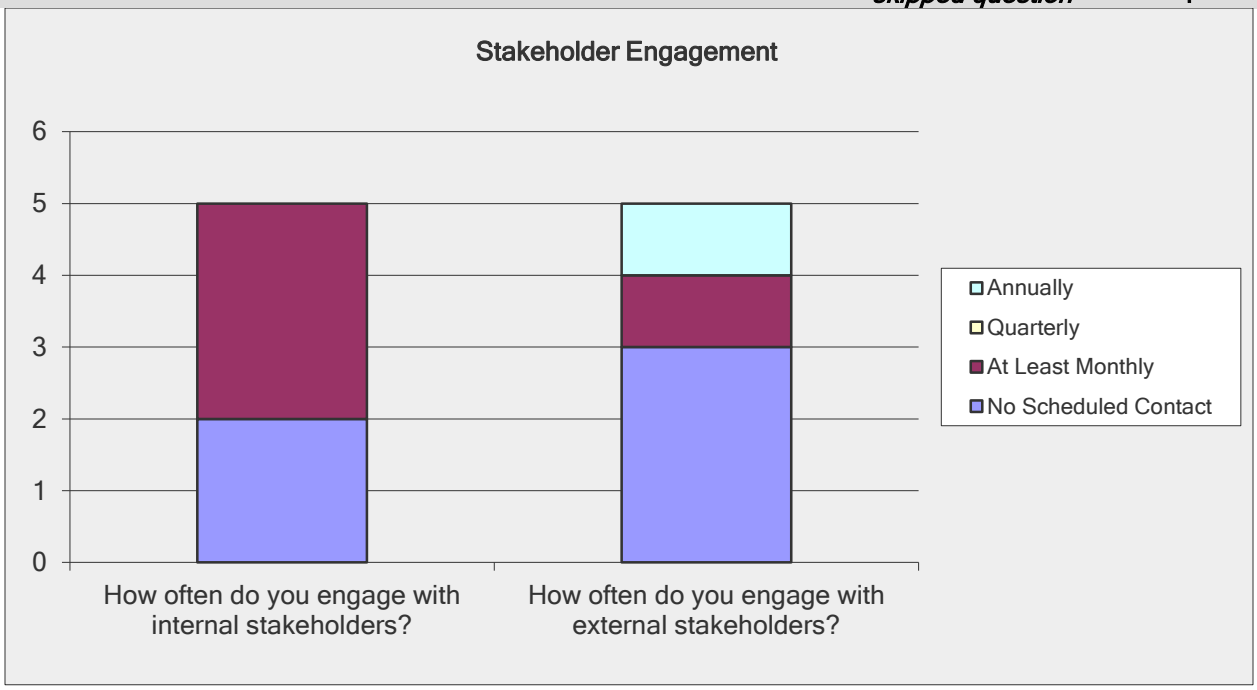


What is the estimated amount programmed or budgeted for MS4 activities?						
Answer Options	**$0.00 to $24,999.00**	**$25,000.00 to $49,999.00**	**$50,000.00 to $99,999.00**	**$100,000.00 to 499,999.00**	**> $500,000.00**	**Response Count**
Public Outreach & Education	1	0	0	0	0	1
Public Involvement	1	0	0	0	0	1
Illicit Discharge Detection & Elimination	1	0	0	0	0	1
Construction Site E&SC	1	0	0	0	0	1
Post Construction Management	1	0	0	0	0	1
Good Housekeeping	1	0	0	0	0	1
Overall Program Management	1	0	0	0	0	1
Other (please specify)						3
					answered question	1
					skipped question	5

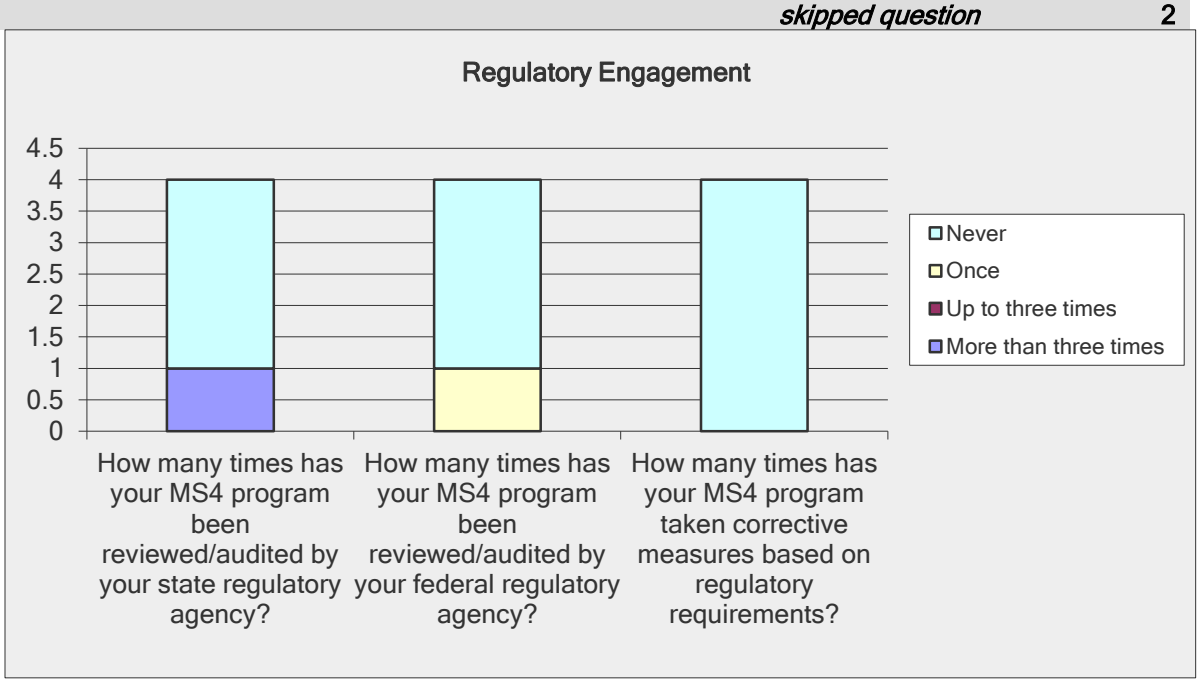
Number	Other (please specify)	Categories
1	no specific budget for stormwater, expenditures allocated to other budget items	
2	There is nothing specificially programmed or budgeted for MS4 activities.	
3	$3 million annualy to cover MS4 program management and items not considerd a part of typical operations.	



Stakeholder Engagement					
Answer Options	**Annually**	**Quarterly**	**At Least Monthly**	**No Scheduled Contact**	**Response Count**
How often do you engage with internal stakeholders?	0	0	3	2	5
How often do you engage with external stakeholders?	1	0	1	3	5
				answered question	5
				skipped question	1



Regulatory Engagement					
Answer Options	**Never**	**Once**	**Up to three times**	**More than three times**	**Response Count**
How many times has your MS4 program been reviewed/audited by your state regulatory agency?	3	0	0	1	4
How many times has your MS4 program been reviewed/audited by your federal regulatory agency?	3	1	0	0	4
How many times has your MS4 program taken corrective measures based on regulatory requirements?	4	0	0	0	4
				answered question	4
				skipped question	2



Appendix 5: Information Session with Barry Fagan

Monday, April 28, 2014
Iowa DOT Headquarters, 800 Lincoln Way, Ames, Iowa

Attendees:

Name	Division
Greg Mulder	Office of Construction
Melissa Serio	Office of Construction
Dung Ta	Office of Design – Urban Section
Bob Younie	Maintenance
Jesse Tibodeau	Districts
Doug McDonald	Districts
Mark Masteller	Design - Roadside Management
Scott Marler	Environmental
Deanna Maifield	Office of Design
Jim Schoenrock	Design – consultant review
Steve Seivert	Prelim Bridges and Structures
Linda Narigon	Research
Dave Little	District 2 ADE (by phone)
Rebecca Kauten	UNI
Elijah Gansen	Office of Design

TAC Committee Session

Bob Younie – State Maintenance Engineer

1,000 maintenance staff, 6 districts. Autonomous leadership among districts.

Serves on the Iowa Highway Research Board, Iowa DOT Research Advisory Committee (REC) – advisory committee for federally funded research ($6 million total)

"Policy & Persuasion"

Melissa Serio – Office of Construction Materials

Experience during graduate school on I-235 project.

Resource office for construction field offices at district level. 13 construction field offices in the 6 districts.

"Policy & Persuasion"

Administer all construction permits under general CGP (30 or more, could cover multiple projects under one permit.) NOI/NOD reports, technical training and certification; newly established program for ESC in specs last fall as a requirement for contractors. Lower level is web based – weekly inspector and prime contractor are required (90 minutes, no exam). Upper level, 2 day certification – one per DOT field office, one per prime contractor by organization, exam required. Training season is December to April. 2013 – approximately 250 certifications over the course of the calendar year.

Design training has not been established to date. Focus has been on inspectors and technicians. Barry mentioned he is working on designer training that will roll out in the coming months.

Rebecca Kauten - University of Northern Iowa

Barry Fagan - ALDOT Environmental Program Manager

Experience in construction bureau. 2010, led the effort to coordinate all environmental programs within the agency. Engages with partners, environmental groups, and work to address concerns from within the agency. Most of the program focus is water quality. There is not one dedicated person for the MS4 program – it is distributed across divisions/bureaus. Does not consider this an ideal situation. A larger office to manage all environmental programs may be more appropriate. Management currently sees the

focus of having it be "everyone's job," yet it is also no one's job. Reports directly to chief engineer.

Previously considered a co-permittee with four other MS4s, but chose to develop their own as an agency. The approach was proactive, with the idea that the approach was better than having an agency make the decision for you. The results are imperfect, but the goal is to improve every day.

Linda Narigon – Office of Research

Background is in wastewater, sanitation, drainage design. Bridge design and drainage in 1990s; floodplain mapping; standards.

Develop need statements for research projects to be funded through state and federal funding sources.

Elijah Gansen – Office of Design

Background began in college with construction, ESC inspection, private industry in stormwater and sanitary, drainage district design, compliance and permitting.

Currently working on storm sewer design, roadsides coordination for seeding, BMP location/implementation. NOI and permit coordination with Melissa prior to project letting.

Q: Are you looking at post construction calcs for runoff?

A: Generally not looking at recharge/detention at the present time. (EG)

A: Iowa DOT has done post construction design on a handful of projects (MM, BY), there has been effort to capture runoff and treat in select areas (golf course, Highway 20/Iowa River), but not universally. Iowa DOT allows others to implement. In either case, there is no maintenance or performance monitoring. Some were permit requirements (401/404), some were requests of the locals, some were proactive on DOT's part.

