



## Downstream Parcels Monitoring Report

GM CET Bedford Facility

105 GM Drive

Bedford, Indiana

EPA ID# IND006036099

AOC Docket No. RCRA-05-2014-0011

Prepared for GM LLC

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# Acronyms

AOC	Administrative Order on Consent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRA	Conestoga-Rovers & Associates
GCL	Geosynthetic Clay Liner
GHD	GHD Services. Inc.
GM	General Motors, LLC
H	Height
IDNR	Indiana Department of Natural Resources
MMP	Monitoring and Maintenance Plan
PBCs	Polychlorinated Biphenyls
RA	Downstream Parcels Removal Action
RACER	Revitalizing Auto Communities Environmental Response
Report	Downstream Parcels Monitoring Report
V	Vertical

# 1. Introduction

GHD Services, Inc. (GHD), on behalf of General Motors, LLC (GM), has prepared this Downstream Parcels Monitoring Report (Report) documenting the results of inspections conducted on May 27, 2015 and September 16 and 17, 2015 for select properties on which restoration is managed by GM. These properties are part of the Downstream Parcels identified in the Downstream Parcels Removal Action (RA) Work Plan and are adjacent to Bailey's Branch Creek and Pleasant Run in Lawrence County, Indiana.

In accordance with the Monitoring and Maintenance Plan (MMP) – Downstream Parcels, dated November 7, 2014 (CRA, 2014a), this Report addresses Parcels 15, 21, 24, 25, 29, 30, 36, 40, 72, 81, and 216. The remaining Downstream Parcels (13, 20, 23A, 27, 28A, 37, 39, 76, and 78) were transferred to Revitalizing Auto Communities Environmental Response (RACER) Trust and are not addressed in this Report. Figure 1 identifies the Downstream Parcels managed by GM.

# 2. Background

## 2.1 Overview

The Downstream Parcels RA included the excavation of impacted soil, verification that each excavated area achieved the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Administrative Order on Consent (AOC) cleanup criteria, staging of waste, waste characterization sampling and analysis, transportation and disposal of the material at appropriate permitted landfill facilities, backfilling of the excavations, and restoration of the GM owned and third-party owned properties. The RA is described more fully in the Construction Certification Report Downstream Parcels Removal Action, dated December 12, 2014 (CRA, 2014b). Where applicable, restoration of third-party owned Parcels was based on Access Agreements signed by the individual Parcel owners and General Motors Corporation. Although the Access Agreements contain similar elements, each privately owned Parcel had some unique restoration requests/requirements.

## 2.2 Backfilling, Creek and Creek Bank Restoration

The creek channel<sup>1</sup>, bank, and floodplain were restored using materials similar to those present in the creek prior to the RA. Backfill materials were screened for desired chemical and geotechnical properties prior to being brought on-Site for use in the restoration activities. Soil, gravel and rock for the restoration were provided by Ben's (previously Ingram's) Quarry, located in Springville, Indiana.

Clean fill, mixed with rock/gravel substrate, as appropriate, was placed in the creek channel where soil was removed, upstream of the Peerless Road Bridge. Restoration of the creek channel downstream of the Peerless Road Bridge (Parcel 40) was brought back to similar pre-construction elevations using a combination of gravel, riprap, and soil.

The floodplain adjacent to the creek was restored to generally similar pre-construction elevations using imported common fill, overlain by a minimum 6 inches of topsoil. The floodplain was graded to drain to the creek system.

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<sup>1</sup> The term creek channel used in this Report refers to Tributary 3, Bailey's Branch Creek and Pleasant Run Creek

A series of cascading ponds were constructed on Parcels 24 and 25. Habitat enhancement features were installed in the ponds as well as in the creek channel to attract and provide habitat for a diversity of wildlife species. Habitat features included vortex weirs, vernal ponds, root wads, snags, and perches. Wetlands as well as ponds were established in these areas.

To prevent excessive erosion and to allow the creek banks to reach a naturally stable condition, planting was completed following backfilling and grading operations. The surface of the creek banks was overlain with a biodegradable erosion control protection (blankets, hydroseed with tackifier and straw) after planting, where required by the design, to provide initial erosion protection for approximately two growing seasons.

The creek banks were sloped to provide stability during large flow events. In areas where the creek banks were originally unstable and showing visible signs of erosion (portions of the creek in Parcels 21, 24, and 25), the creek banks were protected either utilizing a natural but constructed bank stabilization structure (i.e., root wads, log deflectors, limestone slab banks, etc.) or were graded back to a slope no greater than 1V:2H. The bank stabilization features also provide in-stream habitat for aquatic biota.

Restoration of Tributary 3 and Bailey's Branch Creek on Parcels 15 and 216 varied from the standard restoration approach, because of polychlorinated biphenyls (PCBs) detected in water emanating from Spring 018, which are believed to originate from the entrained PCB-contaminated sediment/clay material residing within the hydrogeologically active bedrock fractures between the various swallet locations along Bailey's Branch/Tributary 3 and Spring 018. Restoration included sealing the creek channel with a layer of concrete and geosynthetic clay liner (GCL) in some sections near Spring 018 on Parcel 15 to seal former swallet pathways in the main creek channel. This section of Bailey's Branch incorporated formed concrete bumps and nodules for the purpose of retaining sediments during baseflow conditions. Concrete sealing activities are summarized in the Concrete Sealing Construction Certification Report (CRAC, 2014).

### 2.3 General Site Re-Vegetation

A variety of seed mixes were used to stabilize and provide ground cover for the restored areas. The specific mix used was dependent on the hydrologic regime, future use of the area, the slope of the restored area, and specific requests made by property owners. A few property owners requested a variety of seed mixes including a pasture seed mix, a turkey/deer seed mix, and a soybean/wheat seed mix. Further, some property owners also requested that trees not be planted on their properties. The remaining seed mixes were designed to provide natural ground cover for a variety of different habitats (i.e., riparian forest, sloped forest, and emergent wetlands).

Trees were planted on Parcels owned by third parties that granted GM access. Table 1 identifies the seed mixes and trees planted for the Downstream Parcels managed by GM.

## 3. Restoration Monitoring

### 3.1 Creek Stabilization

The stability of the channel and banks of Tributary 3, Bailey's Branch Creek, and Pleasant Run Creek was evaluated during the inspections conducted in May and September 2015. A photographic log was completed along the creek channel to document its stability. The

photographic log is provided in Appendix A. Minor signs of erosion along the creek banks (e.g., rill erosion, local scour) and floodplain were documented. The presence or absence of pool-riffle sequences was also assessed. It should be noted that natural processes were expected to modify the creek through time and the weirs (i.e., rock current deflectors installed to create pool-riffle sequences) placed during restoration were expected to be altered, moved, or even removed as part of natural processes. With the exception of Bailey's Branch Creek on Parcel 25 (see discussion below), the channels of Tributary 3, Bailey's Branch Creek, and Pleasant Run Creek have not moved or shifted significantly since the restoration activities were completed. As expected, the creek substrate within the creek channel has sorted itself. The photographic log presented in Appendix A illustrates the creek substrate at various locations along the creek. The portions of Bailey's Branch Creek and Pleasant Run Creek on the Downstream Parcels managed by GM are discussed below.

Parcels 15, 21, and 216 were evaluated as a single unit. In-stream features on Parcel 15 include two waterfalls and a permanent pond. Portions of the channel on Parcels 15 and 216 consist of sealed concrete. The waterfalls, pond, and sealed portions of the channel, which are in Tributary 3 and Bailey's Branch, were evaluated during the inspections conducted in May and September 2015 and were found to be stable and functioning as designed. No in-stream features were constructed on Parcels 21 and 216. The banks and channels of Tributary 3 and Bailey's Branch Creek on Parcels 15, 21, and 216 are stable with no signs of bank failure or significant erosion.

No portion of the restored channel of Bailey's Branch is within the boundaries of Parcel 24.

In-stream features on Parcel 25 consist of two open water ponds. Water levels of the ponds are controlled by two concrete outflow structures. The concrete structure for the downstream pond has developed large surface cracks. In addition, a channel has been cut through the west side of the structure, allowing water to flow freely around the outflow structure, resulting in a relatively low water depth in the lower pond. The concrete overflow structure for the upstream pond is intact and is functioning as designed. The banks of the two ponds are stable with no signs of failure or significant erosion.

A portion of the restored channel for Bailey's Branch Creek is on Parcel 25. This channel was originally constructed as a diversion channel during the RA. Log vortex weirs and log deflectors were placed in the channel during restoration. Flow in Bailey's Branch Creek has since naturally cut a new channel that directs flow onto Parcel 23A (not maintained by GM) and into the upstream open water pond on Parcel 25. What used to be the restored channel on Parcel 25 is now dry and supports an upland plant community.

