SWPPP Design Elements & Class Review

2011 North Dakota Storm Water & Pollution Control Conference
April 5, 2011
Gladstone Inn & Suites, Jamestown ND
Dwayne Stenlund, MSc., CPESC
Resource Professionals Alliance

NORTH DAKOTA WATER AND POLLUTION CONTROL CONFERENCE
NDWPCC

SWPPP customized and commensurate to the proposed construction activity

- No two SWPPPs are alike
  - Demolitions
  - Noise walls
  - Signalization, communications, small utilities
  - Cable barrier
  - Gas & electric utilities
  - Trails
  - Roads
  - Bridges
  - Airport Runways
  - Waterways
  - Living snow fences, landscaping
  - Historic areas (walls, rest areas)

SWPPP Types

- Wild land
- Rural
- Urban
- Ultra-urban
- Military

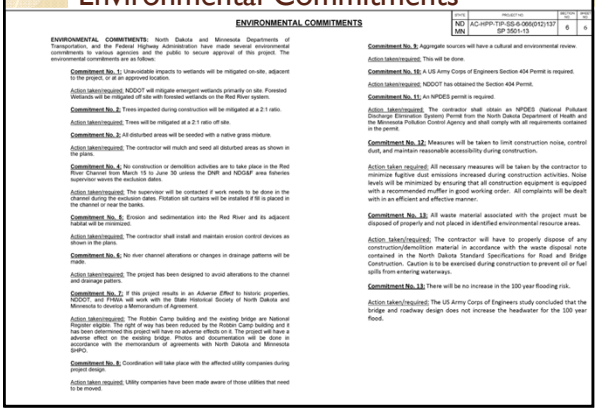
Linear SWPPP Design Program

- Deliver environmental commitments
- Deliver buildable/biddable pollutant prevention plans
- Deliver best value, using common sense and best available engineering standards to the maximum extent practicable

4 Main Construction Impairments

- Phosphorus
  - Nutrient eutrophication biological indicator
  - *Carrier on sediment, dusts, fertilizer, chemicals, engine exhaust, decaying organic matter*
- Dissolved Oxygen
  - *Organic matter, oils, solvents, poor mixing of waters, dams, low channel flows, impervious area increase, high water temperature*
- Turbidity
  - *Dusts, soils, particulate matter, loss of soil covers*
- Aquatic Biota
  - Fish bioassessment
  - Aquatic plant bioassessment
  - Aquatic macroinvertibrate (worms, leeches, snails, caddisflies, etc.) bioassessment
  - *Salts, sediments, siltation, pH, urbanization, temperature, loss of habitat, loss of water recharge, surface water flow reduction, stream flashiness*

Environmental Commitments



ENVIRONMENTAL COMMITMENTS

STATE	PROJECT NO.	SHEETS	SHEET NO.
ND MN	AC-HPP-TIP-SS-9-066(042)137 SP 3501-13	6	6

ENVIRONMENTAL COMMITMENTS: North Dakota and Minnesota Departments of Transportation, and the Federal Highway Administration have made several environmental commitments to various agencies and the public to secure approval of this project. The environmental commitments are as follows:

Commitment No. 1: Unavoidable impacts to wetlands will be mitigated on-site, adjacent to the project, or at an approved location.

Action taken/required: NDDOT will mitigate emergent wetlands primarily on site. Forested Wetlands will be mitigated off site with forested wetlands on the Red River system.

Commitment No. 2: Trees impacted during construction will be mitigated at a 2:1 ratio.

Action taken/required: Trees will be mitigated at a 2:1 ratio off site.

Commitment No. 3: All disturbed areas will be seeded with a native grass mixture.

Action taken/required: The contractor will mulch and seed all disturbed areas as shown in the plans.

Commitment No. 4: No construction or demolition activities are to take place in the Red River Channel from March 15 to June 30 unless the DNR and NDGAF area fisheries supervisor waives the exclusion dates.

Action taken/required: The supervisor will be contacted if work needs to be done in the channel during the exclusion dates. Flotation silt curtains will be installed if fill is placed in the channel or near the banks.

Commitment No. 5: Erosion and sedimentation into the Red River and its adjacent habitat will be minimized.