Mike Heller – Office of Design

Five years with Corps of Engineers (Red Rock), Conservation Boards,

Currently designing BMPS for ESC; seeding, fertilizer, ESC technician course.

In-house design review and recommendations, BMP inclusion; Stand-alone permit ESC projects (temporary vs permanent), with the intent of securing a better contractor for better quality implementation. Permits kept open until after permanent stabilization.

Large projects could remain open for many years. Also bridging the gap between what is designed and what gets built.

Project Overruns – Director's interest is staying within the budget. The challenge that exists is designing, installing, maintaining and replacing practices that are hit with three inch rainfall events in 24 hours on a regular basis.

Q: What rainfall event should practices be designed to manage?

A: EPA recommendations in last go-round included language that drives the Q2 storm event incorporated with BMPs.

Q: Is there a way to get involved with design earlier in the process as a way to incorporate more ESC earlier in the process?

A: Post construction and stormwater is typically an afterthought for most DOTs. Florida has a "pond analysis/evaluation" process when calculating ROW and reviewing plans. Coordination is between design and construction. The goal is to get the process moving forward earlier.

Q: Do you design your BMPs for ditch control/shear stress?

A: Yes. The permanent lining is typically seed/mulch/RECP. Try to get lining in as soon as possible, and get ditch checks in shortly thereafter. Designers select linings based on anticipated shear stress. Temporary may be on Q2 storm. Permanent could be Q25, Q50 or more.

Future planning needs to incorporate risk more than current approach.

Mark Masteller – Office of Design

Heads up roadside development, parks, rest areas, Living Roadway Trust Fund – everything outside the shoulder.

Back in 1990s, early days of stormwater permits, asked DNR what requiements would be for DOT. At the time, the agency was not a priority for the agency. Have been operating under same pretense ever since.

No single office that manages stormwater. Have been lots of improvements due to coordination.

Iowa Stormwater Technical Committee – three entities with jurisdictions: State Technical Manual, SUDAS (urban design and specs), DOT design guidance. Working to coordinate all three and ensure consistency in language, as well as implementation. Tracking EPA/AASHTO stormwater issues.

Manuals are not required within the current stormwater permit. Local systems adopt SUDAS, Federally funded projects require DOT specs. State stormwater manual is not developed as a transportation guide.

Mary Kay Solberg – Office of Location & Environment (OLE)

Historically there were fixed stormwater permits for every single maintenance shop, based on industrial MS4 permits. DNR no longer required, but eventually these will likely be required again. SPCC plans cover some drainage. Unofficial policy is to protect surrounding property.

Involved with planning, implementation and maintenance. Having funding to follow through on these commitments makes all the difference.

"Protecting the Environment is Everyone's Job" has been a difficult sell. It's not written into anyone's job description.

Q: Audits?

A: University of Northern Iowa Waste Reduction Center has audited sites and found a high level of compliance. RCRA issues were mostly what needed to be addressed.

Q: NEPA?

A: Mostly determined by DNR or others identifying environmentally sensitive areas. ALDOT has had groups look to the NEPA process to require ALDOT to comply. It's an area of risk for ALDOT for future planning. FHWA and Corps of Engineers are being brought in on a recent lawsuit in Alabama.

In Iowa, the major focus of environmental activist groups is the agricultural industry. The volume of water must be handled, but the "non-regulated run-on" is a challenge. ROW purchases may need to incorporate buffer strips and larger purchases to facilitate.

Q: What defines "pollution?"

A: ALDOT contacts property owner, indicates they will contact the regulator of the impact creating potential non-compliance. "We are not responsible for that dirt….we know it's there." We made you aware of the situation, but we cannot regulate.

"We are not a municipality, therefore we cannot regulate in the same way an MS4 can."

Monitoring for construction is based on background data as reference.

MS4 monitoring plan is going to focus on impaired waters and monitor accordingly. "Is that something that could come off an ALDOT property. If so, we will monitor

upstream/downstream using multi-parameter sondes for six months. Focus will be on "priority sites" and rotate as needed to measure impact.

Q: Is there something that should be done as new maintenance garages as a way to take this into account? (BY)

A: There are things that can be incorporated now.

Outcomes:

1. Initially educating stakeholders on what other states are doing.
2. Hear first-hand what stakeholders do, and how a transportation MS4 can impact.

Subgroup Session Notes: Design

Attendees: Jim Schoenrock, Elijah Gansen, Mike Heller, Mark Masteller, Bob Younie, Dan Harness

Dan – Methods Section.

Develop automation, design manuals, standard road plans and details

Roadside/guardrail and legal

Jim – Consultant Coordination and Plan Quality.

Quality Assurance on projects

Barry – ALDOT

Iowa DOT is in a good spot regarding development of a plan for an MS4.

ALDOT – co-permitee with four MS4 communities. Annual reporting was the basic responsibility, alontg with four annual samples within the communities from a designated location.

As environmental compliance evolved, so did the programs. If someone had experience, the task was delegated accordingly. As a result, Design was tasked with permitting and MS4 documentation.

Five years ago, there was little activity related to MS4 compliance. One county/co-permittee was audited by EPA. ALDOT was brought along in the process as a result. "Office of Environmental Coordination" was established.

Phase II MS4 program roll-out included public comment. It became evident ALDOT did not have the same regulatory authority as a municipality. Full compliance with a municipal MS4 permit was not feasible.

"We are not willing to agree to do on paper anything we know we are incapable of doing." We established our own permit.

Definition of MS4 does not fit transportation agencies well. It is intended to address pollutants from urban areas. The hook is that we as agencies own land within these urban areas.

It did not fit, but we realized we have environmental responsibilities. We engage in activity that could impact the environment. There is an expectation from our neighbors we need to honor and address.

Principles of ALDOT MS4

- We are not a municipality and we refuse to be regulated as such
- Will not agree to do anything we are unable to do
- We are interested in our environmental impacts and we are willing to do what needs to be done.

Educate the regulator along the way.

Consortium of environmental groups, educating them on the functions/need as well as limitations of a transportation MS4.

18 month process from inception to implementation.

Mere compliance is not as secure as we think it is. If you are just checking boxes you probably aren't doing the best job. We shouldn't aim for a C-minus grade. If we live at that level, one shortfall can sink us. We've got to build ourselves a cushion beyond mere compliance. That includes relations with regulators and environmental groups. It can establish some grace that may not be afforded you otherwise. Once viewed as "human," it was acceptable that mistakes were made.

Recommendation: We want to build a stormwater program so that when the day comes a permit is required, we are doing things in a manner that shows we care. We will be a part of the process, but we will lead the way and educate others in the process.

What are some of the things that scare you?

Budgets breaking.

There are FHWA funds to build, but not maintain practices.

Construction stormwater costs for ALDOT is 3-5% of total project budget on

temporary controls. This is an increase from 1-2%. Special projects could increase to 10-15%.

Staffing – now we will have to get people trained on what to do, then how.

There may be things underway today that can help curb costs.

How do we get consultants aligned?

Staff training. Someone will have to write design guidance.

Education may start from scratch, but not necessarily every product.

Post construction – water quality and water quantity. Remove pollutants, mitigate hydrologic impacts. Filtration/infiltration practices.

ALDOT focuses on managing 90% of runoff. Permit says we have to mimic pre-development conditions. Promoting low-impact development practices and green infrastructure versus ponds.

Filtration practices – hardscaped concrete hydrodynamic separators, sand filters?

Shooting for vegetation and benefits already existing plantings.

Soil Quality Restoration (Iowa Stormwater Management Manual) – If you have uncompacted soil, you will infiltrate the 1.25 inch rain event. Double it and you will handle the water quality volume for the entire ROW. Infinitely cheaper and more feasible than designed practices to be installed. HDS systems may be better suited for ultra-urban areas where the ability to infiltrate does not exist.

Maximum Extent Practicable – mimic pre-development hydrology. Do a true, honest effort and defend it accordingly. If it is done in earnest, it should be acceptable to regulators.

Training – initially construction stormwater. Now moving to design. Also brought in NC State researchers to talk about post construction and low-impact development. Recommend general training for awareness. Let's get accustomed to the terminology and raise the comfort of talking about it – as a way to help facilitate discussion when policy development occurs.

SUDAS –an existing resource that includes a few items already. We just don't have the experience municipalities have. Plus, DOT is a different animal from municipalities. Some LID practices are not scalable or maintainable for DOTs.

Alabama has a LID manual developed by landscape architects. Bioretention has vegetation that is not maintainable by ALDOT systems.

Q: Do you have/use standard details for post construction?

A: Referred to the North Carolina design and maintenance manual

Q: Public Education: Is there a stormwater component to public meetings and comment periods?

A: There should be. Recently it has been added for projects where water quality is a concern.

If you can create a stormwater feature that creates community value, it is success.

Ditches – Some areas there are minimal ditches to avoid taking additional ROW. Previous directors would have supported purchase of additional ROW for environmental protection. Current management promotes reduced spending to the maximum extent practicable.

Florida has two sets of ditches. One is pre-treatment for the second.

One ALDOT project that had major environmental problems justified the purchase of additional ROW. We rarely consider long term cost and risk. Can we construct it without cause for concern.

Construction and maintainability should be considered in conjunction with cost.

Currently 5-10 foot of need line beyond ROW necessary for roadway design in Iowa. Intent is to buy as little ROW as possible.

Thinking about where to locate stormwater may expand this area.

DOT can purchase mitigation ROW. 404 permit purchases are separate, but go along with the project. Ownership ultimately is transferred to a local entity.

DOT does not do borrows anymore. Contractors are required to find the fill. Results are yet to be determined. July 2013 this policy was enacted.

(Maintenance for post construction practices may ultimately be transferred to local entities.)

Q: Are you considering more retention/detention to slow water down?

A: Detention is the first response from designers. The goal is to move into more diverse practices. i.e. making the water take a longer path to the discharge point can fulfill water quality requirements. We don't want detention ponds all over. There are environmental and maintenance issues that come with each one. Peak discharge should be eliminated.

We have lawsuits saying we were at fault for blowing out other practices. It is hard to prove no impact on hydrology. ALDOT is sticking to zero increase in peak discharge. Volume is still a challenge. It is allowed, as long as the increase has lag time in the hydrograph.

For streams, Iowa post construction follows a channel protection volume criteria for managing volume.

Chlorides may be a future concern.

Existing instructions on how and when to apply chlorides. Fiscal constraints were the driver. GPS systems are in place.

If you get to the point of having a permit, take credit for those things already in place.

Monitoring program may be a good starting point to know what leaves a DOT site.

Q: Existing stormwater sampling – upstream and downstream. Are you collecting from ditches?

A: Both. Construction permit requires knowledge background color, 50 NTU or substantial color change is the requirement.

