

Enbridge Line 6B MP 608 Pipeline Release

Marshall, Michigan

Supplement to Operations and Maintenance Work Plan

Referred to as

2011 Containment Plan

Enbridge Energy, LP

March 4, 2011

Objectives

This work plan will document the containment plan for 2011. The objectives of this containment plan are:

- Personnel and public safety.
- Elimination of impact to downstream receptors.
- Facilitation of product recovery.
- Protection of critical areas from additional impact.

In order to meet these objectives the implementation of the necessary control measures will be required, this will include the following: site monitoring, control point booming, protective booming, adsorbent recovery, mechanical recovery and manual recovery (including Gabion Baskets).

Implementation

The following techniques and strategies will be utilized to implement the containment plan.

Monitoring

Site monitoring will be completed during the late winter and spring months, utilizing Air Operations, Vessels (airboats) as well as land based observation. During the monitoring, crews will observe river characteristics such as freezing, movement of flowing ice, debris movement (including vegetation/debris dislodged during spring runoff and accumulated organic matter), visual checking for the presence of surface hydrocarbon (oil/sheen) as well as subsurface hydrocarbon migration (submerged oil) via poling. The information collected during these activities will become a driver for the implementation of this plan determining the priority sequence and timing of containment deployment.

Control Point Booming

Control point booming is the use of containment boom, curtain boom, silt fence and X-Tex boom to prevent the downstream migration of surface and subsurface product. The control point booming, when properly deployed, will aid in facilitating the recovery of migrating surface and subsurface product. There are several booming strategies that will be used in control point booming, these are:

- Shore to Shore Booming (Photo Plate 1): In this strategy a single span of boom is deployed to cover the entire width of the river. The upstream end of the boom is secured to an anchor point on the upstream bank. Hand lines or in stream anchors are used to maneuver the boom at the appropriate angle (dependent on current velocity) down to a recovery area. A small section of boom is then deployed along the downstream shoreline to prevent impact to the river bank (shoreline protection).
- Gate Booming (also referred to as “Open Chevron”) (Photo Plate 2): In this strategy two segments of boom are deployed across the width of the river to allow for vessel traffic up and down the river. The upstream ends of both booms are secured in an overlapping

position using in stream anchors. Hand lines or in stream anchors are used to maneuver the boom at the appropriate angle (dependent on current velocity) down to a recovery area. A small section of boom is then deployed along the downstream shoreline to prevent impact to the river bank (shoreline protection).

- Cascade Booming (Photo Plate 3): The cascade system is the deployment of multiple booms across the width of the river to allow for vessel traffic up and down the river or to reduce the strain that current places on individual spans of boom. The upstream boom is secured to the shore at its upstream point. Using hand lines or in stream anchors the boom is maneuvered at an appropriate angle (dependent on current velocity) to a point in the river where it is secured with an in stream anchor. Each additional segment is then placed downstream in an overlapping position and secured with in stream anchors. The last span of boom is secured on its downstream end to the shore. A small section of boom is then deployed along the downstream shoreline to prevent impact to the river bank (shoreline protection).
- Chevron Booming (Photo Plate 4): In the chevron system a single span of boom is deployed to deflect product around a sensitive area or to recovery points on both banks. The center of the boom is secured in the middle of the channel using an in stream anchor. Hand lines or in stream anchors are used to maneuver both of the downstream booms at appropriate angles (dependent on current velocity) down to recovery areas. Small sections of boom are then deployed along the downstream shoreline to prevent impact to the river bank (shoreline protection).

Product collected by control point booming will be recovered using either hand skimming or by mechanical skimming devices if volumes warrant the use of mechanical equipment.

Control point booming location sites will be selected based on the following criteria:

- River characteristics (currents speed, depth, width and bottom material),
- Site access (ease of product recovery and maintenance),
- Suitable anchor points,
- Distance to upstream control points,
- Distance to upstream sources of impact (identified impacted depositional areas and impacted overbank areas),
- Access control to prevent impact to the public.

Currently seven control points have been identified as likely locations for installation of surface containment. This number is dependent on information gathered during spring monitoring activities and may vary. They are located at:

- MP-2.00, B 5 (confluence of Talmadge and Kalamazoo) (complete)
- MP-5.30, C 0.5
- MP-15.50, C 6 (Mill Ponds)(complete)
- MP-19.40, D 3(complete)
- MP-35.20, E 3 (complete)
- MP-36.50 (35th Street Bridge)
- MP-37.75, E 4

Due to land access issues, the control point located at E5 (Morrow Lake Dam) will not be installed. Based on visual inspections completed during 2010, surface product/sheen presence downstream of control point E4 is not anticipated. In the event that product migration occurs past control point E4, an additional boom would be installed between MP 38 and MP 38.5. This boom would extend from north to south, across the entire width of Morrow Lake. Due to the fluctuating weather conditions and strong winds encountered at Morrow Lake, the long term integrity of this boom would be of utmost concern. Increased anchoring along the length of the boom and constant monitoring to ensure integrity would be required. As a result, this control point would only be installed if containment at E4 is breached. Daily monitoring will determine if booming will be required downstream of E4. Based on the monitoring of this area, if sheen/product migration is encountered on Morrow Lake, additional booming would be completed downstream of the E4 control point and potentially downstream of the Morrow Lake Dam.

Enbridge will continue efforts, including reasonable compensation, to obtain access to the E5 containment location to allow for the installation of the Chevron boom at the downstream extent of Morrow Lake.