Action taken/required: The contractor shall install and maintain erosion control devices as shown in the plans.

Commitment No. 6: No river channel alterations or changes in drainage patterns will be made.

Action taken/required: The project has been designed to avoid alterations to the channel and drainage pattern.

Commitment No. 7: If this project results in an *Adverse Effect* to historic properties, NDDOT, and FHWA will work with the State Historical Society of North Dakota and Minnesota to develop a Memorandum of Agreement.

Action taken/required: The Robbin Camp building and the existing bridge are National Register eligible. The right of way has been reduced by the Robbin Camp building and it has been determined this project will have no adverse effects on it. The project will have a adverse effect on the existing bridge. Photos and documentation will be done in accordance with the memorandum of agreements with North Dakota and Minnesota SHPO.

Commitment No. 8: Coordination will take place with the affected utility companies during project design.

Action taken required: Utility companies have been made aware of those utilities that need to be moved.

Commitment No. 9: Aggregate sources will have a cultural and environmental review.

Action taken/required: This will be done.

Commitment No. 10: A US Army Corps of Engineers Section 404 Permit is required.

Action taken/required: NDDOT has obtained the Section 404 Permit.

Commitment No. 11: An NPDES permit is required.

Action taken/required: The contractor shall obtain an NPDES (National Pollutant Discharge Elimination System) Permit from the North Dakota Department of Health and the Minnesota Pollution Control Agency and shall comply with all requirements contained in the permit.

Commitment No. 12: Measures will be taken to limit construction noise, control dust, and maintain reasonable accessibility during construction.

Action taken required: All necessary measures will be taken by the contractor to minimize fugitive dust emissions increased during construction activities. Noise levels will be minimized by ensuring that all construction equipment is equipped with a recommended muffler in good working order. All complaints will be dealt with in an efficient and effective manner.

Commitment No. 13: All waste material associated with the project must be disposed of properly and not placed in identified environmental resource areas.

Action taken/required: The contractor will have to properly dispose of any construction/demolition material in accordance with the waste disposal note contained in the North Dakota Standard Specifications for Road and Bridge Construction. Caution is to be exercised during construction to prevent oil or fuel spills from entering waterways.

Commitment No. 13: There will be no increase in the 100 year flooding risk.

Action taken/required: The US Army Corps of Engineers study concluded that the bridge and roadway design does not increase the headwater for the 100 year flood.

Avoid, Minimize, Mitigate Plan

Wetland Impact Table

Location	LAT/LONG	Wetland Number	Wetland Type (Cowardin Classification including water regime)	Permanent Impacts to Wetlands Protected under E.O. 11990	Impacts to USACE Jurisdictional Wetlands	
					Temporary	Permaneat
Sec. 25, 26, T159N, R51W Pembina Co. ND	48.571182 / -97.171828	1	PEMA	0.92	0.92	0.92
Sec. 25, T159N, R51W Pembina Co. ND	48.572142 / -97.156824	2	PEMAd	0.36	3.50	0.36
Sec. 15 & 25, T159N, R51W Pembina Co. ND	48-571508 / -97.151609	3A	PEMA	0.06	3.53	0.06
Sec. 15 & 25, T159N, R51W Pembina Co. ND	48-571508 / -97.151609	3B*	PFO/EMA	1.10	0.71	1.10
Sec. 15, 25, T159N, R51W Kittson Co. MN	48.571575 / -97.148241	Red River	R2UBH	0.06	0.35	0.06
Sec. 15, 25, T159N, R51W Kittson Co. MN	48.571996 / -97.146386	4**	PFO/EMA	0.92	0.94	0.92
Sec. 29, T159N, R50W Kittson Co. MN	48.572696 / -97.144056	5	PEMA	0.07	0.14	0.07
Sec. 20, T159N, R50W Kittson Co. MN	48.572978 / -97.141775	6	PEMA	0.02	0.16	0.02
Sec. 15, T159N, R51W Pembina Co. ND	48.572821 / -97.155258	7	PEMA	0.30	0.00	0.30
Total Impacts				3.81	10.25	3.81