Monitoring also on a post construction, long-term scale. If you have an impact, then focus there. Are some things impacted or not?

Street sweeping samples are already being monitored.

Soil samples may be an option. The vegetation in place may hinder transport to the water body.

Ditch sampling – during construction: driven by impairments. Where required, grab samples when possible. Post construction: grab samples from ditches, now looking to upstream and downstream.

There is no dedicated funding source for the ALDOT MS4 program. Did not end up in the permit. Some states do have dedicated funding sources.

Storm sewer discharge will be changing from current practices, which is minimal.

Subgroup Session Notes: DCE/REC/Tech

Attendees: Lee Shepard, Mark Dunn, Jesse Tibedeaux, Danny Steenhard, Elijah, Mike, Mary Kay

Lee Shepard – Tech supervisor, manages office with RCE

Mark Dunn – Performance & Technology, moving to Marshalltown RCE

Jesse Thibedeaux – District 1 DCE

Danny Steenhard – Con Tech

Doug McDonald – District 6 DCE

"The good news is you are already doing the work."

You do have environmental responsibilities, because of the potential impacts from the way you build your roads and bridges. If you want to fulfill your mission you need to honor these responsibilities.

18 month process to develop MS4 for ALDOT.

You have an opportunity to build a water quality program that fulfills the MS4 requirement, and do it your way.

You can't write tickets, you can't create ordinances. You don't have a lot of the authority that MS4s have.

The good news for the Office of Construction is you already have an active construction permit to manage stormwater. That should minimize your overall impact.

Post construction means you may see features in your plans where you will be building these practices. Rather than send water away, you will be retaining and infiltrating. This will be a bit of a cultural shift.

The goal of post-construction is to knock the peak discharge down to minimize the impact.

We put in rock checks and rock flumes to manage velocity. But now think about reducing the rate and or volume of water leaving the site.

Eventually these decisions will be made to develop an MS4. Being in the driver's seat is a good place to be.

By regulation, you are responsible for being a part of municipal stormwater programs. In that sense, DOT is regulated by MS4 requirements. They may not be enforced today, but it could be. If EPA were to review a city's program where DOT projects exist, Iowa DOT could be brought into the process.

The Tennessee MS4 permit covers every mile of road in the state that they manage. ALDOT made the argument that the regulatory obligated to roadway and support facilities within the existing MS4 framework.

We are not a municipality and refused to be regulated as such.

One person negotiating a statewide transportation MS4 permit may not fully grasp the impact on other divisions.

We want to understand what our impacts are. Target true problems with real impacts.

Transportation may not be the largest polluter, but there is still an impact.

If you meet the intent of regulation prior to a permit, you will likely come out ahead.

Q: Was the CGP already including monitoring or training requirements?

A: No. It was part of the negotiations, but we had it in place – looking as though going above and beyond regulatory requirements. In doing so, there was opportunity to negotiate for some of the monitoring requirements. The focus was on more practical data collection.

Some impairments are not originated on ALDOT property. Monitoring and sampling should not be necessary as a result if it could not be sourced to a transportation facility.

1100 people trained per year. 4400 total employees. Since 2002, certified all construction staff with an 8 hour course, exam and4-hour annual training on stormwater inspection. 2 hours now in classroom, 2 in field. Counties and other regulated groups encouraged to attend. Contractor training has been a struggle. ALDOT does require a QCI on site, but training is provided by others.

Impaired waters related to sediment could be a driving force in greater monitoring activity, "enhanced BMPs" and addressing environmentally sensitive needs.

Outstanding Iowa Waters require individual stormwater permits: Iowa Great Lakes, trout streams, karst topography

Are we doing testing? Highway 20 in 2000 included a full suite of parameters. Consultants were monitoring monthly and after triggered rain events. Preemptive baseline data also has been collected on other projects.

Recent testing has been to establish methods.

ALDOT interest in post construction was in some ways intended to mitigate the potential threat of damage/blowouts. The Alabama Handbook for sediment and erosion control serves as the guideline, using the Q2 storm. The range is 4.5 to 10 for Alabama.

Iowa sediment basins get filled in and seeded if a permanent plan exists. If no plan exists, they tend to fill in anyway.

A basin skimmer may be required in the next permit cycle for the GCP.

Q: Constructability challenge of tighter ROW, perimeter controls and yet allowing room for the contractors to work. How do you build if there is no room for controls and contractors in the space? Is this a programmatic issue?

A: Yes.

Q: Do we need to push back for lack of space? – and this is a risk problem.

A: Throw utilities in and you have an even bigger issue. Temporary controls are at risk.

A symptom of treating stormwater as an afterthought.

Similar to developments in the wetland program, stormwater planning activities may evolve over time.

Q: Contractors bid on insufficient ROW, and then complain after the fact. Should training to contractors include guidance on recommended ROW dimensions, designing the plan and managing for it.

A: ALDOT designs the plan, but the director wants it outsourced. Permit coverage is transferred to the contractor, but ultimately as the landowner the agency is responsible. Not a fan, but that is the direction.

Larger projects have a pollution prevention plan, mostly for urban areas. No acre threshold unless defined by DOT. It is a key definition

One acreage threshold for reporting and regulation

New or reconstruction activity – didn't want to have to put in post construction for retrofits on a mass scale. Definition of "construction" was negotiated.

Q: Annual reporting: what is required for construction?

A: Inspection reports – made available upon request

Inspection frequency – weekly/7 days, triggered events @ .75 in 24 hours (can count as weekly) Inspect informally daily, formal inspections every 7 days. IDRs contain this information.

Most inspections are typed. Contractor signature is still needed – it is still printed.

DocumentExpress – if there was a way to integrate it would solve the problem.

Q: Adjustments to the training program?

Q: Are there changes in contractor activity following training activity? Generally bigger contractors are willing to innovate.

Q: Adjustments to designs or specs?

A: Appropriate ROW for implementing controls/practices as well as the project, utilities, etc.

A: Design has to play a bigger role in implementation. If it's built into the plan, it is more likely to happen.

A: Structures and Road Design work independently. Once final plans come together the disconnect becomes clear.

Coordination is key!

Non-contracted construction activity also needs to be accounted for.

Maintenance definitions may be necessary (ditch cleanouts, signage, etc.)

Q: Handoff between construction and maintenance?

A: Project acceptance phase – post construction field exam for pass/fail. The new process may cut down on future phone calls, complaints, concerns.

Maintenance also possibly a part of concept design field exams.

13 Resident construction engineering offices. RCEs have site inspectors

Subgroup Session Notes: Prelim Bridge & Maintenance

Attendees: Mark, Melisa, Steve Seifert, Elijah, Mary Kay, Bob

Steve Seifert – Prelim bridge. Primary role is protection of bridges and structures. Reliance is more on design for pollution prevention.

"Valuable Resources" can require runoff diversion from the bridge deck for splash basins and other methods of capturing runoff.

Disparate individual handoffs – a series of processes that converge on one general theme.

Q: Can the MS4 process help us work in more harmony with one another?

A: Yes.

The level of detail learned through this process is staggering. Nailing down who does what is a complicated process.

Q: From what you know now after two years of working on the MS4 project, based on what you've seen, what would be the best organizational structure?

A: Director is in a de-centralization mode. Strong district system is what exists here also.

Create a single environmental office that serves the districts. The responsibility is organizational integrity. One MS4, agency-wide permit. Guidance and services for districts. NEPA process, 401/404 permits, etc. may be outsourced or hire the central office. Create an office that houses environmental planning, hazmat expertise, stormwater, etc.

That fits departmental success. It maintains the program integrity and enables success.

Division stormwater coordinators – working in each district as a stormwater specialist. Serves as the qualified credentialed professional (QCP). Reports to DCE, sole job is active construction. There are project inspectors on each site. The stormwater coordinator reviews reports, participates in training, troubleshooting, etc.

Bridges and structures are not heavily involved in the MS4 process.

Q: Who is sizing for pipes?

A: Design does pipes. Bridges does drainage, mostly.

Q: Who would design an infiltration basin? Sediment basin?

A: Design. Bridges and structures will run the numbers for hydrology.

Design calculates for water managed within the system. Bridges runs calcs for water that flows through the system.

Q: Pre-post development hydrology?

A. Curve number applications are not done today. Hydrology uses regression equations. This will likely need to change in the future.

Q: Are there other housekeeping items related to bridges that are or should be done?

A: Designers should be informed.

Q: Handoffs between processes – lessons learned?

A: More communication is better. The more diverse the team (and there needs to be a team) the better.

Maintenance is where the lions' share of work and responsibility fall.

- Mapping major outfalls
- Defining what major outfalls are (>36 or equivalent) within MS4 areas
- GIS database
- Illicit discharge monitoring (every outfall in MS4 areas) once annually

Q: How do the permits co-mingle?

A: Co-permittee, the municipality has management authority. If you each have your own, you operate independently.

A good first step may be to assess/inventory existing MS4 community storm drain inlet/outfall data.

Q: Question to states – do you have a definition for outfalls? (Size criteria)

A: Consultants for mapping, screening, etc.

Bridge/Culvert inspections occur every two years. Maintenance is charged with the task. >20 feet is a bridge. Anything smaller is a culvert, with a minimum of 12".

Concurrent Jurisdiction: Iowa Code Chapter 150.

Q: Maintenance Management Manual – new IM for MS4?

1,000 people in maintenance.

Herbicide applications logged according to CWA requirements.

"Waters of the US" definition remains unconfirmed by the DNR. EPA and the Corps of Engineers are working to clarify definitions of water bodies, but the draft publication remains obscure.

Wrap-Up

Next Steps:

- Will there be action to support funding for an MS4?
- We need to figure out what is appropriate action and make recommendations to upper management.
- Are we required? No, but it's inevitable.
- You can drive that ship or be towed along.

How did ALDOT do it?

- No amount of money or personnel would allow us to comply as a co-permittee.
- If you have ROW within the jurisdictional boundaries, that city is likely to bring DOT in if they have regulatory issues with their own MS4.

Building Field Support

- All-star team of district maintenance engineers (10) for peer exchange
- Discussion of integrating within existing structure.

Was a new function source created for tracking time?

- Question for other states.

Increase in staff? No. All absorbed. Not good.

- New staff was added for construction stormwater coordinators
- EPA is looking for dedicated funding sources within state programs. There is a precedent set of not providing. (question for other states)
- You want the number to be low so you meet it every year.

What EPA is looking for in a program?

- Stormwater practitioner meetings (last week of July in DC)

Next Steps – Short Term

- Compile notes

- Cull out general topics, sub-group comments
- Questions for other state programs
- Send back to TAC for review

Next Steps – Long Tem

- Put together a stormwater management program in a proactive way
- Management isn't heavily steeped in the topic.
- AASHTO Synthesis
- Management level briefing, or next level higher, Highway Management Team
    - Here's what's coming
    - Here's our plan
- We need a strategy before going to management
- Activity Inventory:
    - Where do we think the responsible offices are for these activities?
    - Are we doing any of these activities already?