Parcels 29, 30, 36, and 72 were evaluated as a single unit. Bailey's Branch forms a confluence with Pleasant Run in the southern portion of Parcel 36. A number of rock vortex weirs and log current deflectors were installed as part of the restoration on these Parcels to promote the formation of pool-riffle sequences within the channel. The vortex weirs and large number of the log deflectors remain largely intact and are documented in the photographic log in Appendix A. The banks and channels of Bailey's Branch Creek and Pleasant Run Creek on Parcels 29, 30, 36, and 72 are stable with no signs of bank failure or significant erosion.

In-stream features of Pleasant Run on Parcel 40 include one concrete culvert crossing and one low flow channel crossing. Both of the crossings were evaluated during the May and September 2015 inspections and were found to be functioning as designed. Only the uppermost 30 percent of the banks were seeded following restoration. As a result, the lower 70 percent of the banks remain



unvegetated. Despite the absence of vegetation on the lower banks, no signs of significant erosion or bank failure were observed during the May and September 2015 inspections.

No portion of the restored channel of Pleasant Run is within the boundaries of Parcel 81.

### 3.2 Vegetation Coverage

Areas adjacent to the restored creek channel (riparian zone) on Parcels 24, 25, 29, 40, and 81 were re-vegetated after completion of the RA by applying diverse seed mixes of native grasses and forbs and planting trees to promote succession to re-establish native habitats. Due to the relatively small size of the restored riparian zones, ground truthing during the monitoring events encompassed the entire riparian area restored on these Parcels. Portions of Parcel 81 disturbed during the RA, which does not include the creek channel, were seeded. Parcels 15, 21, and 216 were not seeded or planted and were allowed to re-vegetate via natural processes. Vegetation coverage on Parcels 30 and 36 were not evaluated due to disturbance of the vegetation by the landowners. A small portion of Parcel 72 is included in the Downstream Parcels. Disturbance and subsequent restoration of Parcel 72 were minimal.

For grasses and forbs, the relative abundance of each species observed was assigned a value between 1 and 6 based on the abundance categories of Simon et al. (2001). The guidelines utilized to describe the species abundance categories for grasses and forbs on are presented in Table 2. Each species observed was noted as either included in the specified seed mix or as a volunteer. Species identified by the Indiana Department of Natural Resources (IDNR) as invasive to Southern Indiana, if present, were noted (Nice, 2006). The percent of aerial coverage of grasses and forbs within each cover type was estimated by visual inspection and recorded on the monitoring forms, which are provided in Appendix B.

Monitoring of trees consisted of identifying the species present and evaluating survival of seedlings planted on Parcels 25, 29, and 81. Trees were not planted by GM on Parcels 15, 21, 24, 40, and 72. Trees were planted on Parcels 30 and 36; however, as stated above, vegetation on these two Parcels was not monitored due to activities by the landowners who have disturbed the restoration vegetation. Survival of trees was assigned to one of four survival classes, as defined in Table 3. In addition to noting the survival of the specimens planted, shrubs and trees that have naturally colonized the Parcels inspected (volunteers) were identified and noted on the monitoring forms (Appendix B).

Appendices B1 and B2 are the completed Vegetation Monitoring Forms for Parcels 14, 21, and 215 for the May and September 2015 inspections, respectively. Disturbance of riparian vegetation on these Parcels during the RA was minimal. Those areas that were disturbed were allowed to naturally re-vegetate. In addition to the riparian areas adjacent to Tributary 3 and Bailey's Branch Creek, portions of the creek channel have become vegetated. Although these Parcels were not seeded, vegetation coverage in the riparian area is greater than 95 percent. Shrubs and trees that have colonized the area include multiflora rose, sycamore, tulip poplar, and willow.

Appendices B3 and B4 are the completed Vegetation Monitoring Forms for Parcel 24 for the May and September 2015 inspections, respectively. Grasses and forbs identified during the Site inspections consist of species in the meadow seed mix and volunteers. Coverage of grasses and forbs is greater than 95 percent. Trees were not planted on Parcel 24. Multiflora rose and sycamore have colonized this Parcel.

Appendices B5 and B6 are the completed Vegetation Monitoring Forms for Parcel 25 for the May and September 2015 inspections, respectively. Grasses and forbs identified during the Site inspections consist of species in the meadow and wetland seed mixes and volunteers. Coverage of grasses and forbs is greater than 95 percent. Trees and shrubs were planted on Parcel 25 adjacent to the former diversion channel. Survival of the planted trees and shrubs is less than 25 percent. However, aspen, elm, honey locust, redbud, and sycamore have naturally colonized this Parcel.

Appendices B7 and B8 are the completed Vegetation Monitoring Forms for Parcel 29 for the May and September 2015 inspections, respectively. Grasses and forbs identified during the Site inspections consist of species in the riparian forest and slope forest seed mixes and volunteers. Coverage of grasses and forbs is greater than 95 percent. The tree planting plan for Parcel 29 was included in the planting for Parcel 30. As such the number of trees planted on Parcel 29 was not documented during restoration. However, tree guards to protect seedlings are still present on Parcel 29, which allowed evaluation of survival. Species alive at the time of the May and September 2015 inspections are black gum and Shumard oak. Survival is approximately 26 percent to 50 percent.

Appendices B9 and B10 are the completed Vegetation Monitoring Forms for Parcel 40 for the May and September 2015 inspections, respectively. Grasses and forbs identified during the Site inspections consist of species in the riparian forest seed mix and volunteers. Overall coverage of grasses and forbs is 85 percent to 90 percent. There are limited areas where coverage is 50 percent to 75 percent. Trees on Parcel 40 were planted by the landowner. Trees observed during the Site inspections included honey locust, aspen, willow, red oak, bur oak, and red maple. Survival of trees appeared to be in the 51-75 percent survival class.

As discussed above, disturbance during the RA and subsequent restoration of Parcel 72 were minimal. The portion of the Parcel 72 within the assessment currently exists as mature forest.

Appendices B11 and B12 are the completed Vegetation Monitoring Forms for Parcel 81 for the May and September 2015 inspections, respectively. Grasses identified during the Site inspections consist of species in the riparian forest seed mix and volunteers. All forbs observed are volunteers. The restored areas on Parcel 81 appear to be periodically mowed, as evidenced by the absence of standing vegetation at the time of the September 2015 inspection. Coverage of grasses and forbs is greater than 95 percent. The landowner has planted blue spruce along the perimeter of Parcel 81. Survival of trees planted along the perimeter of Parcel 81 is greater than 75 percent.

## 4. Restoration Maintenance

Overall, the banks and channel of Tributary 3, Bailey's Branch Creek, and Pleasant Run Creek in the Downstream Parcels managed by GM are functioning as designed and do not require maintenance.

On Parcel 25, relatively large cracks have developed in the concrete outflow structure for the lower pond. Moreover, a channel has developed on the west side of the outflow structure, which results in a lower water level in the upstream pond than originally designed. These developments do not affect the integrity of Bailey's Branch Creek.

On Parcel 40, seeding was applied only on the upper 30 percent of the banks. Although the lower 70 percent of the banks remain unvegetated, significant bank failure or erosion was not observed