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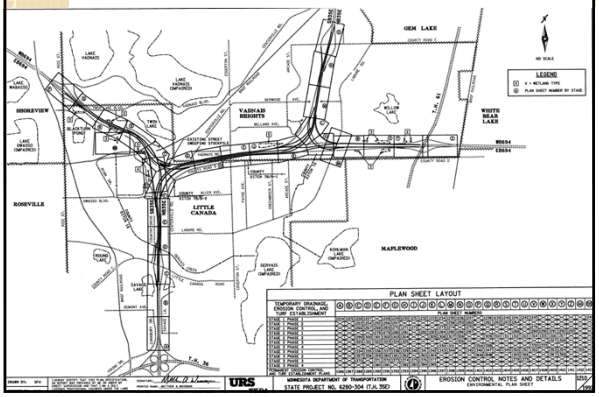
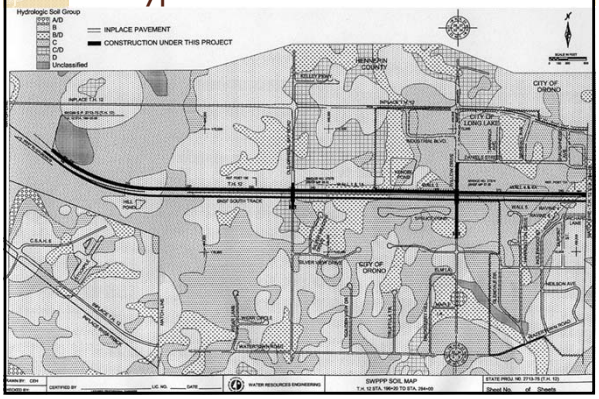
Identifies Surface Water Bodies Adjacent to Project

Environmental Plan Sheet

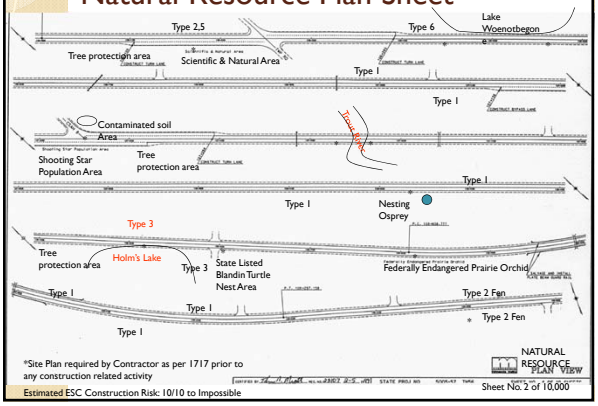


Threatened & Endangered Species

Soil Types



Natural Resource Plan Sheet



http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm

Highway Project Design Process (HPDP) Subject Guidance

Accessibility Requirements
Air Quality
Airports & Aviation
Bikeways & Pedestrians
Construction Impacts
Consultant Agreements
Contaminated Properties
Cost Effectiveness Policy
Cost Participation
Critical Areas
Design Standards and Exceptions
Energy Analysis Procedure
Environmental Justice
Erosion Control
Excess Materials (Disposal of)
Farmland Impacts
Fish and Wildlife
Flood Plains
Geometric Layouts
Groundwater, Geotechnical & Earthborn Vibrations
Historical, Archaeological & Cultural Impacts
Interstate Access Requests
Land Use Impacts
Municipal Consent
Noise
Railroad
Regulated Material/Waste
Right-of-Way
Section 4(f), Section 6(f)
Snow Blowing & Drifting Snow Control
Social & Economic Impacts
Soils, Materials, Foundations & Pavement
Streams or Water Body Modification
Threatened & Endangered Species, Federal
Threatened & Endangered Species, State
Traffic Forecasts
Transit
Vegetation
Visual Quality

Environmental Assessment Worksheet

Note to reviewers: The Environmental Assessment Worksheet (EAW) provides information about a project that may have the potential for significant environmental effects. This EAW was prepared by the Minnesota Pollution Control Agency (MPCA), acting as the Responsible Governmental Unit (RGU), to determine whether an Environmental Impact Statement (EIS) should be prepared. The project proposer supplied reasonably accessible data for, but did not complete the final worksheet. Comments on the EAW must be submitted to the MPCA during the 30-day comment period which begins with notice of the availability of the EAW in the *Minnesota Environmental Quality Board (EQB) Monitor*. Comments on the EAW should address the accuracy and completeness of information, potential impacts that are reasonably expected to occur that warrant further investigation, and the need for an EIS. A copy of the EAW may be obtained from the MPCA by calling (651) 296-7395. An electronic version of the completed EAW is available at the MPCA Web site http://www.pca.state.mn.us/news/eaw/index.html#open-eaw.