Appendix 6: FHWA Water Quality Peer Exchange Meeting

Monday, June 9 through Thursday, June 12, 2014

Nebraska DOT Headquarters – Lincoln, NE

Attendees:

Name	Agency
Mike Heller	Iowa DOT
Melissa Serio	Iowa DOT
Ron Poe	Nebraska DOR
Gabe Robertson	Nebraska DOR
Ashley Grossenbacher	Nebraska DOR
Brian Smith	FHWA – Resource Technical Team
Matt Sperry	North Dakota DOT
Parviz Noori	FHWA – North Dakota
Tom Huncovsky	North Dakota DOT
Amber Law	Colorado DOT
Tara Carson	Minnesota DOT
Brett Troyer	Minnesota DOT
Jason Van Nice	Kansas DOT
Melissa Scheperle	Missouri DOT
Melissa Maiefski	Nebraska – FHWA
Molly Lamrouex	Nebraska – FHWA
Nick Soper	Nebraska DOR
Gabe Robertson	Nebraska DOR
Carol Weinhold	Nebraska DOR
Mike Owen	Nebraska DOR
Jacob Kophamer	Nebraska DOR
Jason Jurgens	Nebraska DOR
Bob Carnazzo	Nebraska DOR
Randy Peters	Nebraska DOR - Director
Mike Owen	Nebraska DOR
David Lathrop	Nebraska DOR
Kevin Donahoo	Nebraska DOR
Tony Ringenberg	Nebraska DOR

June 9, 2014

General Notes:

- FHWA coordinated this "Midwest Peer Exchange" to discuss MS4 strategies in June, 2014. States included in this event: North Dakota, South Dakota,

Nebraska, Kansas, Colorado, Iowa, Missouri and Minnesota. The objective is to share knowledge and experience from various programs.

- As many as six different peer exchanges have occurred to date, including sessions dedicated to stormwater.
- Program Structure: most here are from Construction. Nebraska is Environmental.

Gabe Robertson, Nebraska DOR & Melissa Scheperle, Missouri DOT: Compliance Audits

- Inter-agency engagement is with nearly every division within NDOR.
- CTAG – compliance team within agency. (Hydrology, Communications, Construction) Important to have a cross-section communication strategy.
- NDEQ and NDOR leadership were initiators.
- Ron was able to add staff as needed. Able to petition when reached a work overload standpoint.
- Erosion Control design is in with Ron. Roadway Design – five review points where plans are exchanged for review. Used to be housed in Roadway Design. Iowa DOT receives plans shortly before going to contractors. There is little time to effectively incorporate/recommend changes to plans for any given project.
- Getting recommendations included in the design require more than thirty days prior to implementation. (THIS IS SOMETHING TO CONSIDER FOR IOWA MS4 PLAN)
- Five points are "supposed" to happen. Does not always occur for simple projects. If environmental issues or a complex project, Ron wants to see the plans as many times as possible.
- Second permit cycle for NE.
- MS4 and Construction are two separate permits.
- Contractor does temporary design, NDOR does permanent.
- NDOR recommends temporary BMPs, estimates quantities.
- MN DOT – we struggle to come up with accurate estimations.
- MN PCA allows for plan amendments. During ESC concept stage, contractor is required to come up with designs, with a two-week review period. Contractors sometimes lack the knowledge base to take on this responsibility. MN does lump sum for temporary erosion control. No other states do.
- Contractors tend to learn more when they are responsible for their actions. It's their own dollar being managed.
- MN DOT has a liaison between DOT and PCA. Reviews permits >50 acres, and drains to impaired or special water. Also have a liaison with DNR to streamline public waters permits. Wetlands person is a combined role with the agency who regulates. It helps streamline the process – fully DOT funded positions.

- NDOR is permitted only within other MS4 areas – when within their jurisdiction. Education is statewide. Post-construction is within MS4 areas only.
- NDOR wrote its own MS4 permit for DEQ. Made it transportation specific, and got DEQ to approve. "You don't have the time, what if we write it for you."
- MO General Permit covers entire state. Asking to scale back to MS4 areas. Only way would be to do site specific, not general. Nebraska's are all individual permits for each MS4, one template with the name changed for each location.
- NDOR Training Program – certifications stored in ECODatabase. Hosted for entire state. Live and online classes available through UN-L. Erosion Control Inspector, SWPPP Designer Course. Initially developed by Leo Holm and Dwayne Stenlund. Used to be a three-year certification, but it moved to five. ECODatabase sends out notices for re-certification and stores information. Is it better to cycle with the permit? The class covers contractors. District training is comprised mostly of DOR staff.
- Reciprocity with other state programs as an option? Concepts of stormwater management remain constant. Processes and procedures related to state requirements are what differ.
- Interim certification course can get a six-month certification, which will cover until someone can get to the full day course.
- North Dakota has oil, and contractors are requesting reciprocity because of the volume of out-of-state contractors operating in-state at any given time.
- Chapter 3 – permanent BMPs for post-construction. Process manual.
- Good Housekeeping/Maintenance Facility Training (spill prevention too). Online. Previously housed in Operations. Person and tasks (SPCC, HazMat included) now part of Environmental in NDOR.
- Inspection field staff for each district? NDOR – yes, part time. Colorado, yes. Michigan, yes.
- Compliance Technical Advisory Group (CTAG), division heads and key contacts. Quarterly regular meetings, stormwater work group meetings.
- District Environmental Coordinator Meetings, as often as possible.
- District Update/Training meetings – annually.
- Environmental Newsletter/website (quarterly updates)
- LTAP – implementing training programs.
- "Public" outreach/involvement: most education is internal. Primary public is internal. Staff and contractors. Secondary audience is more of the general public.
- MCMs 1 and 2 are combined for NDOR MS4 permit.

- Who leads stormwater team meetings for MODOT? Melissa. Gather input on documents, processes, get buy-in to take back to district.
- Iowa DOT – Design and Construction are the two offices running the stormwater effort. Not centrally coordinated. By rights, stormwater should be its own division because it touches every other division. Getting everyone to understand that is completely different.
- What was the catalyst? Consent decree for KDOT.
- Catalyst for NDOR – permitting process was not meeting DEQ requirements.
- IDDE – NDOR
    - Outfall mapping (interns) Getting the initial data points is the hard part. Once you have that, it's mostly about maintenance.
    - Dry Weather Monitoring (observational, maintenance)
    - District Incident Reporting Knowledgebase (DIRK) – spill reporting
- State statute defines responsibilities between municipal and NDOR MS4s. City outfall/inlet maps may be a starting point.
- MODOT has been informed that anything over 36 inches is considered an outfall.
- For ND and NE, every ditch is considered a water of the state.
- MN is working with UMN to get credit for water quality benefits of roadsides. Challenge is coming with the state, only granting credit for new practices and not anything existing.
- For IDDE, it's about the decisions and directives that led to the discharge. It's about getting people to understand the consequences.
- Construction MCM: ECODatabase
    - New Project Review Process
    - Inspection Reminders/Past Due Notices
    - New Reporting Features to Gauge Program Performance
- Are we over-using the term "plan?" We develop our plans to meet permit requirements, which include SWPPP components. The SWPPP is just a small part of the overall "PLAN." How do we get people to see beyond the basics and understand the larger framework in place?
- Environmental Commitments are part of the SWPPP. Not part of bid package. It's a supplemental document provided to contractors. Everything environmental is pulled out – all things environmentally related and documenting compliance. The plans and specs are in the bid package. The SWPPP does not include information on the contract for the project. Contractor is a co-permittee, and a list of amendments is provided. It includes 404 and other environmental compliance…all things NEPA.

- Who is the primary audience for the SWPPP? Is it the contractor? Is it the inspector? Is it the regulator? All of the above.
- If you are meeting your SWPPP requirements, are you meeting your MCM4 requirements as an MS4?
- Local projects – consultants are required to do bi-weekly and rain event inspections. District staff review and coordinate back with cities on inspections. Inspections are once during the life of the project, but also dependent upon the needs of the project.
- Construction is the most obvious, but other divisions of the agency (maintenance) play a critical role in implementing a comprehensive stormwater program. By being "in" construction (ND), the resistance comes more from the environmental side than the construction site of the debate. KDOT put the new position in the Office of Construction. That's where the money is and where the majority of the activity is located.
- KDOT is developing training for Maintenance. Outstanding permits got the attention of Maintenance. Training has to be adapted for the audience. They don't need the nitty gritty details on contracts and plans. They need to know what needs to be done, how to do, where, and how often.
- Maintenance yards in ND have industrial MS4 permits.
- NDOR – Post Construction MCM – Chapter 3.
    - Detail Sheets
    - Project Evaluation
    - Mitigation Options/Alternatives
- Take credit for what we're already doing. (NDOR)
- Long-term maintenance is going to be the biggest issue for post construction (FHWA)
- Mechanism for handing off to maintenance? Built in – documentation from Design, back to Environment. Into GIS tracking system, a form for treatment BMPs, maintenance related design guides. Currently all post construction inspections are done by Environment (NDOR). Will work with maintenance to get them up to speed and eventually hand off.
- Ponds: Can green sheets be passed through to maintenance? (MNDOT) Need for a feedback loop.
- NDOR – Good Housekeeping MCM – Facility Runoff Control Plan (FRCP), ECODatabase module for non-construction activities.
- ND has Dept. of Health, with four inspectors to cover the entire state. There lacks regulatory pressure to comply. All four, general permits, were written the same year. All are up for renewal this year.

- Iowa DNR has one central contact. Field offices are delegated for inspections. The number of municipal MS4s has kept DOT out of the limelight for compliance.
- Facility Runoff Control Plan – documentation to show what's already being done, and what's in compliance for the MS4 permit. Kept on site, reviewed by facility, as well as central office. Incorporated with ECODatabase.
    - Buildings/Grounds
    - Vehicle & Equipment
    - Product & Material Storage
    - Bulk Tank Storage
    - Waste Management

Tuesday, June 10, 2014

Director, NDOR – former division head, Randy Peters

"Whisky's for drinkin' and water's for fightin'."

8 Strategic Goals for NDOR, including environmental sustainability. This effort touches on all eight.

Stakeholder Collaboration – survey to ensure a positive experience.