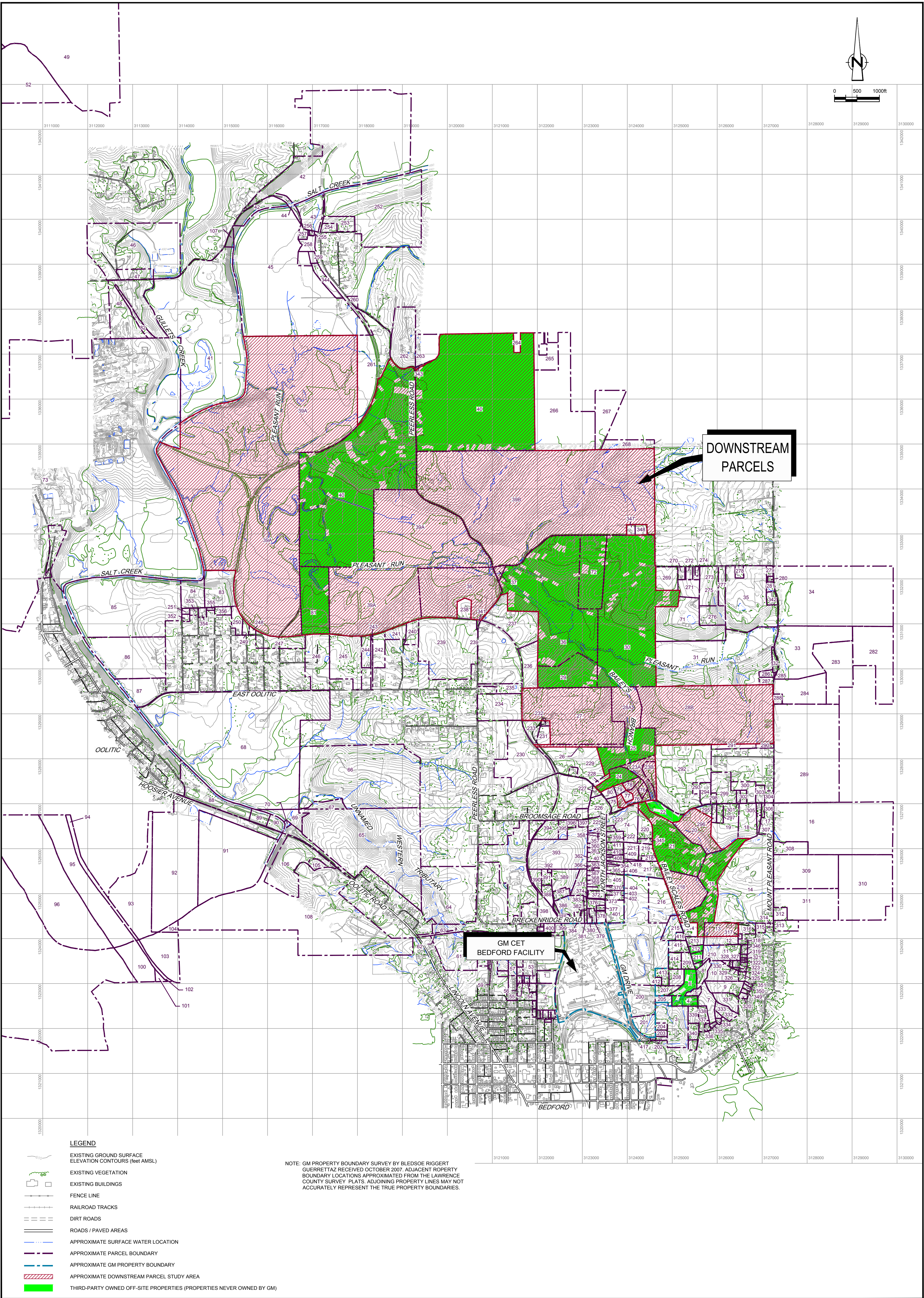
during either the May or September 2015 inspections. As lower banks are likely to become vegetated over time, maintenance is not required.

Vegetation cover on the Downstream Parcels managed by GM is at least 85 percent. No invasive species were observed during the May and September inspections. Therefore, maintenance of the vegetation cover is not required on the Downstream Parcels.

## 5. References

- Conestoga-Rovers & Associates. 2014a. Monitoring and Maintenance Plan (MMP) – Downstream Parcels. GM CET Bedford Facility. November 7, 2014.
- Conestoga-Rovers & Associates. 2014b. Construction Certification Report Downstream Parcels Removal Action. GM BET Bedford Facility. December 12, 2014.
- Conestoga-Rovers & Associates. 2014c. Concrete Sealing Construction Certification Report. February 10, 2014.
- Nice, G. 2006. Noxious and invasion weeds and weed laws in Indiana. Purdue Extension Weed Science. Revised 12/06.
- Simon, T.P., Stewart, P.M., and Rothrock, P.E. 2001. Development of multimetric indices of biotic integrity of riverine and palustrine wetland plant communities along Southern Lake Michigan. Aquatic Ecosystem Health and Management 4: 293-309.







Nº	Revision		Date	Initial	SCALE VERIFICATION		GM CET BEDFORD FACILITY BEDFORD, INDIANA				
					THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY. 						
					Approved		DOWNSTREAM PARCELS	Source Reference: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI. APRIL 2001			
							Project Manager: J.D.				
							Reviewed By: P.G.				
							Date: MARCH 2014				
							Scale: AS SHOWN				
							Project Nº: 17368-20				
							Report Nº: 009				
					Drawing Nº: figure 1						
						DOWNSTREAM PARCELS LOCATION MONITORING AND MAINTENANCE PLAN					



Table 1

**Seeding and Tree Summary**  
**Downstream Parcels Monitoring and Maintenance**  
**GM CET Bedford Facility**  
**Bedford, Indiana**

<b>Downstream Parcels</b>	<b>Seeding</b>	<b>Trees/Seedlings</b>
15	Natural Succession	None Planted
21	Natural Succession	None Planted
24	Meadow Seed Mix	None Planted
25	Meadow Seed Mix Wetland Seed Mix	Planted by GM
29	Riparian Forest Seed Mix Slope Forest Seed Mix	Not Documented <sup>1</sup>
30	Riparian Forest Seed Mix Slope Forest Seed Mix	Disturbed by Land Owner
36	Emergent Wetland Seed Mix Riparian Forest Seed Mix Slope Forest Seed Mix	Disturbed by Land Owner
40	Temporary Cover Seed Mix Riparian Forest Seed Mix	Planted by Land Owner
72	Slope Forest Seed Mix	Not Documented <sup>2</sup>
81	Riparian Forest Seed Mix	Planted by GM
216	Natural Succession	None Planted

<sup>1</sup> - Number of trees identified on restoration plant includes Parcel 29 and Parcel 30

<sup>2</sup> - Number of trees identified on restoration planted included Parcel 36 and Parcel 72



**Table 2**

**Species Abundance Categories for Grasses and Forbs  
Downstream Parcels Monitoring and Maintenance  
GM CET Bedford Facility  
Bedford, Indiana**

<b>Abundance Rating</b>	<b>Abundance Category</b>	<b>Description</b>
1	Observed	1 individual of a species present
2	Rare	2-4 individuals of a species present
3	Rare/Common	> 4 individuals of species present, but not enough to be categorized as "common"
4	Common	Species in easily located
5	Very Common	Species is slightly dominant; up to 25% of the plant community
6	Abundant	Species accounts for 25 - 100% of the plant community

Source: Simon et al. (2001)

**Table 3**

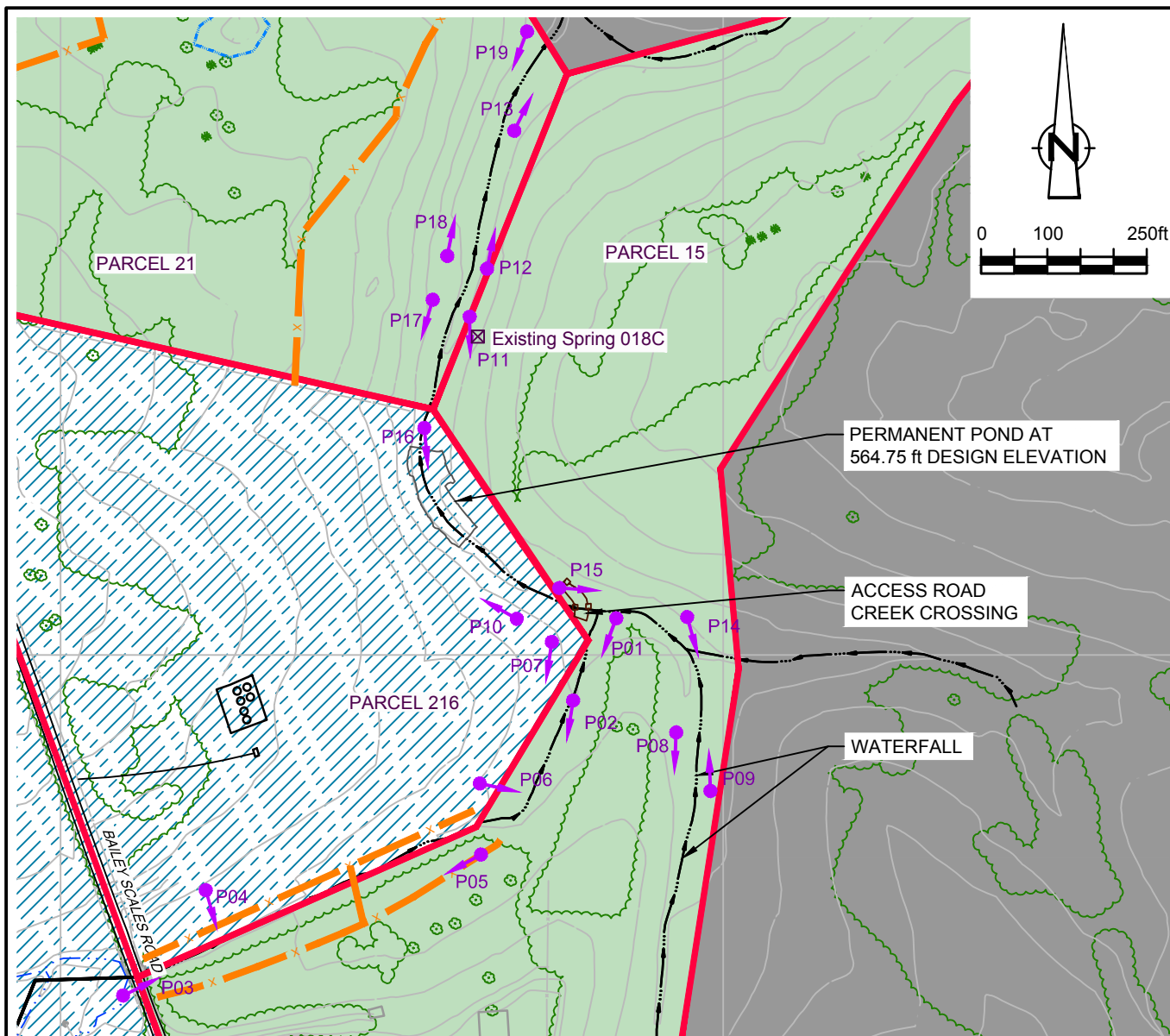
**Survival Classes for Trees  
Downstream Parcels Monitoring and Maintenance  
GM CET Bedford Facility  
Bedford, Indiana**