The containment planned for E4 consists of a shore to shore surface containment as well as shore to shore subsurface containment; the subsurface containment will be a combination of surface boom with X-Tex attached to the skirting. The downstream portion of the E4 containment (18" containment boom) will be positioned approximately 300' downstream of the X-Tex deployment. This will ensure that if the integrity of the X-Tex boom is compromised, the downstream deployment will remain intact.

MP 5.25 (CP 0.5) will consist of surface containment boom with X-Tex curtain attached to the skirting. No additional surface containment boom will be used.

Deployment at these locations is dependent on information gathered during monitoring activities and may vary pending the results of those activities.

Due to the increase in water levels associated with spring runoff, all control points will be installed at a greater angle than during winter conditions. This will lessen the force applied to them by the increased current velocity and reduce the risk of containment failure.

Subsurface containment may also be installed based on the monitoring and assessment activities. The locations of these sites would be based on the observations made by the monitoring team as well as the locations of any identified subsurface concerns. The C 0.5 (MP 5.25) and E 4 (MP 37.75) locations are identified as likely locations for the installation of X-Tex Curtain booms.

The delta area will be monitored during the break up period. If it is determined that there is a potential for re-impact an X-Tex curtain can be deployed from the 35th street bridge above the delta to MP 36.75.

All control points will be monitored for ice build up. If there is a significant ice build up the boom will be released to prevent an unsafe condition or uncontrolled containment failure.

Visual monitoring at areas downstream of the Morrow Lake Dam will also be completed and in the event sheen is noted, additional containment boom will be installed downstream, pending weather and site conditions when safe to do so.

Protective Containment

Protective containment is the use of surface and subsurface containment to prevent impact to a sensitive area. Containment is deployed between a source of impact and the selected area to shield the immediate area. This method would also be used to isolate previously impacted areas until recovery methods have been completed and regulatory sign off has been received. The containment will usually be deployed:

- At the mouth of an inlet (Photo Plate 5)
- Around the entire area (Photo Plate 6)
- In a chevron (see control point booming) upstream of the area.

The selection of locations for protective containment will be based on the following criteria:

- Areas where previous remediation work has been completed.
- Areas of known impact that remediation work has not yet been completed.
- Depositional areas that may be re-impacted during spring runoff.
- Areas of significant ecological value.

27 of these areas have already been identified. All sites have existing containment in place and will only require inspection and maintenance activities. These sites are:

- MP 2.5
- MP 2.75
- MP 3.25 R1
- MP 3.25 (Island A)
- MP 3.75 (Island C)
- MP 4.25 (Island E)
- MP 4.5 L1
- MP 4.5 IF
- MP 7.0
- MP 8.5
- MP 9.0
- MP 10.5
- MP 10.75
- MP 11.25
- MP 11.50
- MP 11.75
- MP 12.75
- MP 13.25
- MP 13.50
- MP 13.75
- MP 15.0 (L1)
- MP 15.0 (South Mill Pond)
- MP 15.25 (North Mill Pond)
- MP 17.0
- MP 19.25
- MP 21.50
- MP 28.25

Deployment at these locations is dependent on information gathered during monitoring activities and may vary pending the results of those activities. Additional areas may be added based on inspection results and the identification of unknown areas of impact. No protective containment will be installed between MP 28.25 and 36.75.

Product Recovery

Product recovery involves the removal of product from the water. Several recovery methods are listed below but will not be limited to:

- **Hand Skimming:** Hand skimming is the removal of product by physical labour. Personnel will utilize hand tools such as dip nets, strainers, and pitchforks to lift the product and debris out of recovery areas and place it into a container for disposal.
- **Gabion Baskets:** Gabion baskets are an upright in situ filtration system that utilizes adsorbent snare to remove submerged oil from the water column. The snare is secured to a chain link insert that is inserted into a frame that holds it upright in the water column. As water travels through the panel any particulate in the water column adheres to the snare and can be removed with the panel. The snare is collected and taken for disposal.
- **Rotary Skimming:** Rotary skimming is the removal of product by a mechanical rotary skimmer. There are several types of rotary skimmers including drum, mop skimmers and brush skimmers. All rotary skimmers work by rotating a surface with oil adhering qualities through the product. The product is then mechanically removed from the surface and collected into a container for disposal.
- **Vacuum Truck:** Utilizing a vacuum unit to suck free product or impacted sediment out of a containment area.

Currently C 0.5 (MP 5.25) has been identified as likely location for installation of a gabion basket system.

Deployment Priority and Scheduling:

Our priority sequence for deployment is as follows:

- Deployment of surface containment from downstream to upstream.
- Deployment of protective containment at areas of high ecological value.
- Deployment of protective containment from upstream to downstream.
- Deployment of submerged oil containment from downstream to upstream.
- Deployment of gabion baskets.

This sequence is based on several factors as listed below.

- Due to the fast break up of ice that occurred this year there has been very little scouring of the river bed in depositional areas. In large part this scouring is associated with submerged oil migration during spring runoff conditions.