NEPA Decision Making Process –

EPA Audits

- NE, limited experience with EPA. Small brushes. 2005 (initial)
- Mostly related to 404 inspections
- Learning from KS and consent decree process
- KS, ND, CO – consent decrees
    - $40,000, payable by contractor (ND), first offense with EPA
    - $500,000 payable by KDOT, three EPA inspections (2008 – initial, KC area)
        - 2010, revisited projects, saw similar compliance issues on site, Lawrence
        - 2012, Complaint called in on third project (Manhattan)
    - CO – closing out in current year
- MO has been through negotiations, working through final process for consent decree
- EPA inspections are handed to someone else who then writes the report.
- Don't have the site appear out of compliance from the road – this can help keep EPA off the site.
- DOT is the largest permit holder in the state for stormwater.
- EPA "hit list" for this year includes DOT.
- MN, 2010 metro district visited for MS4 inspection by EPA
    - Items called out were not part of permit. More of a "wish list."
    - Ended up in next permit.
    - PCA did not defend DOT
- If you are doing just the minimum, EPA will raise the minimum. But if you go above and beyond, the bar gets raised. Aim high, and expect the minimum.
- Minimum may be acceptable when impact is anticipated to be low.
- Timeline (KS): 2010 inspection started the consent decree process. Notice of potential violations, had 30 days to respond. Compliance order sent. Then

notified by DOJ of additional enforcement. Consent decree went into effect September of 2013.

- EPA files a complaint, then DOJ gets involved. Consent decree is next step in process.
- MN MS4 audit – metro district went into hyper mode. Central office has separate MS4 permit from metro. Hired consultant to rewrite program. Pages of recommendations. Nothing came out of it, no final report.
- Primary request was inspections beyond existing inspections. Q/A and audits of field inspections – regulate the regulator.
- IA – EPA inspections: September 2009 – bypass project. Report several months later. Notice of violations at that point, Jan/Feb, although no dollar amount. Response, then received dollar amount. Three prime contractors, lawyers, DOT lawyer. Overall, negotiated fine of $60,000. Negotiated share between contractors.
    - August, 2013 – EPA inspectors auditing Des Moines MS4. One week of inspections. One project, no violations. Notice of potential violation on another.
    - Inspections are subject to the individual inspector.
    - Minimal scientific background on determining sediment within a stream as a result of an adjacent project.
- Grading techniques vs sediment basins: depends on the scale of the site. Some contractors will include a "trap" during grading. Question came up related to design, drainage area and storage volume. MN has ditch check detail spacing that includes capacity and drainage for 2 year, 24 hour storm event. MN PCA was ok with these. CO and MO have design standards for sed basins. CO requires a riser pipe and specific outfall. Has not fully been adopted yet though (CO).
- Report received (IA) 3-4 months later. Has been ten months since report, has not progressed to date. Thinking there may be a follow up this year.
- "They've been here, and they found violations. It doesn't matter if it's one location or another. It's the DOT and it's your permit. And fines shouldn't be pushed off to the contractor."
- Negotiate the consent decree before you sign. The first option will always be the most stringent. They are willing to negotiate if you work with them.
- MO – over multiple years. Did not hear anything for more than a year after inspection.
- "Answer the question that is asked," when on an inspection site.

- Technically, anyone on a site can be asked for information about stormwater. Inspectors will inquire to whomever they can on a site. MS4 covers everything, so anyone is fair game for questioning. It's not left to specific point people or contacts.
- SWPPP – one is a plan and one is a program (MN). New MS4 program (as of last August). Much of the "new" work is documenting what is already being done. Document so it becomes efficient.
- MS4 is written for contained, urban areas. It is not intended for rural transportation systems. It doesn't make sense to fall under the general MS4 of existing, regulated municipalities.
- DOTs can't write ordinances, but they can write specifications.
- Utilities may be required for aligning municipal MS4s. BMPs required within state ROW.
- As long as DOT permit shows it is separate, utility contractors are responsible for acquiring their own permits for practices on state ROW for post construction.
- If a message comes from senior management, change is more likely to occur. "You need to listen to these guys," completely changes the game.
- Lessons Learned (KS/MO):
    - Pay attention to what happens in the adjacent consent decree states.
    - Progress in lieu of the consent decree (following first NOV) has helped. Likely not to see as many programmatic changes as a result.
    - Complaints are often driven by landowners. MO – driven by lakes and ponds. They now draw red flags on future projects.
    - Keep looking for and finding ways to get better, get information out and help folks understand what the objectives are. A consent decree has rigid guidelines, but the goal is still to get buy-in from others across the agency.
    - Importance of senior leadership buying into the process, the program, and policy.
    - Include DNR staff in your training. Invite them to attend.
    - Ron and Gabe presented recently to the state highway commission. When they see what the activities actually are, for many it's an eye opener that things are that highly regulated – and all the activities that gives rise to. It is a great feedback loop between the agency and elected officials. The congressional delegation does have clout with EPA.
    - Get AGC involved with training.
    - Not control your dust, not control your trackout, and not control your trash – these three things will get your site inspected. You may avoid a lot of inspections that way.

- Interagency liaisons – MN. Key point person for related projects. Disseminates information, identifies pressure points – instead of adding more layers of bureaucracy. Streamlines DNR requirements for DOT processes. Has created BMP documents that are accepted by DNR and implemented by DOT. PCA liaison is trying to do similar things. Reviews/inspects sites "as a PCA person," prior to an actual PCA inspection.
- In MN, PCA and DNR are totally different from a regulatory and management perspective. Regularly scheduled meetings occur between directors as a way to foster regular communication – not waiting until problems arise. CO meets quarterly with health department. Helps streamline processes and foster communication. Is this considered part of MCM 1 and 2? If not, it should be.

Ron Poe – AASHTO presentation on NDOR

- Environmental Section of Agency
    - Environmental Permits
    - Environmental Documents (NEPA)
    - Technical Documents (NEPA)
    - Roadside Stabilization
- Permit Coordination
    - MS4
    - NPDES Construction
    - Concrete Slurry (diamond grinding)
        - Allowed to discharge to foreslope (MN, ND) – barring any discharge to a water of the state.
        - MN internal study on impacts to vegetation.
        - Diamond grinding materials are not toxic. The pH level is the concern (11-12). Re-integration to soils is the crux of concern.
        - Agronomic rate, max of 5 tons/acre calcium carbonate application rate. (NE) Some gets trucked away. Some is discharged.
        - No general permit for MN, general guidance from PCA. Special provisional document for contractors. Requires a slurry management plan from contractors prior to implementation.
        - MO typically discharges to medians.
        - NE – permit by rule. No permit required, just comply with statewide rules. Agricultural best practices drive existing rule. Research is considering impacts to vegetative growth/decline of grasses for roadsides.
        - Aesthetics and visuals are the biggest down side of the slurry discharge. It generates the perception that something bad has happened.
    - Dewatering
        - Contractor-obtained
        - Keep AGC informed of changes/needs
    - Pesticide Application
        - Each district is a permit holder.
- Compliance Timeline: 1998 to 2013
    - Initial focus on construction
    - 2007 – MS4
    - Initially left ESC up to contractor, got minimum implementation

- One NOI posed the threat: any non-compliance would result in shutting down every DOT project.
- Either build an MS4 program or allow cities to regulate you.
    - FHU Consulting wrote the initial permit for NDOR.
    - DEQ permit writer was hired as a consultant.
- Reliance upon AASHTO TS4 for general guidance.
- Utah – gave NE copy of the 54 questions EPA asks as a self-audit.

MN – TMDL progress: when are you ever "done?"

Performance requirements for construction permits.

- Maintenance inspections as a means of closing out permits.
- Iowa – district wide ESC contracts
    - Phased ESC activities as opposed to at the end of the project.
    - Stabilizing mix also with a permanent seed component. Big Five native component, then patched later with forbs.
- Inspections – "Green Sheet Package"
    - Environmental Commitments related to the project.
    - Prior to letting
    - Generates questions in ECODatabase to ensure progress and results.
    - Signatures on Green Sheets are whomever has environmental responsibilities and requirements related to the project.
    - Cycle
        - Bi-weekly/event, district construction
        - Monthly – oversight, district environmental coordinators
            - KS – independent of district for oversight to avoid bias
            - 100-300 ac., HQ staff
            - >300 ac., consultants
        - Predetermined frequency – risk-based environmental oversight, RSU, consultants, and other environmental staff
            - NE – independent of district for audit to avoid bias
- Corrective Action
    - 7 day window for most practices
    - $500 per item, per day withholding
    - Associated with rain event inspections
    - Immediate action – 24 hours
    - Follow up is critical
    - Minimize the small corrections so they don't turn into big ones down the road.

- Inspection Reports (NE) – always be documenting something
    - Status of Green Sheet data
    - Discharge locations
    - Maintenance for BMPs
    - Failed BMPs
    - Need for additional BMPs
    - Activities on site since last inspection
    - Required corrective actions
- Report Distribution: automated through ECODatabase
    - Anyone can receive
    - Prime, ESC, Project Manager, Copy to SWPPP, Other

      If it's not documented, it never happened.
      Messy is better. Revise and date.

- Notice of Termination (NOT)
    - 180 days after 70% vegetative cover (in case other issues down the road)

Matt Sperry (ND): SWPPPs During Construction

- Agency developed a special provision for temporary ESC.
- Overcoming obstacles
    - What's to be done
    - Who does it
    - In what way
    - Who pays
- Temporary vs Permanent – for the life of the PROJECT, not the product.
- Contractor Controlled areas are required to do their own ESC. Problem is they don't do it, although covered under DOT permit. No acre limit.
    - If materials are being removed from the project site.
    - Illicit discharge is still within the DOT SWPPP.
- "Noncompliance" is any action or inaction that violates regulations. BMP failure is not necessarily non-compliance. Repair or replace, and ensure no sediment discharge.
- Project Plan Sheets are not a SWPPP (for contractors)
- Stabilization BMPs – having issues with winter maintenance (lack thereof)
- Temporary devices have to be removed. There needs to be a bid item for removal as well as installation.
- Permit terminates, ND DOT takes over.
- Inspections
    - 14 days
    - Within 24 hours of .25 inches
    - Document
    - Prolonged rainfall: 2 inspections
    - Required during normal business hours
    - Install rain gauges
    - Scheduled inspections should remain static, regardless of triggered events. Otherwise it gets confusing.
    - Copies of documents to Engineer within three working days.
- Permits: contractor obtains, DOT terminates.
- Snap a quick picture of the site prior to construction. If there is less than 10 percent coverage to begin with, it may be next to impossible to vegetate up to 70 percent, let alone more.
    - "Background Vegetation"
- Erosion Control Supervisor is an employee of prime contractor. "It's everybody's responsibility." Has to be on site. (IA, KS, CO, MN also). ND moving toward this being their only job. Currently an add-on responsibility.