<b>Survival Class</b>	<b>Range of Percent Survival</b>
1	0 -25%
2	26 - 50%
3	51 - 75%
4	76 - 100%

# Appendices

# Appendix A

## Photographic Log



SOURCE: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI.  
APRIL 2001 AND CRA SURVEYS 2002 TO 2005

NOTE: BOUNDARY BETWEEN PARCELS 14 AND 15 SURVEYED BY  
BLEDSE RIGGERT GUERRETTAZ (APRIL 2011). ADJACENT  
PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM  
THE LAWRENCE COUNTY SURVEY PLATS. ADJOINING  
PROPERTY LINES MAY NOT ACCURATELY REPRESENT  
THE TRUE PROPERTY BOUNDARIES.

#### LEGEND

	EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
	EXISTING VEGETATION
	EXISTING BUILDINGS
	FENCE LINE
	RAILROAD TRACKS
	DIRT ROADS
	ROADS / PAVED AREAS
	APPROXIMATE SURFACE WATER LOCATION
	APPROXIMATE PARCEL BOUNDARY
	NEW FENCE
	DIRECTION OF VIEW AND NUMBER OF PHOTOGRAPH TAKEN P05
	CREEK CENTER LINE

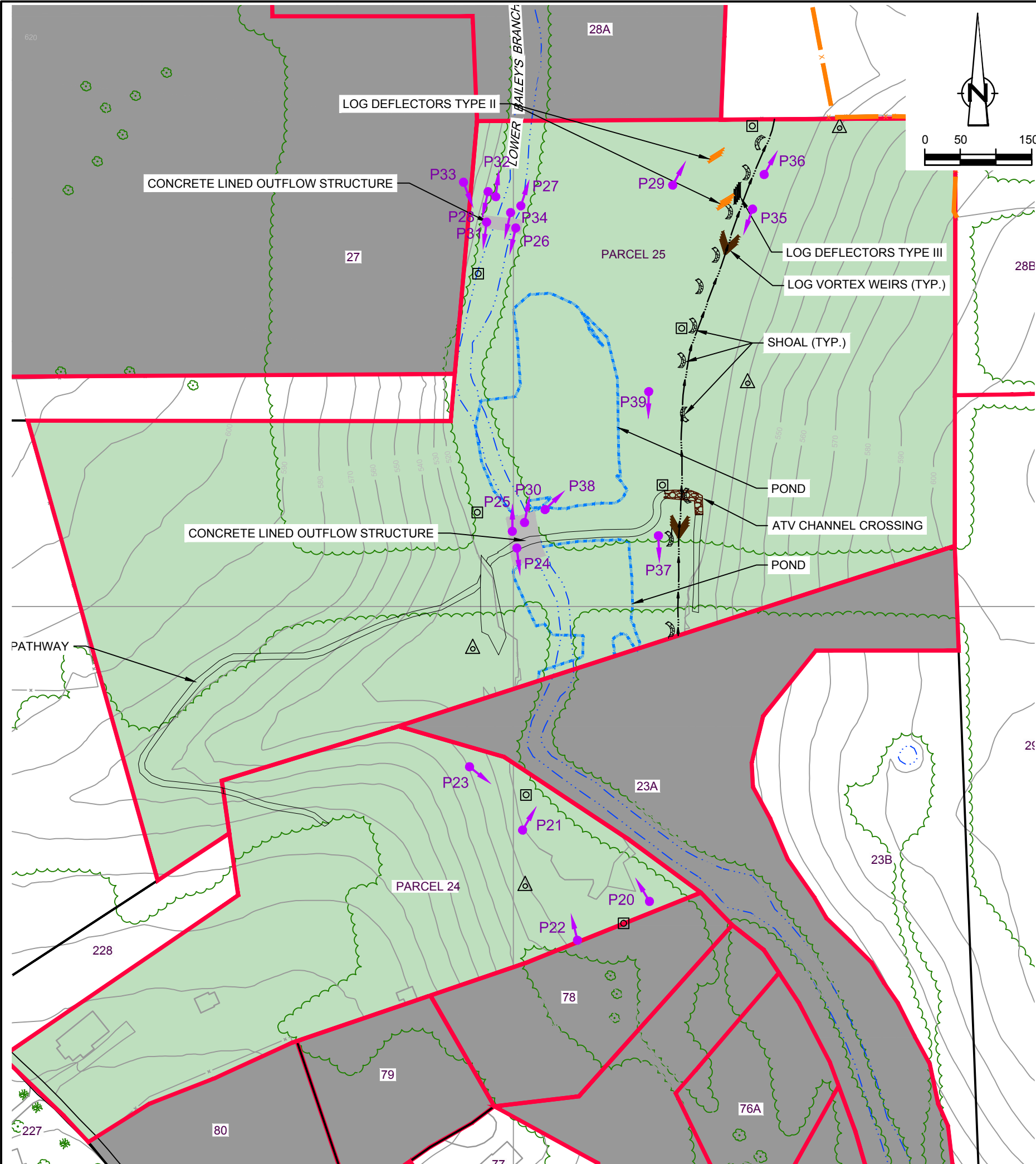
	APPROXIMATE DOWNSTREAM PARCEL BOUNDARY
	GM LLC FACILITY
	PARCELS WHICH ARE OWNED BY GM LLC
	PARCELS WHICH ARE THIRD-PARTY OWNED OFF-SITE PROPERTIES (PROPERTIES NEVER OWNED BY GMC)
	PROPERTIES SOLD BY GMC PRIOR TO BANKRUPTCY OR RETAINED BY MLC FOLLOWING GMC BANKRUPTCY (MANAGED BY RACER TRUST)

## Appendix A

# PHOTOGRAPHIC LOG KEY PARCELS 15, 21, AND 216 DOWNSTREAM PARCELS MONITORING AND MAINTENANCE GM CET BEDFORD FACILITY *Bedford, Indiana*







SOURCE: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI.  
APRIL 2001 AND CRA SURVEYS 2002 TO 2005