- As temperatures rise, submerged oil particulate will begin to rise to the surface and sheen off. This sheen if not contained will migrate and impact downstream receptors.
- Surface containment is much faster to deploy than subsurface containment. By concentrating on surface containment first we can get more assets in the water at a faster rate.
- Installation of protective containment will prevent re-impact to areas of a high ecological value and sites that have already been worked on. Additionally by denying access to these natural collection areas product will be funnelled downstream to our existing control points for recovery.
- To limit the foot print of the spill as a whole we must prevent migration of free product beyond the spills current boundaries. By placing control points at the downstream end first, we prevent that migration.
- Areas requiring protection that are closer to the source of impact will be impacted first if not protected. The primary source of impact to the river at this time is currently the Talmadge Creek. Therefore protective containment must work from the upstream down.

The schedule for the containment plan will be based on the above priority sequence. The deployment of containment in spring conditions is largely dependent on fluctuating weather and river conditions and may be delayed by a down turn in either of these factors. Due to the potential for the formation of ice and or debris dams, booming activities will be triggered by the absence of the potential for migration of ice and or debris to downstream areas. If, due to fluctuations in the weather, the potential for ice or debris dams increases once deployment has begun, booming activities will be limited. Additionally, any already deployed boom will be monitored for a potential loss of integrity so that corrective actions can be taken.

We will be utilizing a control point team and protective containment team so these activities will take place simultaneously. Currently the order of deployment for control points will be:

- E 3.0 (MP 35.2) (Installed on February 18, 2011)
- B 5.0 (MP 2.1) (Reconfigured and restocked on February 22, 2011)
- D 3.0 (MP 19.4) (Installed on February 24, 2011)
- C 6.0 (MP 15.5) (Installed on February 25, 2011)
- C 0.5 (MP 5.25 Ceresco Dam)
- 35th Street (MP 36.75) (Pending ice melt)
- E 4.0 (MP 37.75) (Pending ice melt)

Protective containment will be completed in order of:

- | | |
|-----------------------------------|---------------------------|
| • MP 15.0 (Mill Pond) (complete) | • MP 11.75 (complete) |
| • MP 15.25 (Mill Pond) (complete) | • MP 12.75 (complete) |
| • MP 2.5 (complete) | • MP 13.25 (complete) |
| • MP 2.75 (Complete) | • MP 13.50 (complete) |
| • MP 3.25 (R1) (complete) | • MP 13.75 (complete) |
| • MP 3.75 (Island C) (complete) | • MP 15.0 (L1) (complete) |
| • MP 4.5 (complete) | • MP 17.0 (complete) |

- MP 7.0 (complete)
- MP 8.5 (complete)
- MP 9.0 (complete)
- MP 10.5 (complete)
- MP 10.75 (complete)
- MP 11.25 (complete)
- MP 11.50 (complete)
- MP 19.25 (complete)
- MP 21.25 (complete)
- MP 28.25 (complete)
- MP 3.25 (Island A) (complete)
- MP 4.25 (Island E) (complete)
- MP 4.5 (L1) (complete)

The gabion baskets will be deployed after the installation of C 0.5 (MP 5.25 Ceresco Dam) as to not interfere with the installation of that control point.

Special consideration will be given to:

- The safety of personnel working in, around and on the water.
 - Boat traffic will be kept to a minimum to reduce the risk to workers.
 - Marker buoys will be deployed upstream and downstream of all mid stream deployments.
 - A safety boat will be present during all on water operations.
 - If personnel are working in the water from the shoreline a tag line will be required.
 - Boats working in the vicinity of containment will do so under a no wake restriction with the exception of crossing the boom. Boom crossing will be done on step at the top end of the boom in the channel marked by marker buoys.
- The safety of the public
 - All sites that are accessible to the public will be clearly marked with signage warning of the dangers associated with site.
 - Public access will be limited during operations.

An adaptive management approach will be used in conjunction with the 2011 Containment Plan. This management strategy will allow for modifications to the approved plan to be made as warranted by field conditions. All changes made to the 2011 Containment Plan will be submitted to and be approved by the Federal On-Scene Coordinator (FOSC) before they are executed. Verbal notification and acceptance with written follow up will be completed to address changes to the plan.

Photo Plates



Photo Plate 1: Shore to Shore Booming System



Photo Plate 2: Gate Booming System (also referred to "Open Chevron")

