

## **PROJECT OVERVIEW AND GOALS**

The overall goal of this research is to improve methods to reduce total suspended sediment from construction storm water runoff. Specific goals include:

- Developing an on-site, tailgate test tool-kit of commonly available flocculants for use with storm water from construction sites.
- Developing sample bottle procedures for appropriate floc chemical selection.
- Verifying the most effective dosage at the least cost per unit of chemical treatment.
- Based on the field test, developing and scaling dosing and ramping calculations that can be determined and applied to dewatering operations and slope erodibility reductions.
- Implementing a method for soil floc residual testing and detection of unreacted product in the hose or culvert outflow discharge, and commensurate reduction of chemical dose as work progresses.
- Providing guidance to prevent overdosing and spillage and what actions to take if spillage occurs.

## **PROJECT TASKS**

Under this contract, Contractor will complete the following tasks:

### **Task 1: Project Management, Administration, and Meetings**

Under this task, Contractor will:

1. Manage the project to ensure that work meets the objectives, schedule, and budget. This includes discussions with State and project staff.
2. Attend specific meetings, as presented in Tasks 2, 4, and 6.

*Task Deliverable:* Meeting Notes, including: a listing of flocculants considered and those chosen for testing, and selection criteria used

### **Task 2: Review Previous Research**

Under this task, Contractor will:

1. Review the 2014 Druschel report "Flocculation Treatment BMPs for Construction Water Discharges."
2. Check applicable literature cited in the Druschel report.
3. Perform a brief web search to determine if other sources exist and research information focused on current project, such as manufacturers' information on dosing for various uses, and mixing requirements. This process will include input from State and the Technical Advisory Panel (TAP) regarding work by other Departments of Transportation (DOTs), including North Carolina, Washington, Oregon, New York, etc.
4. Meet with the TAP to discuss project plans and flocculants to be used (including the Minnesota Pollution Control Agency [MPCA]).

*Task Deliverables:* A Technical Memo, providing information pertaining to current project, including:

- Select flocculants to use for current study (5-8 expected, including a clay base [Standard Contracting Flocc], a chitosan [BioStar CH], and up to three polyacrylamides [Aqua Hawk 6447, Tramfloc {assuming a product that can be simply used}, and possibly other to be determined])
- Dosage guides for various soil types (~3 to be tested)
- Best mixing procedures.
- Best Management Practices (BMPs) (ex. proper dosing, measurement methods for Total Suspended Solids [TSS], how to deliver flocculent to storm water).

### **Task 3: Assemble Tailgate Test Kit**

Under this task, Contractor will:

1. Obtain reference soil samples for trial tests.
2. Obtain flocculent samples with Material Safety Data Sheet (MSDS) and cost information.
3. Purchase test supplies.
4. Prepare a test kit, keeping construction site conditions in mind (use plastic, durable materials), including:
  - Containers for flocculants
  - Mixing tool(s)
  - Turbidity meter (assume one can be rented or borrowed)

- pH meter (assume one can be rented or borrowed)
- Thermometer
- Method to adjust pH as necessary (plastic burette, etc)
- Volume measurement device(s)
- Dosage guide
- MSDS information
- Field guide for test kit use (from Task 3)
- Residual flocculent test material (selected sediment to use for determining if excess flocculent exists in discharge water)

**Task Deliverable:** Tailgate Test Kit Description (list and describe items in test kit so that it can be purchased and put together be others)

#### **Task 4: Field Testing**

Under this task, Contractor will:

1. Develop dosage test methods.
2. Develop field guide for test kit use.
3. Demonstrate batch flocculation on actual construction site.
4. Develop test methods for measuring floc residual in discharged clean water.
5. Review BMPs (see above).
6. Collect photos and video to be used for training (see below).
7. Mid-project TAP conference call meeting to provide progress report.

**Task Deliverable:** Field Notes Memorandum; Photos and Video; Test Protocol for Measuring Floc Residual; Field Guide for Test Kit Use

#### **Task 5: Follow-up**

Under this task, Contractor will:

1. Determine method(s) to scale test kit results.
2. Determine method to test new flocculants.

**Task Deliverable:** Draft write up to be included in final report.

#### **Task 6: Prepare Draft Final Report**

Under this task, Contractor will:

1. Prepare draft report.
2. Develop curriculum for technical training (include photos and video from Task 4).
3. Meeting with TAP to present results.
4. Revise report according to TAP comments.

**Task Deliverable:** Short summary report with appendices (Interim report(s), field notes, test procedure)

#### **Task 7: Prepare Final Report**

Under this task, Contractor will:

1. Edit draft report based on editorial review.
2. Prepare for publication.

**Task Deliverable:** Final report for publication

### **PROJECT PERSONNEL**

Joel Toso will serve as Contractor's lead on this project. He will be assisted by Contractor's staff engineers and scientists, along with subcontractor Dr. Rebecca Forman.

**PROJECT SCHEDULE**

Task	2016											2017		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	X													
3	X	X												
4			X	X	X	X	X	X	X					
5									X	X				
6											X	X		
7													X	X

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Note that, the project schedule exceeds the expiration date of the contract, and the expiration date of the current Transportation Research Assistance Program (TRAP) certified list program for which this contract is being awarded under. This contract will not be allowed to exceed beyond that date, August 31, 2016, unless Contractor is approved under the forthcoming 2016 TRAP certified list, in which case, this contract will be amended to be completed under that new program. Should Contractor not apply for, or be approved under, the 2016 TRAP certified list, work on this contract will cease upon the August 31, 2016 expiration date.

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