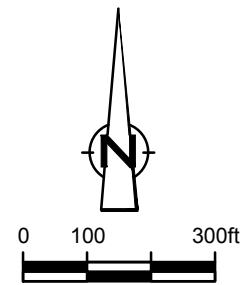
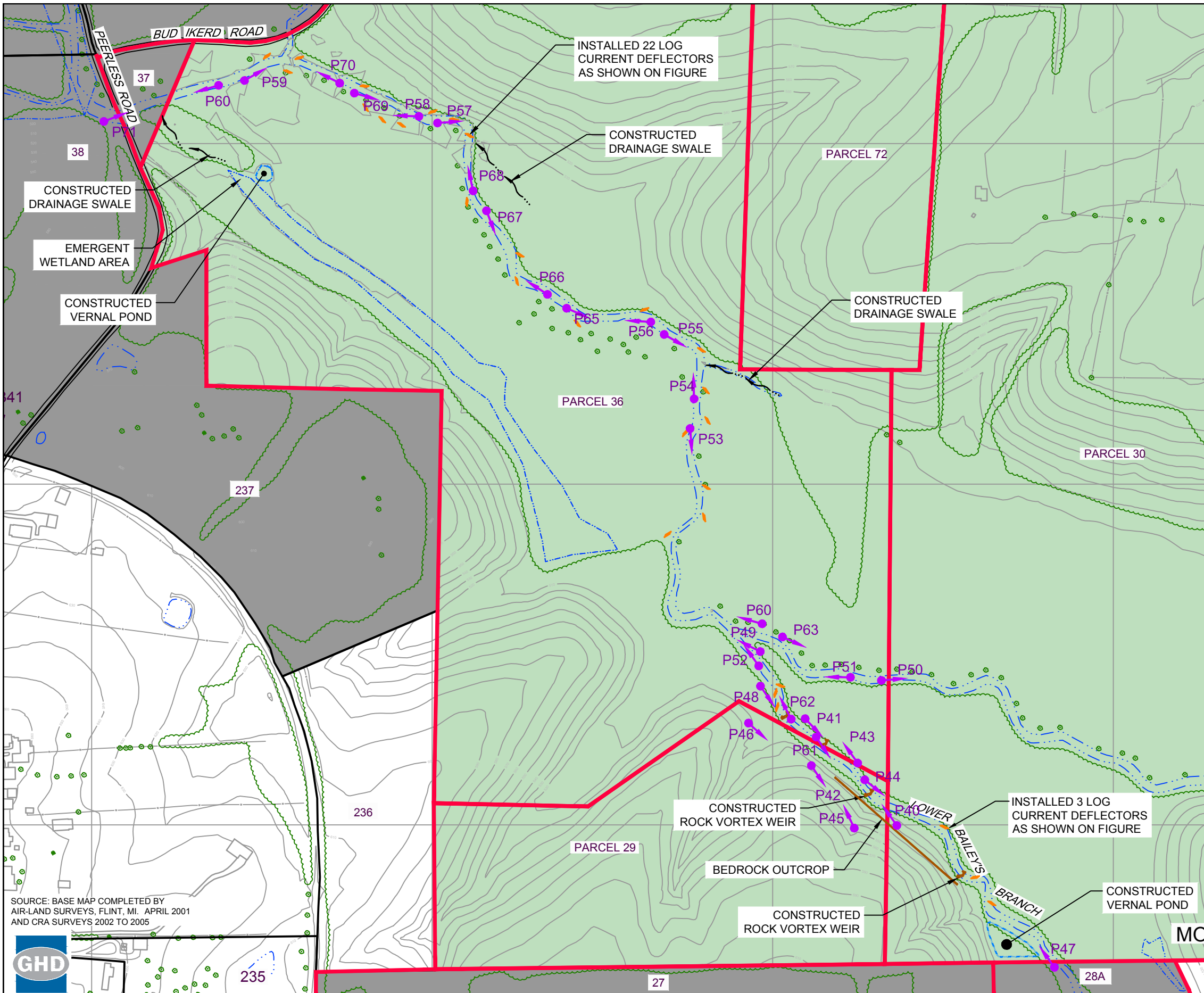
NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED  
FROM THE LAWRENCE COUNTY SURVEY PLATS.  
LOCATIONS MAY NOT ACCURATELY REPRESENT THE  
TRUE BOUNDARIES

LEGEND	
	EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
	EXISTING VEGETATION
	EXISTING BUILDINGS
	FENCE LINE
	RAILROAD TRACKS
	DIRT ROADS
	ROADS / PAVED AREAS
	NEW FENCE
	DIRECTION OF VIEW AND NUMBER OF PHOTOGRAPH TAKEN
	CREEK CENTER LINE
	APPROXIMATE SURFACE WATER LOCATION
	APPROXIMATE PARCEL BOUNDARY
	APPROXIMATE DOWNSTREAM PARCEL BOUNDARY
	PARCELS WHICH ARE THIRD-PARTY OWNED OFF-SITE PROPERTIES (PROPERTIES NEVER OWNED BY GMC)
	PROPERTIES SOLD BY GMC PRIOR TO BANKRUPTCY OR RETAINED BY MLC FOLLOWING GMC BANKRUPTCY (MANAGED BY RACER TRUST)

Appendix A

PHOTOGRAPHIC LOG KEY PARCELS 24 AND 25  
DOWNSTREAM PARCELS MONITORING AND MAINTENANCE  
GM CET BEDFORD FACILITY  
*Bedford, Indiana*





#### LEGEND

- EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
- EXISTING VEGETATION
- EXISTING BUILDINGS
- FENCE LINE
- DIRT ROADS
- ROADS / PAVED AREAS
- APPROXIMATE SURFACE WATER LOCATION
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE DOWNSTREAM PARCEL BOUNDARY
- ROCK VORTEX WEIR
- LOG CURRENT DEFLECTOR
- PARCELS WHICH ARE THIRD-PARTY OWNED OFF-SITE PROPERTIES (PROPERTIES NEVER OWNED BY GMC)
- PROPERTIES SOLD BY GMC PRIOR TO BANKRUPTCY OR RETAINED BY MLC FOLLOWING GMC BANKRUPTCY (MANAGED BY RACER TRUST)
- P05 DIRECTION OF VIEW AND NUMBER OF PHOTOGRAPH TAKEN

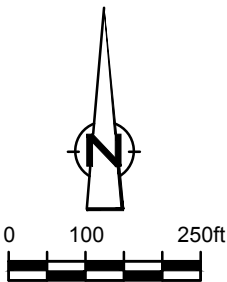
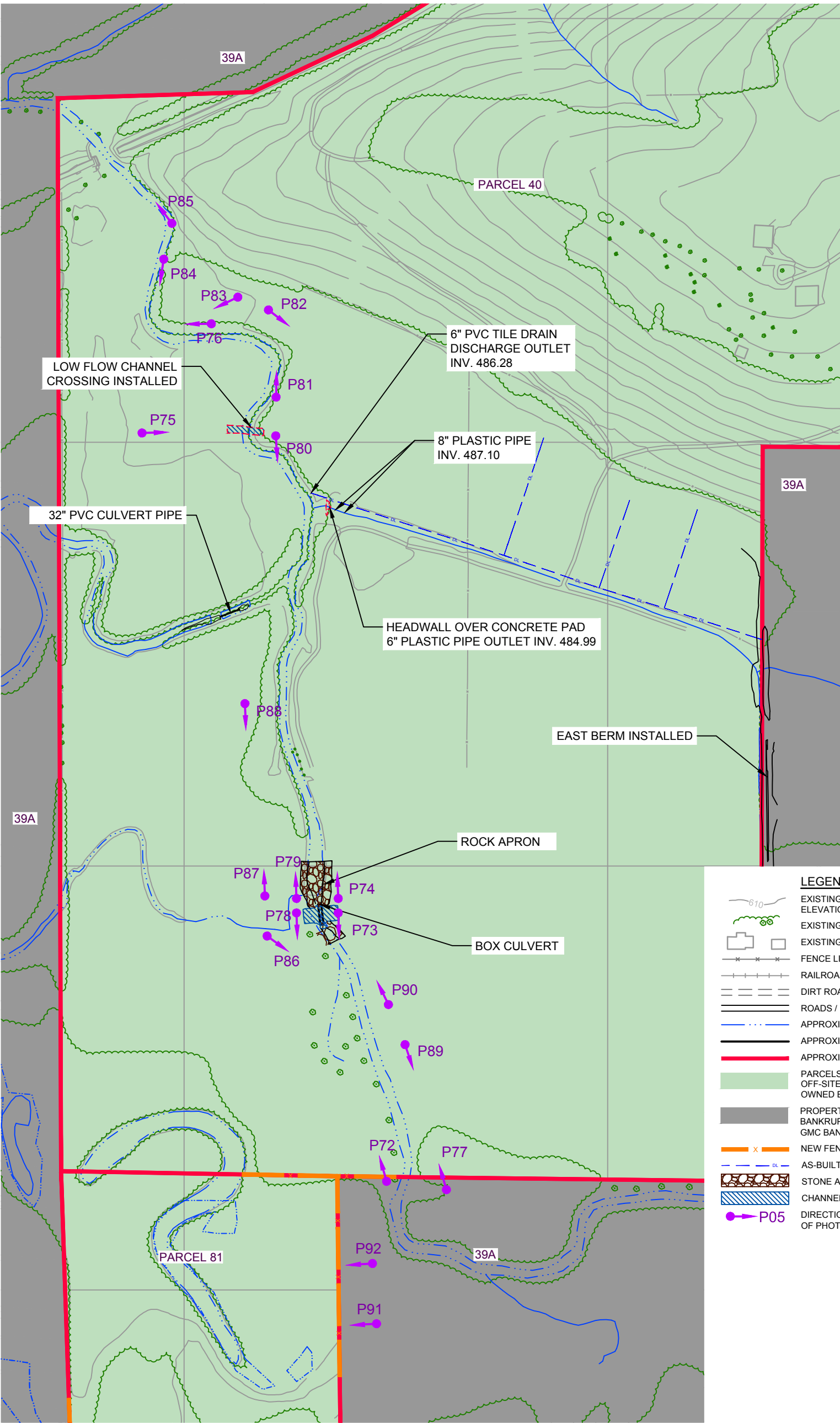
NOTE:  
PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES

SOURCE: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI. APRIL 2001 AND CRA SURVEYS 2002 TO 2005



## Appendix A PHOTOGRAPHIC LOG KEY PARCELS 29, 30, 36, AND 72 DOWNSTREAM PARCELS MONITORING AND MAINTENANCE GM CET BEDFORD FACILITY *Bedford, Indiana*