Photo Plates



Photo Plate 3: Cascade Booming System



Photo Plate 3: Chevron Booming System

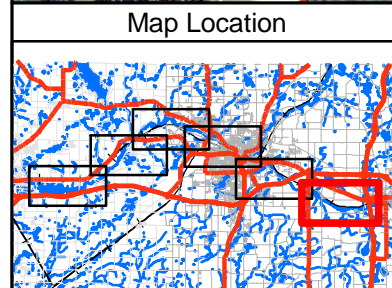
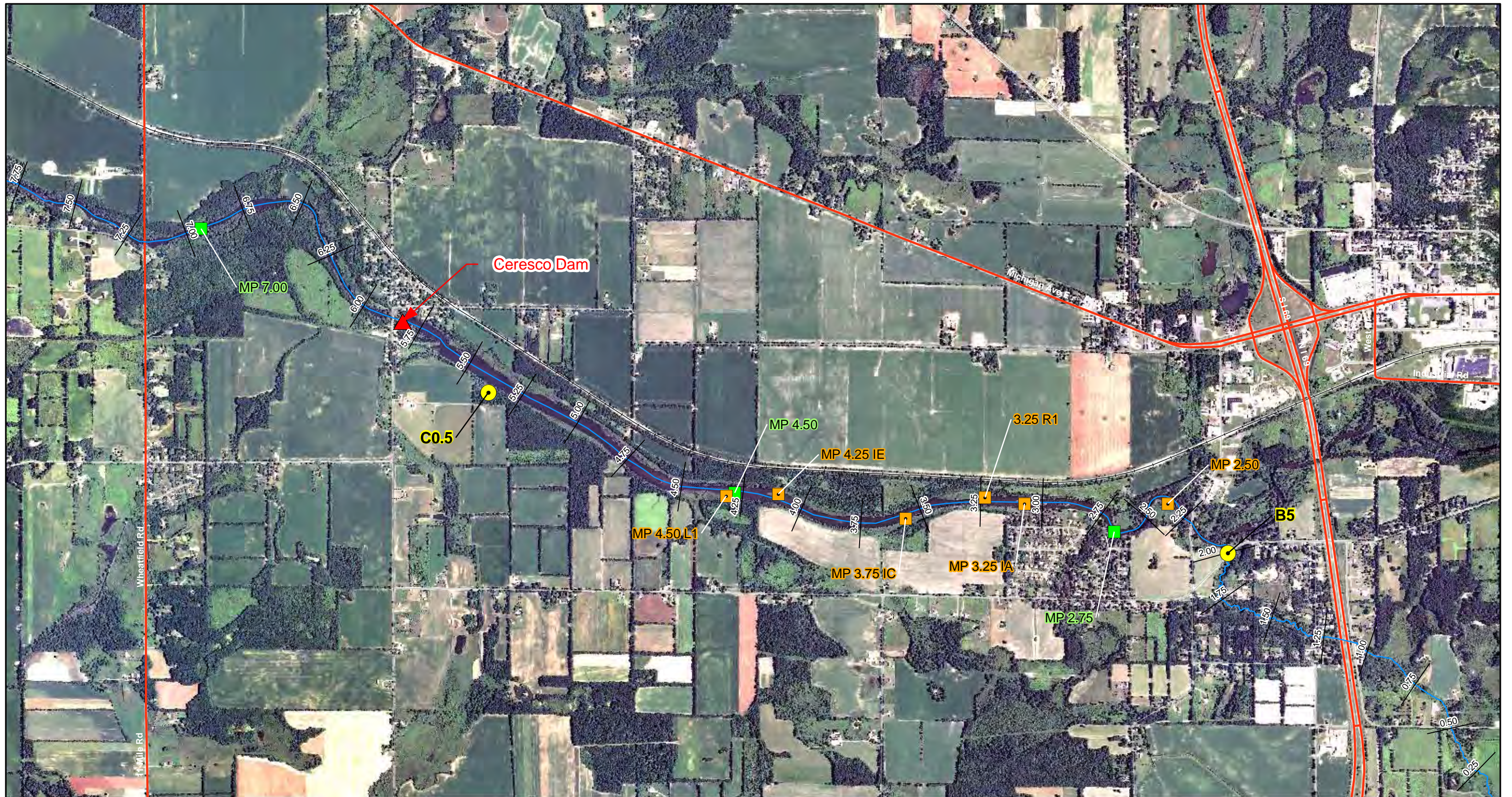
Photo Plates



Photo Plate 5: Protective Booming Mouth of an Inlet

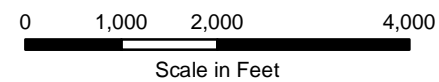


Photo Plate 6: Protective Booming Around Entire Area



Legend

- Control Point
- Protective Booming - Maintenance Only
- Protective Booming - Additional Protection Required
- Quarter Mile Grid Segments
- ~ River
- ▲ Key Areas Requiring a High Level of Protection

