ARCADIS Design & Consultancy for natural and built assets

Mayflower Pipeline Incident Response

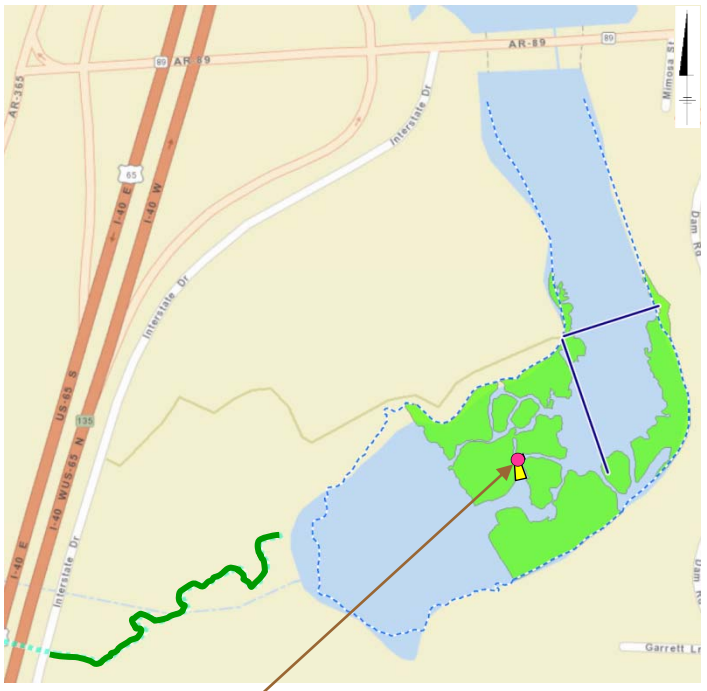
Mayflower, Arkansas

Post-Construction Sheen Monitoring Monthly Report #9: December 2015

Period: 12/01/2015 through 12/31/2015

Monitoring Days: 12/12/2015 and 12/22/2015

Legend:
Green Line – No Sheen
Pink Circle – Non-Brittle Sheen Location
– September 2015 Additional Organoclay Placement



Cove (Summary of Observations from December 2015)

Observations in Inlet Channel:

- No sheen observed in the Inlet Channel.

Observations in Cove:

- No sheen observed in Open Water Area and downstream of Heavily Vegetated Area.
- December 22, 2015: Patches/streamers of silver gray sheen observed in Heavily Vegetated Area, within the additional organoclay placement area (covering approximately 31-50% of a 2' x 1' area towards the downstream end). Sheen did not break when disturbed ("non-brittle")[1]. A sheen net sample was collected for laboratory analysis. Laboratory results will be reported in the next monthly report.

Sheen Sampling Results from Previous Monthly Report[3]:

- The laboratory analysis of a sheen net sample collected from Heavily Vegetated Area on November 23, 2015 indicated a combination of degraded crude oil from the Pegasus Pipeline and potential background anthropogenic sources.

Path Forward for January 2016:

- Continue biweekly sheen monitoring in Cove.

Silver Gray Sheen Patches/Streamers Observation on 12/22/2015

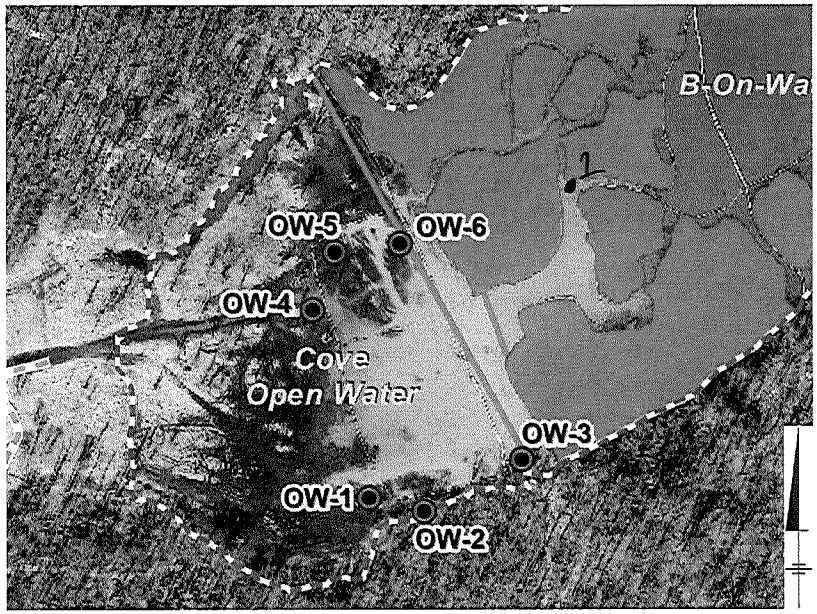
Notes:

1. Non-brittle sheens are often related to anthropogenic sources, including petrogenic sources (e.g., petroleum hydrocarbons).
2. Brittle sheens are often of natural biogenic origin.
3. Laboratory testing is required to distinguish sheen sources (e.g., crude oil, roadway runoff, natural biologic activity).
4. Sheen color (dark/metallic/rainbow/silver gray) and structure (patches/streamers/cover) terminology reference: NOAA 2007. NOAA Open Water Oil Identification Job Aid.

Sheen Observation Form

Personnel: Z. Powers J. Chiasson Date: 12/22/15

Wind Conditions: Windy/Light Breeze/Calm Temperature: 30°F Sky Conditions: Sun/Clouds/Part Sun/Part Clouds



LOCATION:	TIME:
If yes, sketch on Figure 1 to show approximate location	
Approximate size (dimensions)	
Over what percentage of surface?	Trace <1% ☐ 1-10% ☐ 11-30% ☐ 31-50% ☐ 50-70% ☐ >70% ☐
Color of sheen: Dark / Metallic / Rainbow / Silver Gray	
Sheen structure: No structure / Patches / Streamers / Tar Balls / Windrows	
Observations when sheen is disturbed: Breaks Apart/Brittle ☐	Does not Break/Non-Brittle ☐
If streamers are present, what is their orientation?	
Is sheen blossoming?	Yes ☐ No ☐
If yes, what is the frequency (per 15 minutes)?	
Sheen origination (if noticable)?	
Flow Condition:	
Picture taken	Yes ☐ No ☐
Action taken:	
Notes	

LOCATION: 1	TIME: 0955
Sketch on Figure 1 to show approximate location	
Approximate size (dimensions) 2' x 1'	
Over what percentage of surface?	Trace <1% ☐ 1-10% ☐ 11-30% ☐ 31-50% ☒ 50-70% ☐ >70% ☐
Color of sheen: Dark / Metallic / Rainbow / Silver Gray	
Sheen structure: No structure / Patches / Streamers / Tar Balls / Windrows	
Observations when sheen is disturbed: Breaks Apart/Brittle ☐	Does not Break/Non-Brittle ☒
If streamers are present, what is their orientation? NA	
Is sheen blossoming?	Yes ☐ No ☒
If yes, what is the frequency (per 15 minutes)? NA	
Sheen origination (if noticable)? NA	
Picture taken 27, 28, 29	Yes ☒ No ☐
Flow Condition: open water	
Action taken: sampled	
Notes SHN-COVE-0123(NB) 122215	

LOCATION:	TIME:
If yes, sketch on Figure 1 to show approximate location	
Approximate size (dimensions)	
Over what percentage of surface?	Trace <1% ☐ 1-10% ☐ 11-30% ☐ 31-50% ☐ 50-70% ☐ >70% ☐
Color of sheen: Dark / Metallic / Rainbow / Silver Gray	
Sheen structure: No structure / Patches / Streamers / Tar Balls / Windrows	
Observations when sheen is disturbed: Breaks Apart/Brittle ☐	Does not Break/Non-Brittle ☐
If streamers are present, what is their orientation?	
Is sheen blossoming?	Yes ☐ No ☐
If yes, what is the frequency (per 15 minutes)?	
Sheen origination (if noticable)?	
Picture taken	Yes ☐ No ☐
Flow Condition:	
Action taken:	
Notes	

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