- LEGEND**
- EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
  - EXISTING VEGETATION
  - EXISTING BUILDINGS
  - FENCE LINE
  - RAILROAD TRACKS
  - DIRT ROADS
  - ROADS / PAVED AREAS
  - APPROXIMATE SURFACE WATER LOCATION
  - APPROXIMATE PARCEL BOUNDARY
  - APPROXIMATE DOWNSTREAM PARCEL BOUNDARY
  - PARCELS WHICH ARE THIRD-PARTY OWNED OFF-SITE PROPERTIES (PROPERTIES NEVER OWNED BY GMC)
  - PROPERTIES SOLD BY GMC PRIOR TO BANKRUPTCY OR RETAINED BY MLC FOLLOWING GMC BANKRUPTCY (MANAGED BY RACER TRUST)
  - NEW FENCE
  - AS-BUILT DRAIN TILE
  - STONE AND AGGREGATE FILL
  - CHANNEL CROSSING
  - DIRECTION OF VIEW AND NUMBER OF PHOTOGRAPH TAKEN

Appendix A

PHOTOGRAPHIC LOG KEY PARCELS 40 AND 81  
DOWNSTREAM PARCELS MONITORING AND MAINTENANCE  
GM CET BEDFORD FACILITY  
*Bedford, Indiana*

SOURCE: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI.  
APRIL 2001 AND CRA SURVEYS 2002 TO 2005



NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED  
FROM THE LAWRENCE COUNTY SURVEY PLATS.  
LOCATIONS MAY NOT ACCURATELY REPRESENT THE  
TRUE BOUNDARIES



Photo 1 – Tributary 3 on Parcels 15/216 - May 27, 2015



Photo 2 – Tributary 3 on Parcel 15 - May 27, 2015



## Site Photographs





Photo 3 – Tributary 3 on Parcels 15/216– September 16, 2015



Photo 4 – Vegetation Cover on Parcels 15/216 – September 16, 2015



## Site Photographs





Photo 5 – Tributary 3 on Parcels 15/216 – September 16, 2015



Photo 6 - Tributary 3 on Parcels 15/216 – September 16, 2015



## Site Photographs





Photo 7- Tributary 3 on Parcels 15/216 – September 16, 2015



Photo 8 - Bailey's Branch on Parcel 15 – May 27, 2015



## Site Photographs





Photo 9 - Bailey's Branch on Parcel 15 – May 27, 2015



Photo 10 - Bailey's Branch on Parcels 15/216 - May 27, 2015



## Site Photographs





Photo 11 - Bailey's Branch on Parcel 21 - May 27, 2015



Photo 12 - Bailey's Branch on Parcel 21 – May 27, 2015



## Site Photographs





Photo 13 - Vegetation Coverage on Parcel 21 – May 27, 2015



Photo 14 - Bailey's Branch on Parcel 15 – September 16, 2015



## Site Photographs





Photo 15 - Bailey's Branch on Parcels 15/216 – September 16, 2015



Photo 16 - Permanent Pond on Bailey's Branch on Parcel 216 – September 16, 2015



## Site Photographs





Photo 17 - Bailey's Branch on Parcel 15 – September 16, 2015



Photo 18 - Bailey's Branch on Parcel 15 – September 16, 2015



## Site Photographs



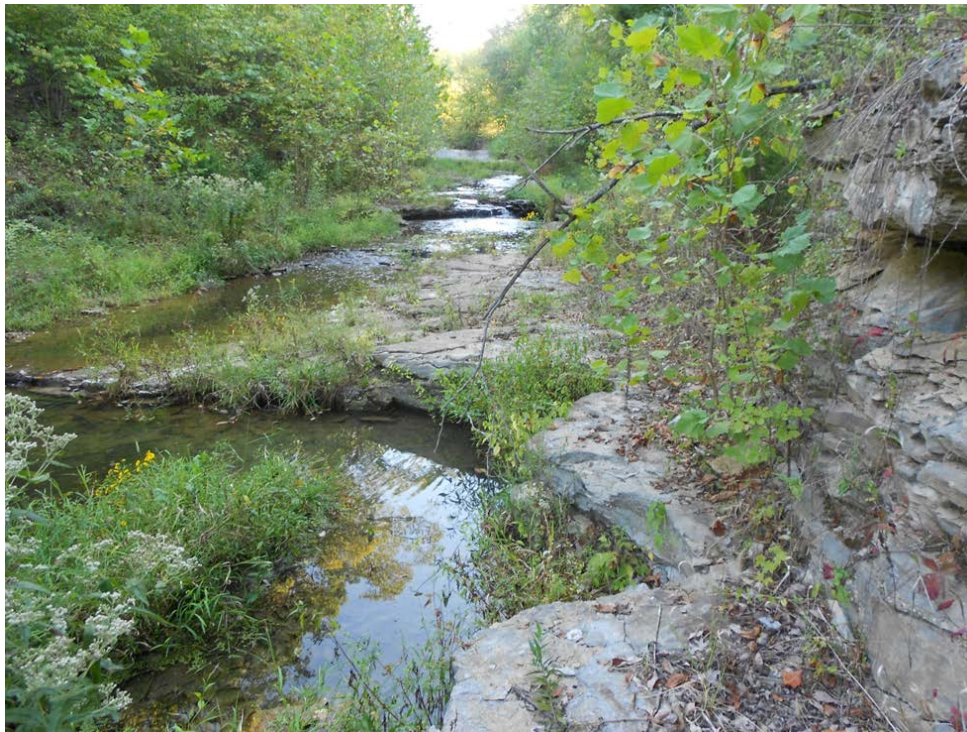


Photo 19 - Bailey's Branch on Parcel 21 – September 16, 2015



Photo 20 - Vegetation Cover on Parcel 24 – May 27, 2015



## Site Photographs





Photo 21 - Vegetation Cover on Parcel 24 – May 27, 2015



Photo 22 - Vegetation Cover on Parcel 24 – September 17, 2015



## Site Photographs





Photo 23 - Vegetation Cover on Parcel 24 – September 17, 2015



Photo 24 - Bailey's Branch on Parcel 25 – May 27, 2015



## Site Photographs





Photo 25 - Bailey's Branch on Parcel 25 – May 27, 2015



Photo 26 - Bailey's Branch on Parcel 25 – May 27, 2015



## Site Photographs





Photo 27 - Bailey's Branch on Parcel 25 – May 27, 2015



Photo 28 - Upstream Water Control Structure on Parcel 25 – May 27, 2015







Photo 29 - Vegetative Cover on Parcel 25 – May 27, 2015



Photo 30 - Bailey's Branch on Parcel 25 – September 17, 2015



## Site Photographs





Photo 31 - Bailey's Branch on Parcel 25 – September 17, 2015



Photo 32 - Bailey's Branch on Parcel 25 – September 17, 2015



## Site Photographs





Photo 33 - Upstream Water Control Structure on Parcel 25 – September 17, 2015



Photo 34 - Water Control Structure on Parcel 25 – September 17, 2015





Photo 35 - Former Diversion Channel on Parcel 25 – September 17, 2015



Photo 36 - Former Diversion Channel on Parcel 25 – September 17, 2015



## Site Photographs





Photo 37 - Former Diversion Channel on Parcel 25 – September 17, 2015



Photo 38 - Vegetation Cover on Parcel 25 – September 17, 2015



## Site Photographs





Photo 39 - Vegetation Cover on Parcel 25 – September 17, 2015



Photo 40 - Bailey's Branch on Parcel 29 – May 27, 2015



## Site Photographs





Photo 41 - Bailey's Branch on Parcel 29 – May 27, 2015



Photo 42 - Vegetation Cover on Parcel 29 – May 27, 2015



## Site Photographs





Photo 43 - Baily's Branch on Parcel 29 – September 17, 2015



Photo 44 - Bailey's Branch on Parcel 29 – September 17, 2015



## Site Photographs





Photo 45 - Vegetation Cover on Parcel 29 – September 17, 2015



Photo 46 - Vegetation Cover on Parcel 29 – September 17, 2015



## Site Photographs





Photo 47 - Bailey's Branch on Parcel 30 – May 27, 2015



Photo 48 - Bailey's Branch on Parcel 30 – September 17, 2015



## Site Photographs





Photo 49 - Bailey's Branch on Parcel 30 – September 17, 2015



Photo 50 - Pleasant Run on Parcel 36 – May 27, 2015



## Site Photographs





Photo 51 - Pleasant Run on Parcel 36 – May 27, 2015



Photo 52 - Confluence of Pleasant Run and Bailey's Branch on Parcel 36 – May 27, 2015