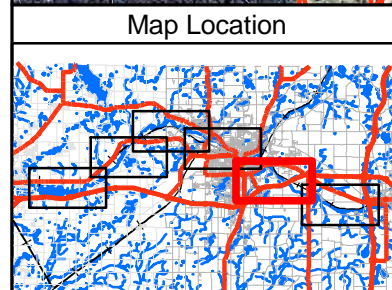
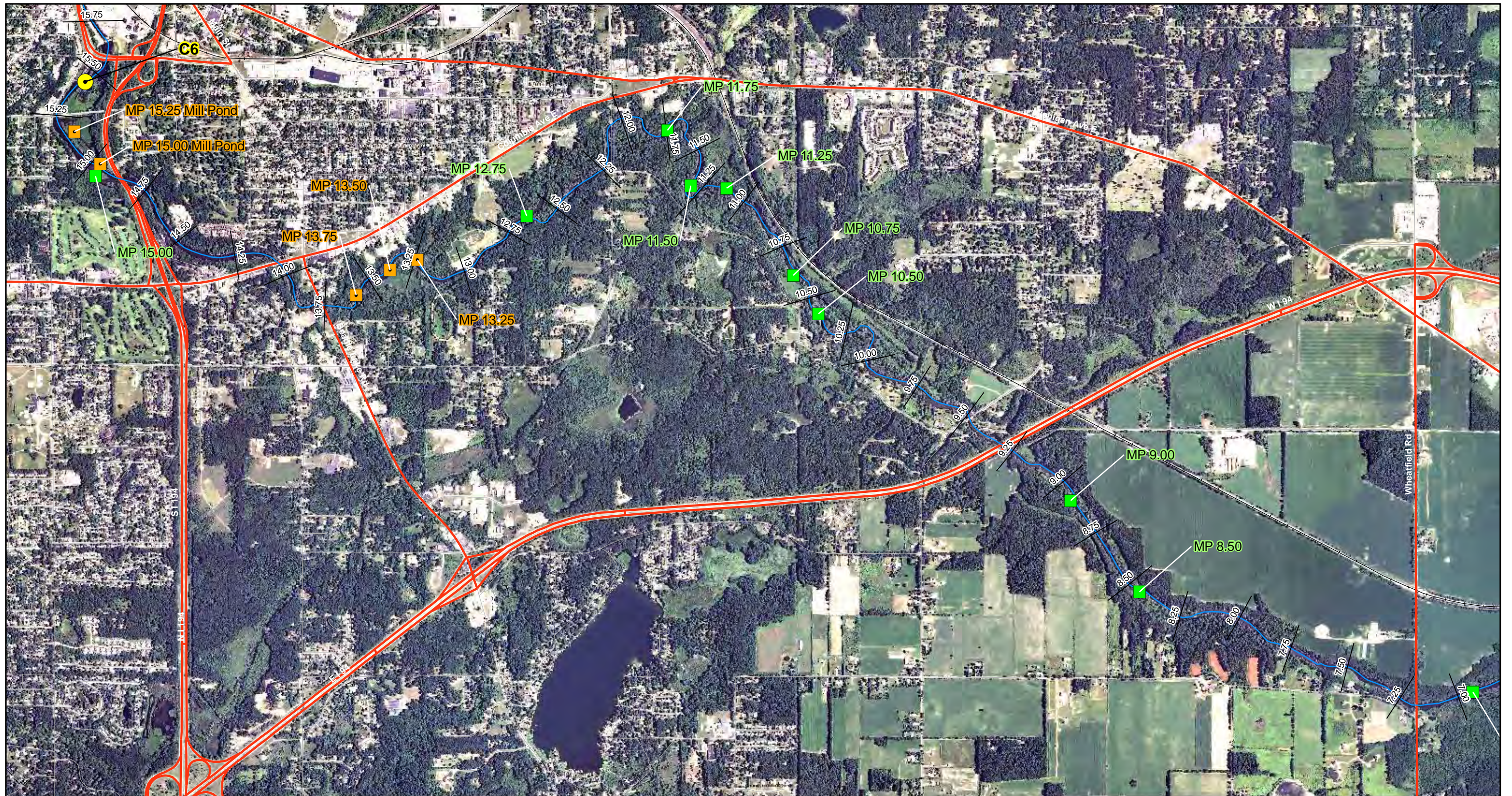


SPRING DEPLOYMENT
ENBRIDGE LINE 6B M 608 PIPELINE RELEASE
MARSHALL, MI

SHEET 1 OF 6



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Legend	
	Control Point
	Quarter Mile Grid Segments
	River
	Protective Booming - Maintenance Only
	Protective Booming - Additional Protection Required
	Key Areas Requiring a High Level of Protection

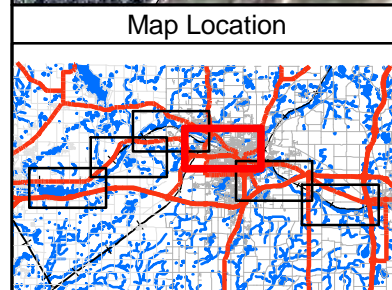
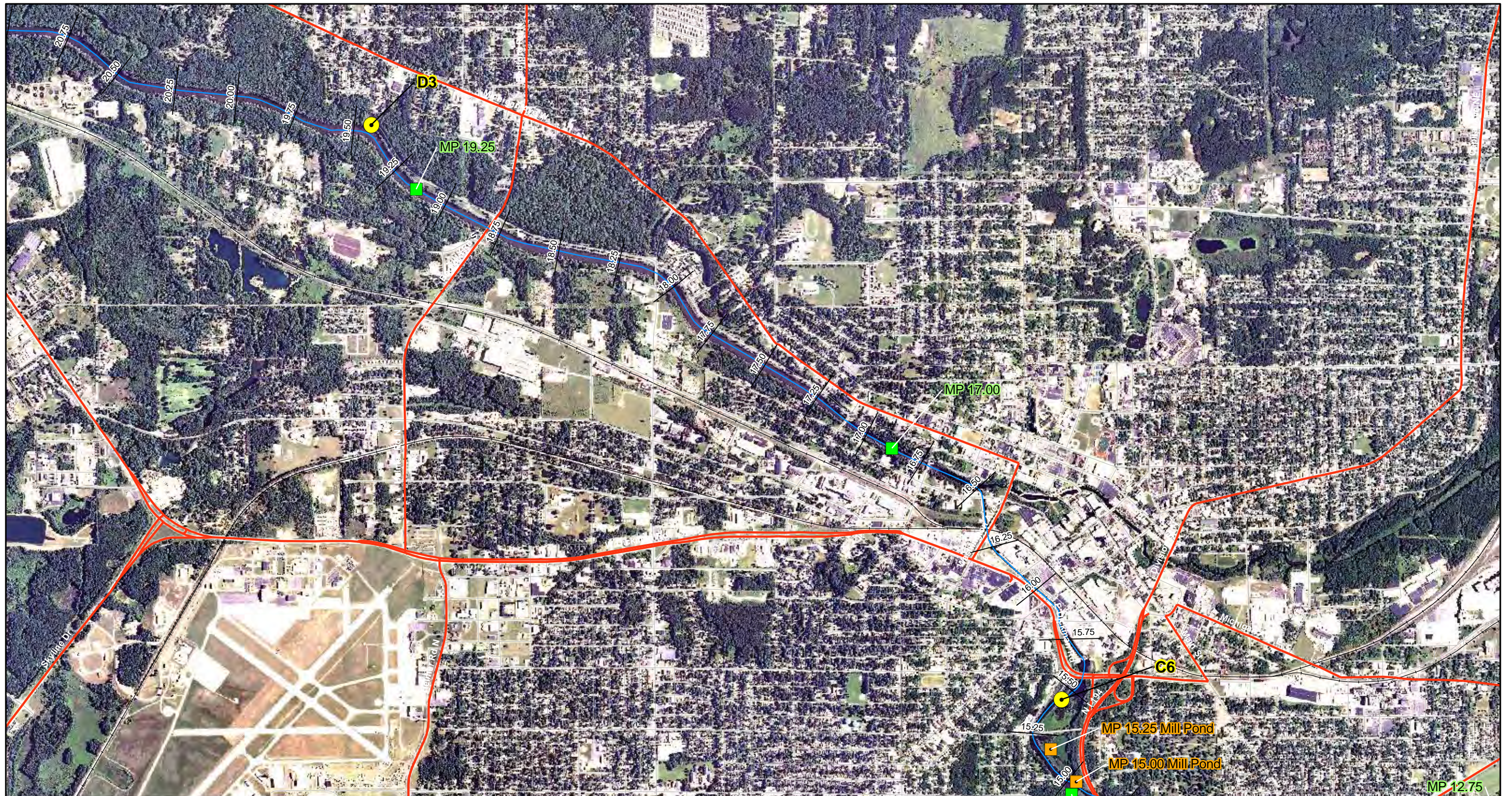
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SPRING DEPLOYMENT
ENBRIDGE LINE 6B M 608 PIPELINE RELEASE
MARSHALL, MI