- Performance Criteria: corrective action within 24 hours of notification (DOT, EPA, Health, etc.)
    - Price reduction of $500 per day, per instance
    - Another contractor to correct
    - Suspend all work
    - Withhold payment on other contract items/pay estimates
    - Applied until deficiencies have been corrected.
- 2014 is the test run. Provision is only as good as its implementation.
- "Stable is not stabilized." Snow is a temporary cover. The issue is when the snow leaves the site.
- Pay Items: temporary and permanent are together
    - Removal is separated out for temporary.
    - Bids with installation included for removal costs is an unbalanced bid.
    - No payment for replacement of ineffective BMPs
        - Improper installation
        - Lack of maintenance
        - Failure to install permanent BMP
        - Replacing BMPs due to contractor operations.
- Contractor Permit has a 7 day grace period from time of receipt of Dept. of Health application submittal.
    - Contractors may lie.
    - Gray area for contractor options.
        - Erosion control only
        - Borrow and aggregate also brings historic/cultural/hydraulic review, confuses the issue. Separate permit review would abdicate responsibility. Aggregate mining permit number clearly shows that no areas were affected – or DOT responsibility. It's a private relationship between the contractor and a land owner. A cropped field needs to be tilled in order to be "returned" to agricultural use.
        - Aggregate mining permit covers borrow pits.
        - Pits being used for multiple projects requires a mining permit anyway.
        - EPA can still say because it's for a DOT project, it's DOT responsibility.
- DOT still owns and is responsible for all activities conducted within the confines of a contractor permit. (Wal-Mart is still responsible for contractor behavior.)

Brett Troyer – MNDOT: Temporary ESC, Design & Management

- Permanent BMPs are designed in house.
- SWPPP requires design plans as part of final document, with quantities for temporary BMPs.
    - Can't have lump sum without estimated quantities.
    - Unit pay items help contractors know how to bid the project.
- Standard sheets in-house for installation and ESC practices.
    - Dewatering, concrete washout are incidental
    - Entrances are bid items, lump sum.
    - Contractor's responsibility to maintain and remove when no longer needed. Maintenance is included in the price bid. Removal is separate.
- Corps of Engineers
    - Lack of guidelines (ND)
    - Included in 404 permit, but contractor has jurisdiction over what gets installed.
    - MN is going to have a DOT liaison soon, provided by COE.
    - Jurisdictional waters are within the scope of COE regulation.
    - To be safe, be familiar with national, general permits and what COE replies in regards to what is required for the project.
- Specifications
    - General requirements & Covenants (includes stormwater management & ESC)
        - Resident engineer noted no requirement for contractors to prove compliance. "Walk through" recommended as a way to ensure.
        - Site Management Plan – contractor's accountability factor. No work can continue until the Site Management Plan is approved by the resident engineer. (ten years running)
        - All construction staff have been through the site management certification, as do contractors.
        - "Critical Areas" defined within a site – Areas of Environmental Sensitivity. Designer needs to locate within plan. Heightens awareness of what needs to be done on the site.
            - Staging Needs: can't leave until stabilized (24 hours)
            - ND Permit requirement: stabilize within 24 hours of connecting to water of the state.
            - Meeting and having requirements are two different things.
            - NE pushes "stabilize as you go." Blankets to be installed immediately upon final grading.

- NE requires a limit of 17-19 acres of open soil at any given time. ND has 2, 3 or 5 mile requirement depending on the size of the roadway.
- 14 or 21 day rule for stabilizing. ND is less stringent. 7 days in MN if within one mile of a special water body.
- "Acres withholding" $3,000.00 in acres withholding until final stabilization. Then they get their money back. Designers can bump it up to $10,000.00 if the area truly is critical.

▪ Permanent BMP design criteria is not based on storm event. It's based on slopes and grade. (MN, NE, CO, MO) KS uses 2 year for temporary and 10 year for permanent design criteria. MN is moving toward performance (bed load). IA criteria is based on shear stress.
- Shear stress used more for grouping/categorizing materials versus design criteria.

o Construction Details
▪ Erosion Control Supervisor roles and responsibilities.
▪ Incidental or lump sum payment.
▪ Project Staff/Project Engineer responsible for making sure these duties get done.

o Non-Conformance – withholding of scheduled payments. In all cases, document the date and details of conversations/correspondence, whether verbal or written. Bonding money may be used to address compliance. $500 per day, per violation may get folks in the field to comply. This method targets the business owner, and ultimate decision maker for the company.
▪ Direct Contractor
▪ Direct Contractor in writing
▪ Direct Contractor via certified mail
▪ Engineer shall inform OCIC (Chief Counsel)

o Training Partnership: PCA and U of MN
▪ Inspectors
▪ Designers
▪ Installers

In a perfect world, these folks are talking all the time. ☺

- Shared Risk Contingency: St. Croix River Crossing

    - Trying to develop practices and having contractors be responsible for what they do.
    - Contractor was on the hook for 2 year, 24 storm event. MNDOT shared risk on bigger events.
    - Set contingency at $250,000.00. If contractor was compliant and MNDOT held to large storm obligation, this amount would be returned to the contractor. Any non-compliance would come from this amount.
        - Small, intense storms and high frequency storms made "design storm" less effective.
        - Need to retune with hydrologic models that rely less upon a finite quantity/value.
        - Project staff saw this approach was unreasonable due to the erratic nature of the storm events during the project.

- Temporary Erosion Control – Lump Sum
    - Continuous payment, inspection of BMP installation regardless of contractor actions.
    - Continuous inspections of work for payment.
    - Outcomes
        - Contractor responsible for designing, implementing, modifying temporary practices
        - Tool Box Training Sessions
        - Monitor key outfalls for NTU values
        - Paying for BMPs on extreme events (3 inches, 24 hours), proactive planning required ($500.00 per incident for non-compliance)
        - Payment based on partial payment installments
        - Incentive payment at contract completion ($25,000.00/$50,000.00 for Eau Claire project)
            - Contractors pushed to be responsible for ESC learned a lot more.
            - Subcontractor was unaware of incentives, yet passed burden on to sub-contractor.
    - Innovative Contracting Methods – numerous methods available

Gabe Robertson – ECODatabase

- Kansas, Colorado also looking at similar applications.
- 3 steps
    - Setup
    - Review
    - Summary Reporting
- Also stores certified inspectors in the field. Notifies when re-certification is needed.
- Web-based HQ module, syncs with reports.
- Tablets now being used for inspections. Convenience of not having cameras, clipboards, etc.
- New Environmental Review Process (Previously Green Sheets)
    - Login, turn on questions that relate to environmental commitments.
    - Sign-off turns questions on.
    - Typically set up 3 months prior to letting.
- Consultants using inspections would have the software loaded. Otherwise, only staff.
- State projects only at this point, moving to local projects using ECOD
- Inspection tool –
    - Reports tailored to each project.
    - "Typical" inspection list
    - All immediately accessible in one location.
- Questions added are an ongoing process. It is centrally coordinated, and based heavily on Green Sheet questions, but also subject to review by those with environmental responsibilities.
- Inspections are for deficiencies only.
- "Make Draft" allows for a pdf document for secondary review before "Sign and Seal," which is ultimately final.
- Has simplified the process. DEQ does not require paper reports now.
- Network password is what gets used for ECOD.
- Used for stormwater, NEPA, T&E, 404, etc.
- 6-8 month initial development cycle
- Reports distributed via email to pre-defined groups
- Contractors do not sign off in the system. Hard copy goes to contractor.
- Inspection reminders/past due notifications
- The application allows to assess the program overall; that alone is valuable.
- The application allows to define and measure performance metrics.
    - Average days to corrective action performance
    - Project inspections

    - Percent of report submissions
    - Percent of commitments in compliance
    - Percent actions corrected within seven days
    - T&E inventories
    - FHWA Audits
- Work completion field for entry? (Serio)

Biggest lesson: make sure you have a clear vision of what it is you want the system to do, look like, operate like, etc.

Wednesday, June 11

Field Tour to NDOR Project Sites:

- Post Construction BMP demonstration (Lincoln)
- Water Crossing/Culvert Project (Wahoo)
- Environmentally Sensitive Area Site (Fremont)
- Photo catalog pending.

Thursday, June 12

Field Tour Recap:

- Maintenance Facility BMPs more demonstrational than expected as most NDOR post construction BMPs.
    - Research shows vegetated ditches will meet post construction requirements.
    - Coordination with MS4 communities will also drive practices forprojects.
    - Mitigation programs in ultra-urban areas may lead to watershed-based practices as a means of compensation.

- Bridge Project: Real-world example.
    - Not how business is traditionally done.
    - Appreciated due to what so many others also have to manage and address.
    - Example of differences between project managers and personalities that may end in different results.
    - Inability to ensure stormwater conversations occur at the project level. Supposed to happen, but no official oversight to guarantee.

- Post-Construction on Bridge driven by FWA as opposed to stormwater
    - Reactionary measures
    - Considered outside MS4 boundaries, now a three-mile buffer around MS4 communities.
    - Today, would be required regardless of FWA needs.

Carol Wienhold – Roadside Research Projects

- Topics: One good project just leads to another; funded research with UNL, manufacturers, etc.
    - Vegetation (6)
    - Runoff & Grinding Residue (4)
    - Stream Crossings (2)
    - Plant & Animal (>5)
- Vegetation Results
    - Stabilization, permanent closure, enhancement, maintenance reduction.
    - Altered seed mixes to encourage native establishment.
    - Composted yard waste and topsoil are best for vegetative growth.
    - Corral manure adds weed seeds.
    - Topsoil is best.
    - August seeding dates do not result in quality warm season grass establishment; October is better. Frequency increased over time (3 years)
    - Seeding mixes used to be consistent, statewide. Non-shouldered areas were more localized. Both seeded and non-seeded existed after 15 years.
    - Recommended species composition for sandhills, northeast and panhandle, adjusted mowing schedule.
    - Variation may have resulted in seeding dates, weather, changes to specs, etc.
    - Maintenance seeding is based on six landscape regions; construction is project-specific.
    - Fertilizer applications have been reduced in relation to native plant inclusion – cost reduction.
        - No benefit to native seeding. (Yes to cover crop)
        - Topsoil increases native grasses by 15% initially, 50% reduction in bare soil by third year.
        - Site topsoil is as good, if not better
    - Actions Taken:
        - Reduced Fescue component.
        - Reduced N, elimination of P application
        - Documented value of saving/spreading topsoil
    - New Projects
        - Wildflower longevity
            - Vary seeding rates in new projects "wildflower islands"
            - Interseeding of established sites
        - Soil properties in shoulders (compaction, moisture, salts)