1. **Project Title:** Monticello Southeast Interceptor/Bondhus Segment Trunk Sewer Extension

2. **Proposer:** City of Monticello
   Contact Person Jeff O'Neill
   and Title Deputy Administrator
   Address 505 Walnut Street – Suite 1
   Monticello, Minnesota 55362
   Phone (763) 295-2711
   Fax (763) 295-4404

3. **RGU:** Minnesota Pollution Control Agency
   Contact Person Barbara Jean Conti
   and Title Project Manager
   Address 520 Lafayette Road North
   St. Paul, Minnesota 55155
   Phone (651) 296-6703
   Fax (651) 296-7782

4. **Reason for EAW Preparation:**
   EIS Scoping ___ Mandatory EAW _X_ Citizen Petition ___ RGU Discretion ___ Proposer Volunteered
   If EAW or EIS is mandatory give EQB rule category subpart number and name: 4410.4300 subp.18.A – Wastewater Systems

5. **Project Location:** County Wright City/Twp Monticello
   NW 1/4 ___ 1/4 Section 13 Township 121N Range 25W
   SW 1/4 ___ 1/4 Section 12 Township 121N Range 25W

Attachments to the EAW:
Figure 1. County map showing the general location of the project;
Figure 2. United States Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries;
Figure 3. Map showing proposed alignment;
Figure 4. Aerial photo of potential future service area;
Figure 5. Minnesota Department of Natural Resources (DNR) Natural Heritage Database Review letter;
Figure 6. State Historical Preservation Office (SHPO) report; and
Figure 7. Soils Map.

EPA SWPPP

- Total Pollutant Management

Developing Your Stormwater Pollution Prevention Plan

A Guide for Construction Sites

Who?
Construction site operators (generally, the person who has operational control over construction plans and/or the person who has day-to-day supervision and control of activities occurring at the construction site)

Where?
Construction sites required to comply with stormwater discharge requirements

What?
A guide to help you develop a good Stormwater Pollution Prevention Plan (SWPPP)

Why?
Stormwater runoff from construction sites can cause significant harm to our rivers, lakes, and coastal waters

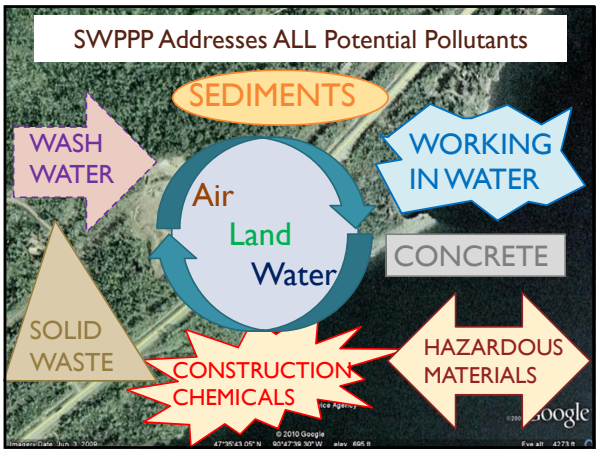
A SWPPP is required (by your construction general permit) and will help you prevent stormwater pollution

A SWPPP is more than just a sediment and erosion control plan.
It describes all the construction site operator's activities to prevent stormwater contamination, control sedimentation and erosion, and comply with the requirements of the Clean Water Act