SHEET 2 OF 6

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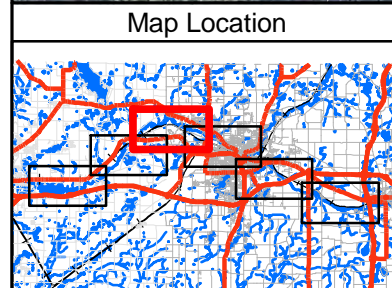
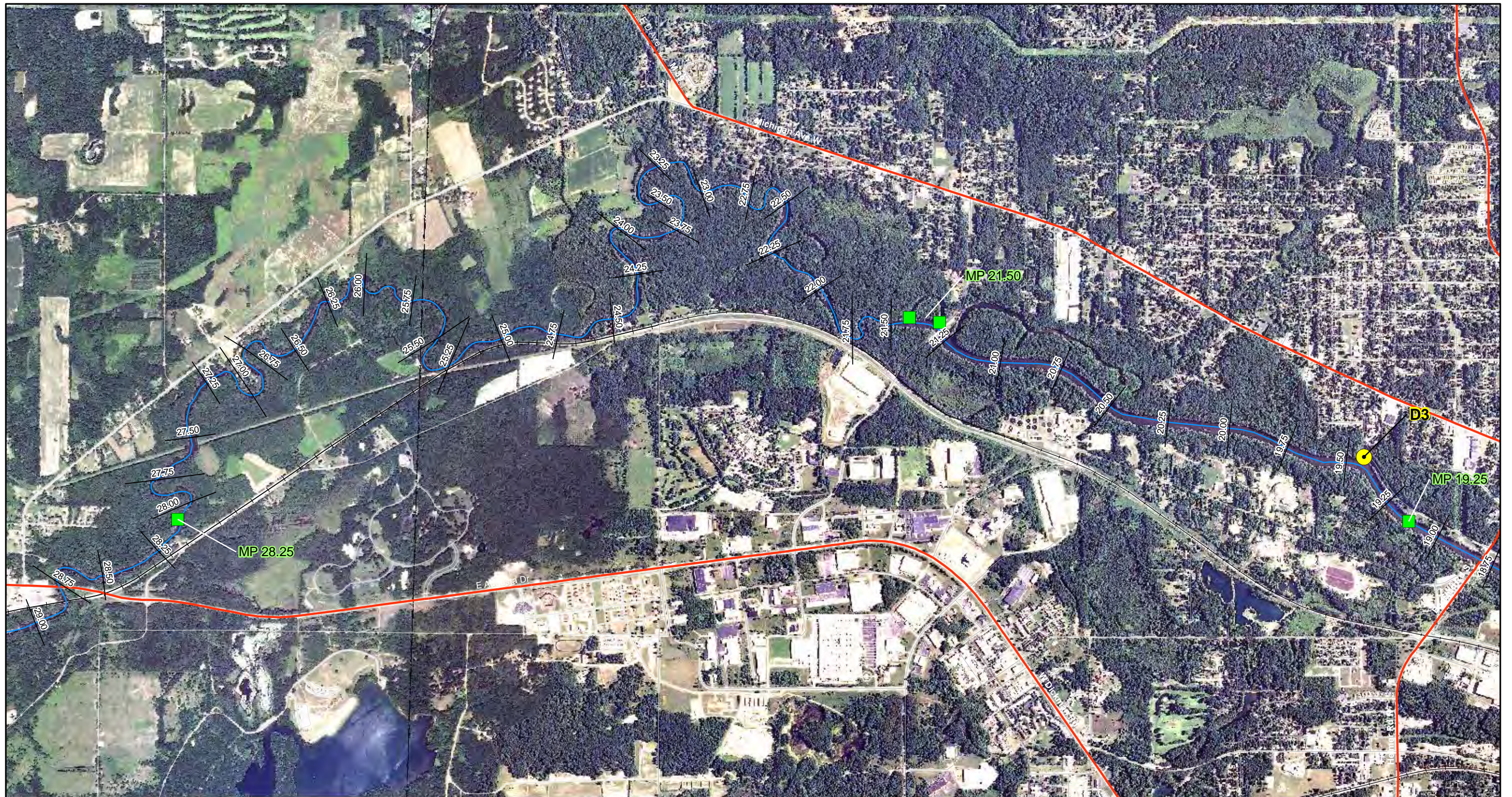
Map Location		Legend	
	Control Point		Protective Booming - Maintenance Only
	Quarter Mile Grid Segments		Protective Booming - Additional Protection Required
	River		Key Areas Requiring a High Level of Protection