## Site Photographs





Photo 53 - Pleasant Run on Parcel 36 – May 27, 2015



Photo 54 - Pleasant Run on Parcel 36 – May 27, 2015



## Site Photographs





Photo 55 - Pleasant Run on Parcel 36 – May 27, 2015



Photo 56 - Pleasant Run on Parcel 36 – May 27, 2015



## Site Photographs





Photo 57 - Pleasant Run on Parcel 36 – May 27, 2015



Photo 58 - Pleasant Run on Parcel 36 – May 27, 2015



## Site Photographs





Photo 59 - Pleasant Run on Parcel 36 at Peerless Road – May 27, 2015



Photo 60 - Pleasant Run on Parcel 36 at Peerless Road – May 27, 2015



## Site Photographs





Photo 61 - Bailey's Branch on Parcel 36 – September 17, 2015



Photo 62 - Bailey's Branch on Parcel 36 – September 17, 2015



## Site Photographs





Photo 63 - Pleasant Run on Parcel 36 – September 17, 2015



Photo 64 - Pleasant Run on Parcel 36 – September 17, 2015



## Site Photographs





Photo 65 - Pleasant Run on Parcel 36 – September 17, 2015



Photo 66 - Pleasant Run on Parcel 36 – September 17, 2015



## Site Photographs





Photo 67 - Pleasant Run on Parcel 36 – September 17, 2015



Photo 68 - Pleasant Run on Parcel 36 – September 17, 2015



## Site Photographs





Photo 69 - Pleasant Run Upstream of Peerless Road – September 17, 2015



Photo 70 - Pleasant Run Upstream of Peerless Road – September 17, 2015



## Site Photographs





Photo 71 - Pleasant Run at Peerless Road – September 17, 2015



Photo 72 - Pleasant Run on Parcel 40 – May 27, 2015



## Site Photographs





Photo 73 - Pleasant Run on Parcel 40 – May 27, 2015



## Site Photographs





Photo 74 - Pleasant Run on Parcel 40 – May 27, 2015



Photo 75 - Pleasant Run on Parcel 40 – May 27, 2015



## Site Photographs





Photo 76 - Pleasant Run on Parcel 40 – May 27, 2015



Photo 77 - Pleasant Run on Parcel 40



## Site Photographs





Photo 78 - Pleasant Run on Parcel 40 – September 17, 2015



Photo 79 - Pleasant Run on Parcel 40 – September 17, 2015



## Site Photographs





Photo 80 - Pleasant Run on Parcel 40 – September 17, 2015



Photo 81 - Pleasant Run on Parcel 40 – September 17, 2015



## Site Photographs





Photo 82 - Pleasant Run on Parcel 40 – September 17, 2015



Photo 83 - Pleasant Run on Parcel 40 – September 17, 2015



## Site Photographs





Photo 84 - Pleasant Run on Parcel 40 – September 17, 2015



Photo 85 - Pleasant Run on Parcel 40 – September 17, 2015



## Site Photographs





Photo 86 - Vegetation Cover on Parcel 40 – September 17, 2015



Photo 87 - Vegetation Cover on Parcel 40 – September 17, 2015



## Site Photographs





Photo 88 - Vegetation Cover on Parcel 40 – September 17, 2015



Photo 89 - Vegetation Cover on Parcel 40 – September 17, 2015



## Site Photographs





Photo 90 - Vegetation Cover on Parcel 40 – September 17, 2015



Photo 91 - Vegetation Cover on Parcel 81 – May 27, 2015



## Site Photographs





Photo 92 - Vegetation Cover on Parcel 81 – September 17, 2015



# Appendix B

## Vegetation Monitoring Forms



**Appendix B1**  
**Vegetation Monitoring Form - Parcels 15, 21, and 216**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

Page 1 of 2

<b>Inspector</b> <b>Date</b> <b>Parcels/Cover Type</b>	S. Jones <hr/> May 27, 2015 <hr/> Parcels 15, 21, and 216/Riparian <hr/>
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**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Arrowhead	<i>Sagittaria sp.</i>	2	Rare		X	X			X
Cinquefoil	<i>Potentilla sp.</i>	4	Common		X	X			X
Dogbane	<i>Apocynum</i>	4	Common		X	X			X
Goldenrod	<i>Solidago sp.</i>	5	Very Common		X	X			X
Jewelweed	<i>Impatiens capensis</i>	3	Rare/Common		X	X			X
Meadow Garlic	<i>Allium canadense</i>	3	Rare/Common		X	X			X
Meadow Parsnip	<i>Thaspium trifoliatum</i>	3	Rare/Common		X	X			X
Milkweed	<i>Ascleopias sp.</i>	3	Rare/Common		X	X			X
Red Clover	<i>Trifolium pratense</i>	4	Common		X	X			X
Vetch	<i>Vicia sp.</i>	4	Common		X	X			X
White Heath Aster	<i>Symphyotrichum ericoides</i>	4	Common		X	X			X
Brome	<i>Bromus sp.</i>	2	Rare		X	X			X
Orchardgrass	<i>Datylis sp.</i>	3	Rare/Common		X	X			X
Unidentified Grass 3	---	3	Rare/Common		X	X			X

**Percent Areal Coverage of Grasses and Forbs**

                    > 95%



**Appendix B1**  
**Vegetation Monitoring Form - Parcels 15, 21, and 216**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Multiflora Rose	<i>Rosa multiflora</i>		X	X			X
Sycamore	<i>Platanus occidentalis</i>		X	X			X
Tulip Poplar	<i>Liriodendron tulipifera</i>		X	X			X
Willow	<i>Salix sp.</i>		X	X			X

**Survival Class**                                      **Not Applicable**                                      ≤ 25%                                      26-50%                                      51-75%                                      > 75%

**Shrubs and Trees**

**III. WILDLIFE OBSERVED**  
 Numerous passerines



**Appendix B2**  
**Vegetation Monitoring Form - Parcels 15, 21, and 216**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

**Inspector**  
**Date**  
**Parcels/Cover Type**

S. Jones  
 September 16, 2015  
 Parcels 15, 21, and 216/Riparian

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Blue Mistflower	<i>Conoclinium coelestinum</i>	4	Common		X	X			X
Boneset	<i>Eupatorium perfoliatum</i>	4	Common		X	X			X
Canada Goldenrod	<i>Solidago canadensis</i>	6	Abundant		X	X			X
Canada Thistle	<i>Cirsium arvense</i>	3	Rare/Common		X	X			X
Catail	<i>Typha sp.</i>	4	Common		X	X			X
Common Ragweed	<i>Ambrosia artemisiifolia</i>	4	Common		X	X			X
Duckweed	<i>Lemna sp.</i>	3	Rare/Common		X	X			X
Forget-Me-Not	<i>Myosotis sp.</i>	3	Rare/Common		X	X			X
Great Blue Lobelia	<i>Lobelia siphilitica</i>	4	Common		X	X			X
Greater Burdock	<i>Arctium lappa</i>	3	Rare/Common		X	X			X
Honeysuckle	<i>Lonicera sp.</i>	3	Rare/Common		X	X			X
Horsetail	<i>Equisetum sp.</i>	4	Common		X	X			X
Jewelweed	<i>Impatiens capensis</i>	4	Common		X	X			X
Lurid Sedge	<i>Carex lurida</i>	4	Common		X	X			X
Milkweed	<i>Ascleopias sp.</i>	3	Rare/Common		X	X			X
Nodding Beggarticks	<i>Bidens cernua</i>	6	Abundant		X	X			X
Pennsylvania Smartweed	<i>Polygonum pennsylvanicum</i>	3	Rare/Common		X	X			X
Queen Anne's Lace	<i>Daucus carota</i>	4	Common		X	X			X
Red Clover	<i>Trifolium pratense</i>	3	Rare/Common		X	X			X



**Appendix B2**  
**Vegetation Monitoring Form - Parcels 15, 21, and 216**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

**I. GRASSES AND FORBS (continued)**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Smooth White Oldfield Aster	<i>Symphyotrichum racemosum</i>	4	Common		X	X			X
Snakeroot	<i>Eupatorium seratorium</i>	5	Very Common		X	X			X
Sneezeweed	<i>Helenium autumnale</i>	4	Common		X	X			X
Teasel	<i>Dipsacus sp.</i>	4	Common		X	X			X
Unidentified Forb 2	---	1	Observed		X	X			X
Unidentified Forb 3	---	1	Observed		X	X			X
Vetch	<i>Vicia sp.</i>	4	Common		X	X			X
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	3	Rare/Common		X	X			X
Watercress	<i>Nasturtium officinale</i>	2	Rare		X	X			X
White Heath Aster	<i>Symphyotrichum ericoides</i>	4	Common		X	X			X
Foxtail	<i>Alopercurus sp.</i>	2	Rare		X	X			X
Switchgrass	<i>Panicum virgatum</i>	3	Rare/Common		X	X			X
Indiangrass	<i>Sorghastrum nutans</i>	4	Common		X	X			X
Rice Cutgrass	<i>Leersia oryzoides</i>	3	Rare/Common		X	X			X
Unidentified Grass 2	---	3	Rare/Common		X	X			X