        - Identify seed mixes for suboptimal soils
        - Test remedial methods for vegetation establishment
- Other Projects
    - BMPs for Highway Runoff
        - Infiltration Trenches
        - Bioretention Cells
        - Check dam filters
        - Filter Trenches
        - Rubber-chip media in soils
    - Passive Samplers for Effluent Measurement
        - How to sample on site when *not* on-site?
    - Bridge Deck Runoff
        - Evaluate conditions of runoff
        - Determine effects
    - Concrete Grinding Residue (Diamond Grinding)
        - Determine max rates of CGR to be safely applied to roadsides.
            - "Old" methods
            - Mid-range rate
            - Max allowable by existing permit
        - Factors: soil texture, cation exchange capacity, slope, area, vegetation type.
    - Stream Crossings using open bottom culverts
    - Fish Passage
    - Species Specific
        - American burying beetle
        - Swift fox
        - Western prairie fringed orchid
        - Blowout penstemon
        - Blandings turtle

- Seed Mix Requirements
    - Manage contents and process
    - Typically multiple suppliers
    - IA – compensation for lack of inspection oversight: all seed has to be mixed by a certified conditioner through Crop Improvement. Seed tag with certification statement is required.
        - No unopened bags allowed on site.
        - Third party mixer is required.
        - Driven by improper mixing and seed application on prior projects.
        - Delivered to site within 24 hours of application
    - Crop Improvement as third party validator for seed quality (yellow tag)
        - Yellow Tag requirement (IA, MN, NE – CO is unknown to date)
        - MN working to capture and emulate Iowa's process.
        - Germ test is from 9 months of installation date.
    - NE inspectors are looking for site-specific tags

Tara Carson, MNDOT – Chlorides

- Salt Management Guidance – had not been updated for some time (Maintenance)
- Not much has changed over time.
- Efficiency Measures Underway
    - Brine solutions
    - Technology for application
- Task Force (2011) – superintendents, supervisors, salt solutions

    - Assessment
        - Focus on salt shed, brine areas.
            - Can do
            - Want to do
    - Inventory
        - Design templates
        - No floor/pad specs in past
        - Retrofit issues
    - Responsible Person on Site – salt shed/equipment is under no one's watch
        - One per district
        - One per site/facility
    - BMP Toolbox
        - Focus on prevention
        - SOPs – may result in cost-benefit analysis to verify/prove/convince
            - After deliveries & off season reminders
                - Push into shed
                - Tarp facing for exposed salt
                - Always covered sand piles
                - Cleanup after calibration and or mixing
            - Prep for Events
                - Plow snow/slush away from loading areas & front of shed before loading trucks (plow there first when clearing out yard – material is less contaminated)
            - Loading
                - One area to minimize cleanup
                    - Multiple compartments – load in sequence, not any/all at once
                - Load under canopy whenever possible
                - Avoid overloading to prevent spillage

                - Post Event
                    - Make time for cleanup after event (when possible)
                    - Clean excess salt off trucks in shed – not on intersections
                    - Wash trucks in bay, not yard
            - Shed/Building & Yard design specs
                - Posi-shell for long-term granular storage
                - Salt retention areas
                - Walk behind brooms
                - Movable fronts
            - Snow Storage Plan (ponds, or not)
        - Shared Facilities
            - Not my mess vs. Not my shed
            - City/County behavior not consistent with DOT – it's DOT's permit
            - Convey expectations
            - Threat to existing relationships & partnerships

Salt is different from any other pollutant. It's a conservative element that dilutes well, does not settle out, and transports to both surface and groundwater. Any residual salts will degrade soils and other materials, leading to erosion and corrosion.

The social and cultural perception of salt, in the shops and elsewhere, is that it is not scary and it's a low priority.

- Twin Cities Metro Area Chloride Project – three year initiative
    - Chloride Standard: request to revisit in past ten years
        - Chronic: 230
        - Acute: 860
    - Sampling methods were decided independent of MNDOT
    - New 303(d) additions based on chlorides
    - Sampling protocol:
        - Early morning
        - April-October, now winter
        - Review is by sample collectors
    - Contractors & Residential
        - Voluntary certification in MN – no incentive, limited liability
        - Liability is based on risk – over-application as a result
    - Cost Factors
        - Commodity value for DOT – cannot be wasted
        - Alternatives

                - BOD impacts from residual organics
                - Sand and sweeping requirements (CO)
            - Anti-Icing (brine) and pre-wetting (tack) for efficiencies
            - Maintenance Decision Support System, ADL – atmospheric data to determine application rates
                - Mechanized
                - Also tracks actual activity (big brother perception)
                - Can be manually overridden
                - Data for future mining?
    - MNtransportationresearch.org/tag/salt
    - ND is using frack brine and flyash for road applications
        - CERCLA may not allow for such practices
    - Human health & safety on rights of way will always trump water quality.
    - Storage & Handling – using "dormant" facilities in winter months (Valleyfair amusement park/Canterbury Downs race track)
    -

David Lathrop, NDOR – Facility Runoff Control Plans & Good Housekeeping

- Operation and maintenance perspective
- Regulatory Requirements – discharge/NPDES
    - MS4
        - Includes Facility Runoff Control Plans (FRCP)
    - Industrial
        - Canned list of BMPs with some tailoring
- Stormwater Pollution Exposure/Risk
    - Construction
    - Roadway Systems
        - Runoff
        - Drainage
        - Spills/Crashes
        - Litter
    - Operations & Maintenance
        - Salt
        - Oil/fuel
- FRCP and SPCC
- Highway Spills & Crashes
    - 88% of spills
        - Fuels
        - Gluten

        - Fertilizers
    - $15,000 average cleanup costs
    - Possible IDDE if not properly contained
    - Vegetative and soils impacts require extended remediation
- Illicit Dumping
    - Animal waste
    - Concrete washout
    - Solid waste (trash)
    - Fixed pipes – permitted/not permitted/exceeding discharge
        - Parking lot runoff
    - Self-inflicted – ROW "injections"
        - Distributor oil
        - Diamond cutting
        - Tackifier
    - Unpermitted Discharges
        - Anti-ice uses 1/3 less chemical than de-icing
        - Bituminous applications prior to weather events
    - Facility Runoff Control Plan – SWPPP for the Maintenance Yard
        - Buildings & Grounds
            - Drains & Inlets
            - Tracking
            - Erosion control
            - Dry cleaning
        - Vehicles & Equipment
            - Inlet protection/washing
            - Minimize water use
            - Indoor storage
            - Oil cleanup/spills
            - Minimize drips when refueling
            - Repair way from drains
        - Product Storage
            - Fertilizers and pesticides
            - Coverage
            - Leaks
        - Bulk Tank Storage
            - Inspections
            - Residue cleanup
            - Assess conditions

            - Traffic protection
        - Waste management
            - Label all materials
            - Dispose properly Train staff
            - Protect batteries
- ECOD use for tracking, reporting and inspection data entry
    - Monthly
    - Annually
    - 3 year administrative audits
    - Documents through to resolution
- Oil & Water Separator is third line of defense
- SPCC: Spill Prevention, Control & Countermeasures
    - EPA administered
    - >1320 gallon facilities
    - Monthly inspections
    - Drainage logging
    - Biannual OWS inspections (set interval for pumping)
    - Annual review/audit
- Audit items for MS4 areas
    - Training
    - SPCC
    - Spill Response Plan
    - Records
    - Drains/maintenance
    - Floatable debris traps
    - BMP maintenance records
    - Snow removal/salt
    - Litter removal and cleanup

- In process of training and getting tools consistently used.
    - Rely on ECOD for program assessment
    - Good Housekeeping is likely most at-risk element of NDOR MS4
        - Previous inspector not necessarily assessing the right details
        - More focus on training and programmatic strategy
        - Ensuring consistent knowledge base across labor scale.
        - GIS and other tools to assess risk factors to adjacent resources, prioritize appropriate implementation

- Construction has the exposure to stormwater regulations moreso than maintenance. Similar to OSHA requirements of days past.
- Need to differentiate from other inspections that are perceived as overlap – NDOR is working to align as an entire/comprehensive environmental inspection/QC.

Amber Law, CODOT – Post Construction WQ BMPs

- Permit expired 2012, administratively extended.
- Draft permit in 2013
- Rewritten, new program
- CDPHE – Colorado Dept. of Public Health & Environment
- Issued interim program with draft permit language. No suggestions incorporated.

Draft Permit – Changes

- Local agencies: communication and coordination issues; 5-6 on any given project
- Guidance is vague, needs further clarification – who trumps whom? Liability?
- No case law exists

BMP is being changed to "control measure"

"Hydrologic & Pollution Control Practices" – never previously defined

- Now must be based on scientific fact
- Practices and standards
- Appropriate for pollutants

Increased record keeping requirements (tracking/documentation)

"Inflexible Flexibility"

- Everything is defined as "tier 1" – highest degree of treatment required
- Interpretation issues

Goals/Vision

- Clear, Consistent
- Flexible
- Streamlined
- Transparent, trackable, enforceable
- Regional approach

Treatment

- Regional BMPs
    - WQ and Transportation Projects combined

    - Look to existing processes
    - Statewide WQ mitigation fund (out of construction budget based on lane miles in MS4)
        - May become line item
- Spending is based on Max Extent Practicable
- Permanent WQ practices on specific projects
- Treat flows of own MS4, but can also treat other areas

Mitigation Fund

- $6.5 million
- Not spent on maintenance (was not factored in initially) – design/construction only
- 80% spent on three year rolling average
- Committee comprised to manage funds, select projects, initial call for projects (internal/external)

Regional Approach vs. Priority Projects

- Both eligible, priority comes first
- R not tied to mitigation
- P must address impacts from new IS, associated with highways (list of 7 pollutants)

New Impervious Area: beyond existing prior to project

Arsenic chloride, chromium, copper, manganese, zinc and tss (If stream is listed for a transportation pollutant of concern.)

TMDL requires compliance with local regulations.

20% new is a trigger point (high/low priority) – lifts burden on smaller projects.

Draft Permit Design Standards

- Added infiltration standard (70% of WqV)
- Priority requires 90% WqV or pollutant removal (one or the other or combination)

What's Next

- Hurry up and wait
- July 1, first fund payment made
- Water Quality Master Plan underway
- Writing Guidance
- Setting up tracking – separate from other projects to align with funding source (staff time included in allocation)
- Waiting for permit
- Mapping existing areas
- No big comments internally or externally on program

Funding is locked in at a fixed rate for the permit term.

- May need re-negotiation at renewal.
- Maintenance not currently included in fund. May end up a second fund.
    - Reporting concerns: temporary vs permanent

319 funds used for NE projects (maintenance, materials, etc.)

- Challenges with documentation
- Can be used for research & Education
- "Regularly Scheduled Activities" are ineligible

Post Construction BMPs need to be installed in pre-stabilized areas, otherwise the practice will fail.