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SPRING DEPLOYMENT
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SHEET 3 OF 6

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Legend	
	Control Point
	Quarter Mile Grid Segments
	River
	Protective Booming - Maintenance Only
	Protective Booming - Additional Protection Required
	Key Areas Requiring a High Level of Protection

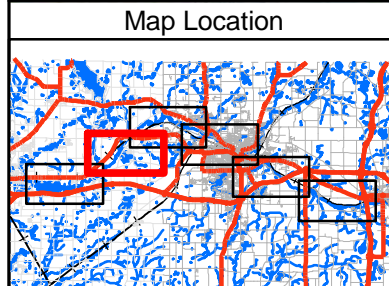
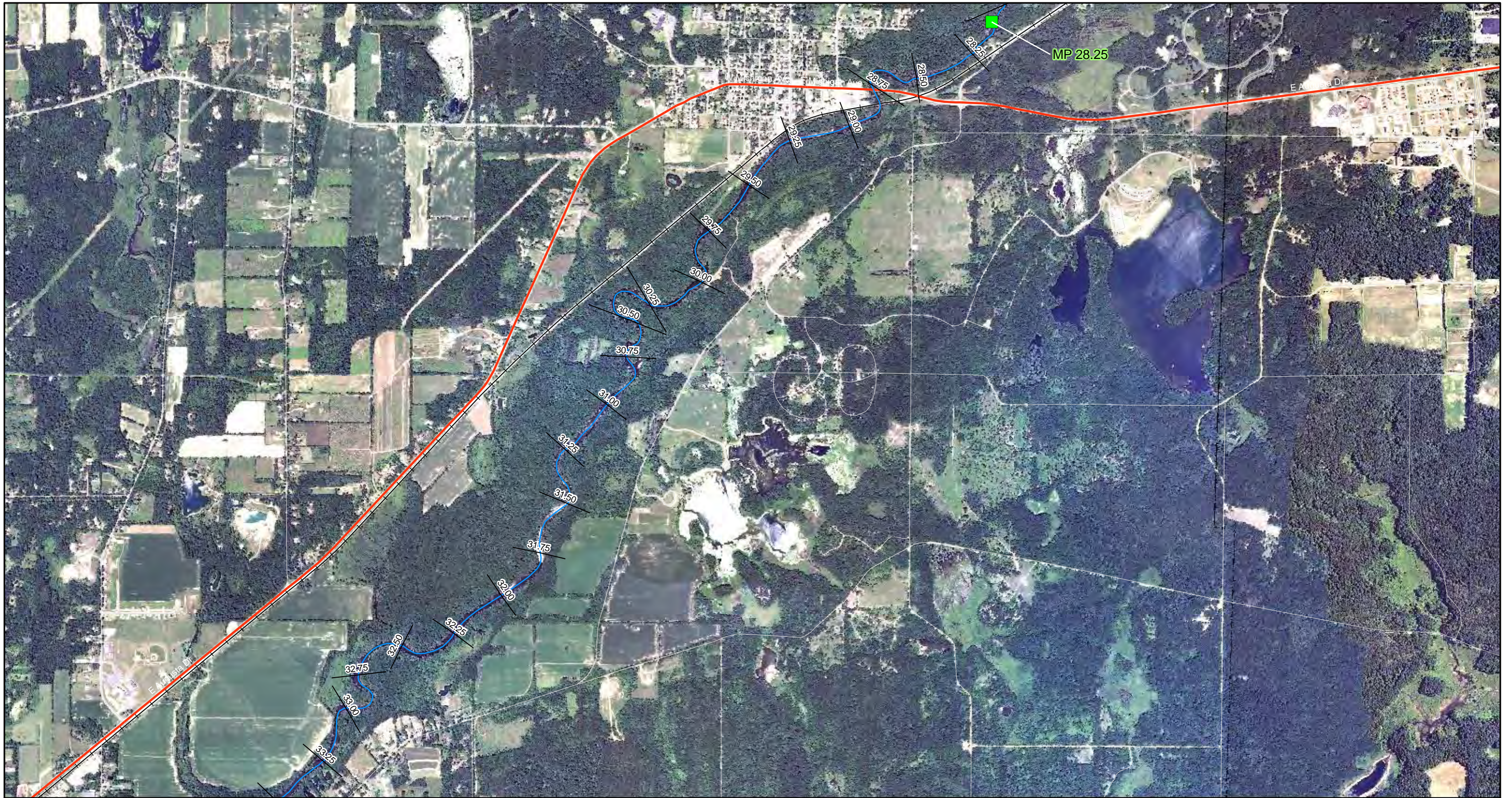
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SPRING DEPLOYMENT
ENBRIDGE LINE 6B M 608 PIPELINE RELEASE
MARSHALL, MI