How? It's the law that directs the contractor to implement

Construction Site Pollutants

Areas of Consideration	Primary Pollutant: Sediment	Other Pollutants: Nutrients	Heavy metals	pH (acids & bases)	Toxic organics (pesticides, oil & grease)	Bacteria & Viruses	Trash, debris, solids	Other (salt, chloride)
Clearing, grading, excavating, and unstabilized areas	✓						✓	
Paving operations	✓						✓	
Concrete washout and waste			✓	✓			✓	
Structure construction/ painting/cleaning		✓		✓			✓	✓
Demolition and debris disposal	✓						✓	
Dewatering operations	✓	✓						
Drilling and blasting operations	✓			✓			✓	
Material delivery and storage	✓	✓	✓	✓	✓	✓	✓	✓
Material use during building process		✓	✓	✓	✓	✓	✓	✓
Solid waste (trash and debris)							✓	✓
Hazardous waste			✓	✓	✓	✓		✓
Contaminated spills		✓	✓	✓	✓	✓		✓
Sanitary/septic waste		✓		✓			✓	✓
Vehicle/equipment fueling and maintenance					✓			✓
Vehicle/equipment use and storage						✓		✓
Landscaping operations	✓	✓						✓



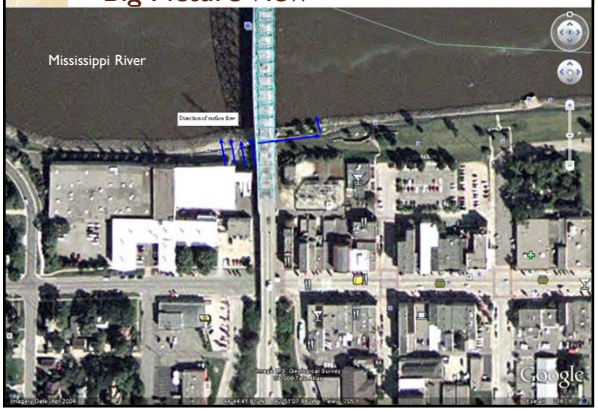
SWPPP Design Procedure

- Analyze project in relation to receiving waters
- Analyze project in relation to the receiving environment
- Design for all known and potential discovered pollutants generated to complete the project
- Generate best management practices for all stages and phases of construction for scoped time of year
- Determine how to pay for pollution management
- Design as if you had to build it under the low bid, design build, or process to be determined
- Design as if someone has to maintain what ever is built

Design for all permit requirements

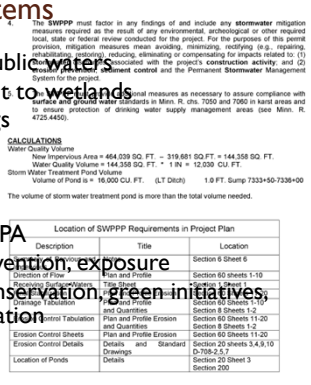
- USACE
- Regulated wastes
- Department of Health
- Dewatering/Water Appropriations
- Cites
  - MS4
- Counties

Big Picture View



Specialty SWPPP Items

- Working over public waters
- Working adjacent to wetlands
- Soft soil crossings
- Staging areas
- Special waters
- Impaired waters
- HPDP/NEPA/MEPA
- Safety: flood prevention, exposure
- Sustainability, conservation, green initiatives, carbon sequestration



The **SWPPP** must factor in any findings of and include any **stormwater** mitigation measures required as the result of any environmental, archeological or other required local, state or federal review conducted for the project. For the purposes of this permit provision, mitigation measures mean avoiding, minimizing, rectifying (e.g., repairing, rehabilitating, restoring), reducing, eliminating or compensating for impacts related to: (1) **construction activity** associated with the project's **construction activity**; and (2) **Erosion prevention**, **sediment control** and the Permanent **Stormwater** Management System for the project.

The **SWPPP** must include additional measures as necessary to assure compliance with surface and ground water standards in Minn. R. chs. 7050 and 7060 in karst areas and to ensure protection of drinking water supply management areas (see Minn. R. 4725.4450).

CALCULATIONS

Water Quality Volume
New Impervious Area = 464,039 SQ. FT. – 319,681 SQ.FT. = 144,358 SQ. FT.
Water Quality Volume = 144,358 SQ. FT. * 1 IN = 12,030 CU. FT.

Storm Water Treatment Pond Volume
Volume of Pond is = 16,000 CU. FT. (LT Ditch) 1.0 FT. Sump 7333+50-7336+00

The volume of storm water treatment pond is more than the total volume needed.

