

**SEGMENT 1**

**UPDATE ON PHASE 1 WORK**

**DECEMBER 3, 2012**

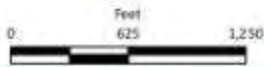


**LEGEND**

— Sediment Management Areas



1 in = 600 feet



**SMA Overview**  
Tittabawassee River

Figure  
**1**

# Segment 1 - Selected Remedies

- SMA 1 – Cap
- SMA 2 & 3 – (DNAPL) removal and treatment, Install physical containment (Cap, sheet pile), hydraulic removal and treatment
- SMA 4 & 5 – Cap
- SMA 6 – (DNAPL) removal and treatment, Install physical containment (Cap, sheet pile), hydraulic removal and treatment

# Segment 1 Sequence/Phasing

## **2012**

- DNAPL Evaluation and Recovery – SMA 2,3 &6
- Cap – SMA 4&5
- 2013 Design

# 2012 Segment 1 Activities

SMA 2 DNAPL Removal

SMA 3 DNAPL Removal

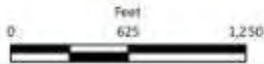
SMA 6 DNAPL Removal

SMA 4&5 Capping

LEGEND  
— Sediment Management Areas



1 in = 600 feet



SMA Overview  
Tittabawassee River

Figure 1

# Segment 1 Sequence/Phasing

## 2013

- Continue DNAPL Recovery – SMA 2,3 &6
- Sheet Pile and Cap – SMA 2,3 &6
- Hydraulic Removal – SMA 2,3 &6
- Cap – SMA 1

# **DNAPL RECOVERY**

# Segment 1 - 2012 DNAPL Recovery

## **Product Recovery Evaluation – SMA 2,3 &6**

- Install a series of 2” vertical wells
- Develop wells and monitor for DNAPL
- Identify wells for DNAPL recovery
- Install step-out wells, as needed

## **Product Recovery – SMA 2,3 &6**

- Perform routine pumping of recovery wells
- Monitor and adapt pumping frequency to optimize DNAPL recovery
- DNAPL containerized and incinerated at Dow facility



# River Access System



# River Access System & Sonic Rig



# Sonic Rig



06.19.2012

# SMA- 6 Recovery Wells



# SMA- 6 DNAPL Recovery



06.25.2012

# Sink and Collection System



# Oil Water Separator



06.21.2012

# DNAPL Removal Summary

- Began installing wells in June
- Shutdown and demobilized 11/29/12
- Installed approximately 240 wells
- Successful in finding and removing DNAPL in all 3 SMAs



# **SMA 4 AND 5 CAPS**



1 in = 70 feet



**SMA4 and SMA 5 Cap**  
Tittabawassee River

Figure  
1

# SMA 4 CAP

# SMA 4 Cap Area



























# SMA 5 CAP



# SMA 5



# Crane mats





# Bank access





# Overview





# Filling bucket





# Load of stone entering water



# Armor Stone Installation



# SMA 4 & 5 Monitoring

- Short term monitoring of SMA 4 indicated Geocell cap is successfully filling in.
- Long term monitoring of both caps will be conducted