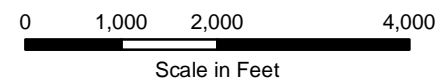
SHEET 4 OF 6

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Legend

- Control Point
- Protective Booming - Maintenance Only
- Quarter Mile Grid Segments
- Protective Booming - Additional Protection Required
- ~ River
- ▲ Key Areas Requiring a High Level of Protection

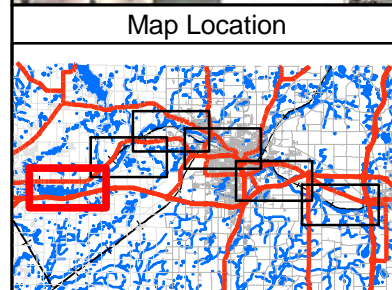
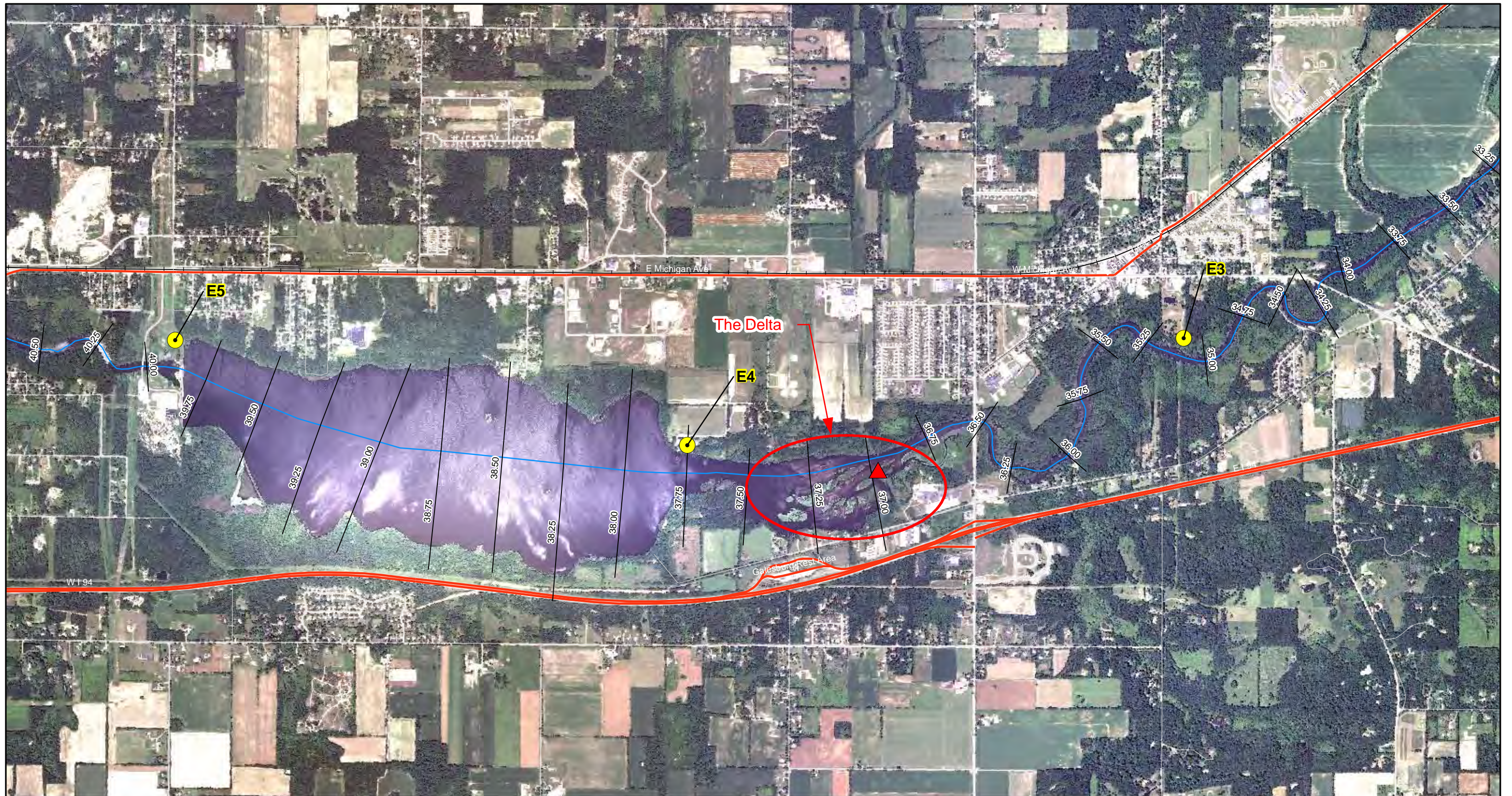


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SHEET 5 OF 6



Legend	
	Control Point
	Quarter Mile Grid Segments
	River
	Protective Booming - Maintenance Only
	Protective Booming - Additional Protection Required
	Key Areas Requiring a High Level of Protection

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SPRING DEPLOYMENT
ENBRIDGE LINE 6B M 608 PIPELINE RELEASE
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SHEET 6 OF 6

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