Location of SWPPP Requirements in Project Plan

Description	Title	Location
		Section 6 Sheet 6
Direction of Flow	Plan and Profile	Section 60 sheets 1-10
Receiving Surface Waters	Title Sheet	Section 1 Sheet 1
Drainage Tabulation	Plan and Profile and Quantities	Section 60 Sheets 1-10 Section 8 Sheets 1-2
Erosion Control Tabulation	Plan and Profile Erosion and Quantities	Section 60 Sheets 11-20 Section 8 Sheets 1-2
Erosion Control Sheets	Plan and Profile Erosion	Section 60 Sheets 11-20
Erosion Control Details	Details and Standard Drawings	Section 20 sheets 3,4,9,10 D-708-2,5,7
Location of Ponds	Details	Section 20 Sheet 3 Section 200

Owner SWPPP	Construction/contract SWPPP
• Human, environment Impact determinations • Soils information • Layout decisions, basis for decision • Ultimate calculations for final storm water quality • Relationship to MS4 Permit • Who will maintain final SWQ facility	• What gets implemented during the construction phase ◦ Plan BMP location ▪ Structural ▪ Non-structural ◦ Details ◦ Narrative

2 SWPPP's

Memorandum of Agreement
between
North Dakota Department of Transportation (NDDOT)
and
North Dakota Department of Health (NDDH)

I. Preface

The NDDOT and NDDH share a common interest in providing for the health, safety and welfare of the residents of the state of North Dakota. Both agencies recognize that it is in the best interest of the state that highway projects be designed, constructed and operated according to standards that will minimize erosion and sediment damage to the highway and adjacent properties as well as preventing pollution of surface and groundwater resources. This agreement is entered into by each agency to promote interagency cooperation and to define the duties of each agency as they relate to the efficient implementation of erosion and sediment control on highway construction projects in North Dakota.

d. Erosion and sediment control provisions will continue to be incorporated into the design plans for projects. The plans should take into account the complexity of the project, erosion potential and potential for off site impacts. The NDDOT's current design criteria (specification / guidelines) relating to erosion control meet the intent of the NDDH storm water program, as of the signed date of this agreement. The NDDH and NDDOT will interchange information on sediment and erosion control techniques or standards to assure designs continue to contain sound engineering principals and up to date methods.

VII. Acceptance of Agreement

The parties of this agreement are aware of all conditions herein and do hereby agree to maintain their responsibilities under this agreement.

For the NDDOT:

David A. Sprynczynatyk, P.E.
Director, NDDOT
Date: 4-21-06

For the NDDH:

Terry Dwelle, M.D., M.P.H.T.M.
State Health Officer
Date: 4/4/06

Arvy Smith
Deputy State Health Officer

APPROVED AS TO SUBSTANCE BY:

Mark S. Gaydos P.E.
Design Engineer, Design Division
Date: 4/20/06

APPROVED AS TO SUBSTANCE BY:

L. David Glatt, P.E.
Chief, Environmental Health Section
Date: 3/13/06

APPROVED as to execution this 21st day of April 2006
ATTORNEY GENERAL
By: Dave Kaufmann
SPECIAL ASST. ATTORNEY GENERAL

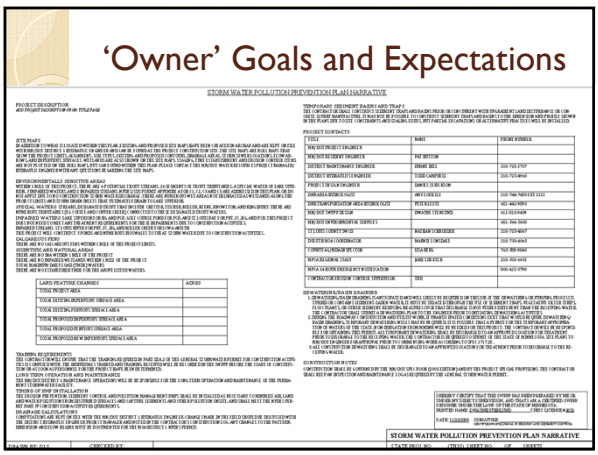
SWPPP Details (examples)