Permanent can be used as temporary

- Modify outlet
- Remove existing sediment
- Avoid compaction
- …very difficult to ensure!

Post-construction program concerns

- What do you treat?
- How much do you treat?
- Where?
- When?
- What counts?
- What can be balanced in the project to allow for post-construction while in process? (basins, quadrants of interchanges, ultra-urban areas, etc.)

Trash capture is critical for primary roadways – critical

Melissa Serio, Iowa DOT – Education & Outreach

- No existing MS4 permit for Iowa DOT
- Construction site management focus
- "Qualified personnel" written in DNR permit language. No clear guidance.
    - Iowa DOT contract documents require joint inspections weekly by contractor and DOT/contracting authority
        - In theory
        - Winter maintenance DOT only
    - MN specifies qualifications
    - NE defines "qualified personnel" training requirements
- Training: Two Levels
    - Classroom (EC Technician) – certification, advanced
        - 2 day certification
        - Exam required
        - One person per company/one per RCE office (13 statewide)
    - Web-based (ESC basics) – initial level
        - 30 minute modules
        - Free
        - No pre-req
        - One person per project required to sit for training

MN – entertaining online re-certification for Design at designated times

KS – considering a district office/regional re-certification as a means of guaranteeing batch processing and reducing travel.

- Iowa DOT requires one person per project to sit for both courses.
    - When getting in trouble
    - How to keep out
    - When to call for help
    - Who to call for help
- Does not honor other state trainings at this time for basic level
- ECT does allow reciprocity for other state programs.
    - Exam is very specific to Iowa DOT requirements
- Incorporated into specs October of 2013
- Online requirements are the minimum. More can sit for training.

If we do have reciprocity between the states, should there be general training practices?

- How they are managed could differ for each state.

- Testing could be based on respective state requirements
- Proctored, have to sit for state tests for certification.

When is this going to end?

- When all sites are compliant
- "When you're doing it."
- Rules are not guidance.

Exemptions – Exam only

- Licensed engineer
- PDHs as option?

Timeline – 3 year process

- September 2009, EPA inspection
- February 2011, Inspection resolution
- March 2011, web-based training
- April 2011, AGC task force – need for training brought up
- April 2012, field guide completed
- December 2012-April 2013 – first training cycle
- October 2013 – April 2014 – training requirements in DOT specifications

Resources

- Minnesota
- California

Plans to update field manual again for upcoming training season.

ECT certification tracking within DOT certified technicians in-house system.

Early Stats – Web-based course

- ~500 people trained to date
- Increased percentage in those who complet3ed the course

In-person class

- Smaller numbers

Who attends?

- Contractors
- Subs (ESC)
- DOT Staff
- Consultants
- Local public agencies (city/county) – letting local projects through DOT, increase knowledge on DOT specs
    - Local agencies may follow DOT specs, but they now "own" the spec and are responsible for verification

Challenges

- Industry awareness of new requirements (AGC promotion)
- Reciprocity of other certification programs (other state permits, CPESC, etc.)
- Availability of instructors
- Uploading materials

Who teaches classes?

- NE, used to use Leo Holm. Now, internal staff and consultant within MS4 program. More focus now on state specific programming. 1,600 have gone through, 1,000 are current.
    - Omaha CSO is requiring DOR training.
    - LTAP charge: $85 for one-day, $200 for two-day design class
- KS, combination of Leo Holm on basics, DOT staff doing standards and specs.
- CO, entirely consultant based. 1,000 people in four months is overwhelming. Design in house was internal. Free, but likely to change.
- MN, U of MN partnership, mostly MNDOT because of the spec requirement. New permit requirements from PCA require "training." Now anyone and everyone are certifying. Used to be solely on MNDOT specs. Now it's getting confusing. ~$200 per course, ~150 for re-certification
- MO, free and internal only.

Keep true to DOT/DOR message, regardless of audience. Not tailoring course to the demands of the attendees.

Where do we go from here?

- Report to document efforts (Rebecca/Ashley's notes), sent to group for revisions
- Photos submitted to Ron
- Presentation slides to be shared at will for management and local tech transfer
- Any documents, guidance, other tools, manuals, etc. Links to documents preferred. Templates too.
- 1-2 page write-up on presentations
- Agency organizational chart

Forward Thoughts

- Reciprocity between states for training.
    - Projects operating within one watershed, different states.
    - Is there a means to make it easier, but also be effective?
        - Ensure your agency accomplishes specific goals for your state.
        - Spec module for resident engineers
        - Each state provide a syllabus to share content and scope for each class offered.
        - In-person, proctored exams that may be allowed across state lines.
        - Sharing schedules/locations/dates for regional contractors.
- National TS4 Permit – shot down by EPA due to the magnitude of all 50 states
    - Regional TS4: Region 7 as pilot
    - Model after Nebraska, respective state plans related to localized specs.
    - Here's how a DOT manages the 6 MCMs

Parting Thoughts

- "I think it was great. It got us together to share things. Many of the instincts I have on where our agency should go was reinforced. It's now about getting upper management to streamline or make things happen."
- "Format was positive. 1.5 in classroom, day in the field, then back."
- "Getting upper management support is critical to move things forward."
- "Without a strong regulator, there is a lot of autonomy. It's hard to be an internal whip."
- "Technical advisory group across sections and leadership are helpful to avoid internal conflict." NE meets quarterly with updates, requests for review, support for new developments, etc.
- "Prior to stormwater, everyone worked in their own silo. The stormwater, MS4 permit and CTAG group forced everyone to come together. It's across the board, and affects every division. It makes everyone talk."
- "Annual director's update only on stormwater." – NDOR
- "Inter-agency liaisons, if well informed and educated, can be valuable resources." WA has a "demonstrative solutions team as a means of getting buy-in across agencies. You have to have THE right person: someone who is curious and knowing/understanding of both sides, through the lens of a neutral "bridge" between the two entities.
- Consider revisiting the process next year or following year. Consider shifting the region? Adjacent states, while EPA regions differ, tend to deal with similar issues.
- Add to the agenda discussion and comment on specification writing, collecting best practices for shared use and application. Introduce new products as the industry evolves. Explanation of changes to specs for those who adopted previous versions. Shift to performance-based specs, testing standards, scale etc.
- Listserve or forum as an informal, structured outlet. Forum has the benefit of archived information. Ron will check with NDOR group. Brian will check with FHWA. MODOT has a Wiki.
- Iowa DOT has requested FHWA funds for Region 7 state peer exchange. Between this session and AASHTO meeting in DC, it may be overkill. The funds, if unused, would go back into the SPR fund. With looking at building the Iowa MS4 permit, there may be merit to bringing the four EPA states together either in the fall or another.
- Who is going to the Stormwater Practitioners Meeting? IA, CO, NE, MO, KS. ND is not attending.
- Webinar on long-term performance of BMPs releasing in October. Looks at tracking BMPs and incorporating cost estimates, etc.

- AASHTO committee participation: Gabe (NE) on guides. Matt (ND) requested, was denied.
- National Hydraulics Conference
- EPA/FHWA webinar 6/19

    - States in Region 7 EPA Peer Exchange: This event is planned for the fall of 2014, both as a follow-up from the June event and also to concentrate more specifically on program recommendations from within a common EPA regulatory region. States included in this event: Iowa, Kansas, Missouri, Nebraska.

Appendix 7: MS4 Peer Exchange

Region VII State Information Session

October 27-28, 2014
Holiday Inn – Country Club Plaza, Kansas City, Mo.

Attendees:

Name	Division
Mike Heller	Iowa DOT
Melissa Serio	Iowa DOT
Melissa Scheperle	Missouri DOT
Nate Muenks	Missouri DOT
Ron Poe	Nebraska DOR
Gabe Robertson	Nebraska DOR
Jason Van Nice	Kansas DOT
	Kansas DOT
Rebecca Kauten	University of Iowa

AGENDA

October 27	**12:00 – 5:00 p.m.**
1:00 – 1:15	Agenda "Agreement"
1:15 – 1:45	State Updates - General
1:45 – 2:15	Summary of Current Data (Kauten) - June Peer Exchange - Multi-State Survey - ALDOT Info Session (IA) - Emerging Issues & Solutions o How might these play a role in your MS4 program? o What existing activities might help address?
2:15 – 2:30	BREAK
2:30 – 3:15	Session I – Agency Structure
3:15 – 3:30	BREAK
3:30 – 4:45	Session II – Regulatory Compliance
4:45 – 5:00	Plans for Tomorrow & Close for Day
October 28	**8:00 – 11:30 a.m.**
8:00 – 8:30	Working Breakfast: Goals for the Day
8:30 – 9:45	Session III: Review Permit Language for Non-MS4 Permittees
9:45 – 10:00	BREAK
10:00 – 10:30	Weaknesses/Opportunities Assessment
10:30 – 11:15	Peer Feedback & Future Plans for Agencies
11:15 – 11:30	BREAK
11:30 – 12:30	Working Lunch: Wrap up & Next Steps for Group

Agenda "Agreement"

Session I: Agency Structure

One person negotiating a statewide transportation MS4 permit may not fully grasp the impact on other divisions.

Design: Volume versus water quality

"Design has to play a bigger role in implementation. If it's built into the plan, it is more likely to happen."

Maintenance

Session II: Regulatory Compliance

Transportation may not be the largest polluter, but there is still an impact.

"Combined" compliance – considering all environmental permits through a comprehensive approach. (Wetlands, NEPA, etc.)

What's the obligation to established MS4 communities?

"By regulation, you are responsible for being a part of municipal stormwater programs. In that sense, DOT is regulated by MS4 requirements. They may not be enforced today, but it could be. If EPA were to review a city's program where DOT projects exist, your DOT could be brought into the process."

"No amount of money or personnel would allow us to comply as a co-permittee."

"If you have ROW within the jurisdictional boundaries, that city is likely to bring DOT in if they have regulatory issues with their own MS4. "

Session III: Permit Language

Siting post-construction practices – what can a transportation agency do?

"Maximum Extent Practicable"

Enforcement challenges: What to do when you can't write a ticket

Alternatives to Ordinances

Session IV: Weakness/Opportunities Assessment

Existing practices that may by assessed for water quality benefit: street sweeping, facilities maintenance, etc.

I. Agency Structure & Integration: Programmatic & Systematic Concepts
    a. Internal
    b. External

c. Inter-agency

II. Regulatory Compliance/Document Retention & Management
    a. How would you characterize you relationship with your regulator?
    b. What factors play a role in this relationship?
    c. What steps are you taking to organize and inventory relevant MS4 Program documentation?

III. Review specific sections for "Non-MS4language."
    a. Language Worksheet (provided)
    b. How might these be re-worded or reconfigured to address non-MS4 program goals and capabilities?