- **Dewatering methods**
- Exit trackout control
- Blanket/TRM/sod/geotextile installation
- Riprap installation
- Inlet staging
- Culvert staging
- **Filter checks**
- Perimeter controls
- Chemical/trash/hazard management
- Noxious weed, animal, bug control
- Natural preservation method
- Working water bypass
- **Sediment capture traps, flocculent systems**

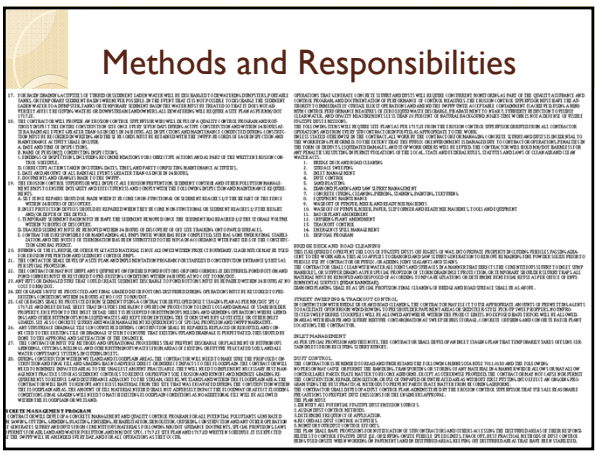
SWPPP Narratives

- All season protection
- Pond order
- Expectations
- Sequencing, phasing
- Knowledge and Experience, Contacts
- Deductions for failure to perform
- Cross linked for all construction operations
- Additional permit conditions: Borrow pits, haul roads
- Good housekeeping
- Specialty operations: Batch plants
- Inspections, management process
- **Effluent monitoring process/procedure**

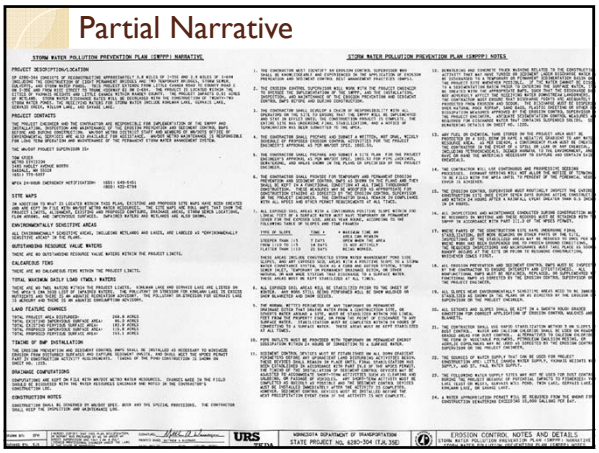
'Owner' Goals and Expectations


STORM WATER POLLUTION PREVENTION PLAN NARRATIVE

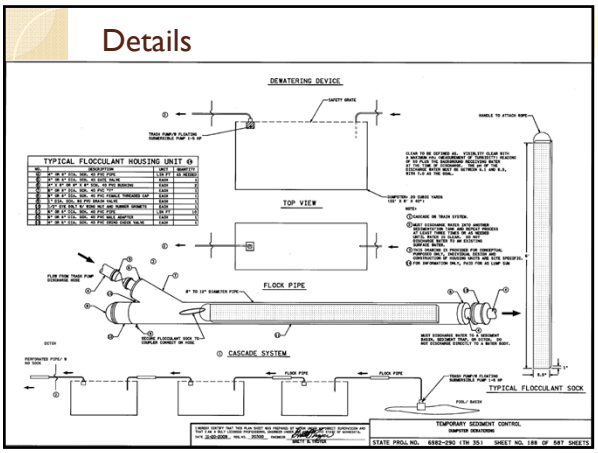
Methods and Responsibilities



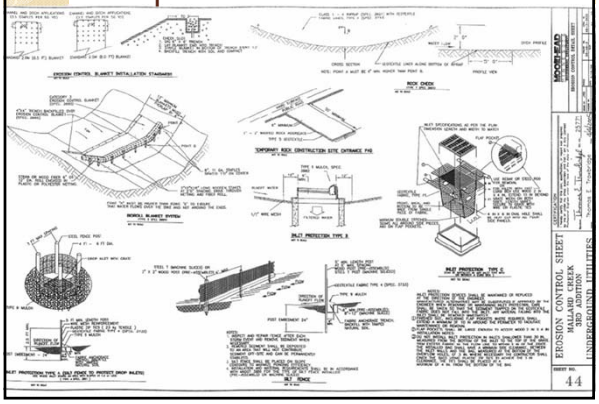
Partial Narrative



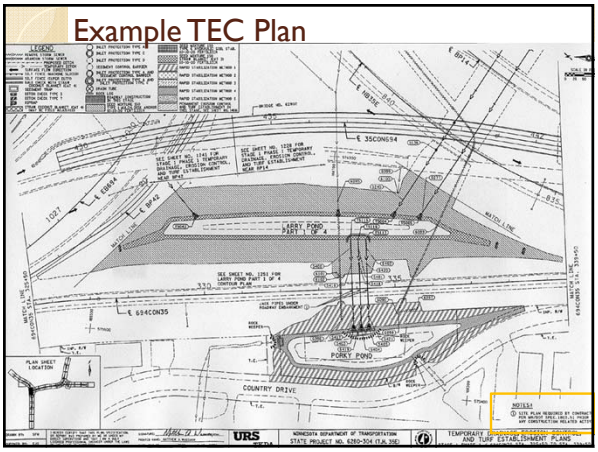
Details



Example BMP Details



Example TEC Plan



Storm Water Pollutant Prevention Plan EVALUATION Criteria

Criteria	What to look for
Defines responsibility for Implementing the SWPPP (IMP)	*Who does what, when, consequences for failure to perform, training*
Location of Plan components (LOC)	*Table of contents, schedule of operations, pond construction sequence, timing*
Temporary Erosion Control Plan (TEC)	*Quantities, locations, methods, materials*
Temporary Sediment Control Plan (TSC)	*Details, quantities, locations, methods, materials*
Permanent Erosion Control Plan (PEC)	*Seed mixtures, mulches, pay items, plan location, basis of decision*
Permanent Sediment Control Plan (PSC)	*Traps, ponds, filters, bioswales, swirl chambers, basis of decision, etc.*
Good Housekeeping (GHK)	*Spill response, total chemical management, trash, dusts, track-out*
How will the contractor be paid for work (SEQ)	*Estimated quantities, lump sum, incidental, unit*
Monitoring/Maintenance/Documentation (DOC)	*Example report, frequency, location, who, when, response*
Amendments to SWPPP Process (AMD)	*Method, criteria, schedule*
Post construction WQ maintenance plan (WQP)	*Who, location of plan, availability*

ESO Worksheet Review

Expedited Settlement Offer Worksheet
Findings and Alleged Violations
Consult instructions regarding eligibility criteria and procedures prior to use

1	Legal Name and Mailing Address of Operator	Telephone Number	NPDES Permit Number
2	Location and Address of Site		

Name of Site Contact (ESO Worksheet recipient):
Name of Authorized Official (40 CFR 122.22):
Inspection Date:
Start Construction Date:
Estimated Completion Construction Date:
If Unpermitted, Number of Months Unpermitted:
Name of Receiving Water Body (indicate whether 303(d) listed):
Acres Disturbed (whole common plan):
Is Site Eligible for Rainfall Erosivity or TMDL Waiver per 44 CFR 122.26(b)(15)?

Citation Reference	No. of Violations	Violation Amount	Settlement Offer

Class Plan Reviews

1.	TH35	Duluth	Ultra-urban MegaProject
2.	TH35E	Little Canada	Urban Unweave
3.	TH36	Stillwater	Shoddy Mill Historic Bldg Relocation
4.	CSAH72	Maplewood	Century Ave/Valley Creek Rd.
5.	HHIC	Moorhead	Hjemkomst Flood Wall
6.	DNR	Lake Shetek	State Park Campground Rehabilitation
7.	City	North Mankato	Parks Edge Addition
8.	TH61	North Shore	Split Rock
9.	CSAH30	Maple Grove	Box Culvert
10.	IH94	Black River Falls	Tomah Rd.
11.	USH12	Lake Delton	Sauk City Rd.
12.	TH61	Hastings	Bldg Removal/demolition
13.	TH60	Faribault	Historic Bridge
14.	CSAH20	Crow Wing Co.	Riverside Drive