**Percent Areal Coverage of Grasses and Forbs**

> 95%

**Appendix B2**  
**Vegetation Monitoring Form - Parcels 15, 21, and 216**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Tulip Poplar	<i>Liriodendron tulipifera</i>		X	X			X
Sycamore	<i>Platanus occidentalis</i>		X	X			X
Willow	<i>Salix sp.</i>		X	X			X

<b>Survival Class</b>	<b>Not Applicable</b>	$\leq 25\%$	26-50%	51-75%	$> 75\%$
<b>Shrubs and Trees</b>					

**III. WILDLIFE OBSERVED**

Numerous passerines  
 Carcass of snapping turtle



**Appendix B3**  
**Vegetation Monitoring Form - Parcel 24**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

<b>Inspector</b>	S. Jones
<b>Date</b>	May 27, 2015
<b>Parcels/Cover Type</b>	Parcel 24/Forb Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Buttercup	<i>Ranunculus sp.</i>	2	Rare		X	X			X
Catail	<i>Typha sp.</i>	2	Rare		X	X			X
Compass Plant	<i>Silphium laciniatum</i>	3	Rare/Common	X			X		X
Daisy Fleabane	<i>Erigeron philadelphicus</i>	3	Rare/Common		X	X			X
False Aloe	<i>Manfreda virginica</i>	2	Rare		X	X			X
Forget-Me-Not	<i>Myosotis sp.</i>	3	Rare/Common		X	X			X
Goldenrod	<i>Solidago sp.</i>	3	Rare/Common	X			X		X
Greater Burdock	<i>Arctium lappa</i>	4	Common		X	X			X
Lurid Sedge	<i>Carex lurida</i>	2	Rare		X	X			X
Meadow Parsnip	<i>Thaspium trifoliatum</i>	3	Rare/Common		X	X			X
Milkweed	<i>Ascleopias sp.</i>	4	Common		X	X			X
Oxeye Daisy	<i>Leucanthemum vulgare</i>	3	Rare/Common		X	X			X
Plantain	<i>Plantago sp.</i>	3	Rare/Common		X	X			X
Queen Anne's Lace	<i>Daucus carota</i>	4	Common		X	X			X
Red Clover	<i>Trifolium pratense</i>	4	Common		X	X			X
Ticktrefoil	<i>Desmodium sp.</i>	2	Rare		X	X			X
Vetch	<i>Vicia sp.</i>	4	Common		X	X			X
White Heath Aster	<i>Symphyotrichum ericoides</i>	4	Common	X			X		X
White Mullein	<i>Verbascum sp.</i>	3	Rare/Common		X	X			X

**Appendix B3**  
**Vegetation Monitoring Form - Parcel 24**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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**I. GRASSES AND FORBS (continued)**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Wild Lettuce	<i>Lactuca sp.</i>	3	Rare/Common		X	X			X
Yellow Sweetclover	<i>Melilotus altissimus</i>	4	Common		X	X			X
Canadian Wild Rye	<i>Elymus canadensis</i>	4	Common	X			X		X
Threeawn	<i>Aristida sp.</i>	2	Rare		X	X			X
Bluestem	<i>Panicum sp.</i>	4	Common	X			X		X
Foxtail	<i>Alopercurus sp.</i>	3	Rare/Common		X	X			X

**Percent Areal Coverage of Grasses and Forbs**

> 95%

**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Multiflora Rose	<i>Rosa multiflora</i>		X	X			X
Sycamore	<i>Platanus occidentalis</i>		X	X			X

**Survival Class**  
**Shrubs and Trees**

**Not Applicable**

≤ 25%

26-50%

51-75%

> 75%

**III. WILDLIFE OBSERVED**

Numerous passerines



**Appendix B4**  
**Vegetation Monitoring Form - Parcel 24**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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<b>Inspector</b>	S. Jones
<b>Date</b>	September 17, 2015
<b>Parcels/Cover Type</b>	Parcel 24/Forb Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Boneset	<i>Eupatorium perfoliatum</i>	3	Rare/Common		X	X			X
Canada Goldenrod	<i>Solidago canadensis</i>	5	Very Common		X	X			X
Cat tail	<i>Typha sp.</i>	2	Rare		X	X			X
Common Ragweed	<i>Ambroia artemisiifolia</i>	3	Rare/Common		X	X			X
Compass Plant	<i>Silphium laciniatum</i>	4	Common	X			X		X
Crowned Beggarticks	<i>Bidens coronata</i>	2	Rare		X	X			X
Cup Plant	<i>Silphium perfoliatum</i>	4	Common	X			X		X
False Nettle	<i>Boehmeria sp.</i>	2	Rare		X	X			X
Great Blue Lobelia	<i>Lobelia siphilitica</i>	2	Rare		X	X			X
Jewelweed	<i>Impatiens capensis</i>	3	Rare/Common		X	X			X
Lurid Sedge	<i>Carex lurida</i>	2	Rare		X	X			X
New England Aster	<i>Symphyotrichum novae-angliae</i>	4	Common	X			X		X
Nodding Beggarticks	<i>Bidens cernua</i>	4	Common	X			X		X
Oxeye Daisy	<i>Leucanthemum vulgare</i>	4	Common		X	X			X
Queen Anne's Lace	<i>Daucus carota</i>	3	Rare/Common		X	X			X
Red Clover	<i>Trifolium pratense</i>	3	Rare/Common		X	X			X
Snakeroot	<i>Eupatorium seratorium</i>	3	Rare/Common		X	X			X
Sunflower	<i>Helianthus sp.</i>	3	Rare/Common		X	X			X
Vetch	<i>Vicia sp.</i>	3	Rare/Common		X	X			X

**Appendix B4**  
**Vegetation Monitoring Form - Parcel 24**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

Page 2 of 2

**I. GRASSES AND FORBS (continued)**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
White Heath Aster	<i>Symphyotrichum ericoides</i>	4	Common	X			X		X
Yellow Wingstem	<i>Vernonia alternifolia</i>	3	Rare/Common	X			X		X
Bluestem	<i>Panicum sp.</i>	4	Common	X			X		X
Canadian Wild Rye	<i>Elymus canadensis</i>	2	Rare	X			X		X
Foxtail	<i>Alopercurus sp.</i>	3	Rare/Common		X	X			X
Threeawn	<i>Aristida sp.</i>	4	Common		X	X			X

**Percent Areal Coverage of Grasses and Forbs**

> 95%

---

**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Multiflora Rose	<i>Rosa multiflora</i>		X	X			X
Sycamore	<i>Platanus occidentalis</i>		X	X			X

**Survival Class**  
**Shrubs and Trees**

**Not Applicable**

≤ 25%

26-50%

51-75%

> 75%

**III. WILDLIFE OBSERVED**

Numerous passerines



**Appendix B5**  
**Vegetation Monitoring Form - Parcel 25**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

<b>Inspector</b>	S. Jones
<b>Date</b>	May 27, 2015
<b>Parcels/Cover Type</b>	Parcel 25/Forb Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Lurid Sedge	<i>Carex lurida</i>	3	Rare/Common		X	X			X
Cocklebur	<i>Xanthium sp.</i>	3	Rare/Common		X	X			X
Vetch	<i>Vicia sp.</i>	4	Common		X	X			X
Red Clover	<i>Trifolium pratense</i>	4	Common		X	X			X
Compass Plant	<i>Silphium laciniatum</i>	3	Rare/Common	X			X		X
White Mullein	<i>Verbascum sp.</i>	3	Rare/Common		X	X			X
Yellow Sweetclover	<i>Melilotus altissimus</i>	3	Rare/Common		X	X			X
Greater Burdock	<i>Arctium lappa</i>	3	Rare/Common		X	X			X
Wild Lettuce	<i>Lactuca sp.</i>	3	Rare/Common		X	X			X
Milkweed	<i>Ascleopias sp.</i>	3	Rare/Common		X	X			X
False Aloe	<i>Manfreda virginica</i>	3	Rare/Common		X	X			X
Ticktrefoil	<i>Desmodium sp.</i>	3	Rare/Common		X	X			X
Goldenrod	<i>Solidago sp.</i>	5	Very Common	X			X		X
Meadow Parsnip	<i>Thaspium trifoliatum</i>	3	Rare/Common		X	X			X
Teasel	<i>Dipsacus sp.</i>	3	Rare/Common		X	X			X
Dogbane	<i>Apocynum</i>	3	Rare/Common		X	X			X
Aster	<i>Aster sp.</i>	5	Very Common	X					X
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>	3	Rare/Common	X			X		X
Beardtongue	<i>Penstemon sp.</i>	2	Rare		X	X			X

**Appendix B5**  
**Vegetation Monitoring Form - Parcel 25**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

**I. GRASSES AND FORBS (continued)**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Duckweed	<i>Lemna sp.</i>	1	Observed		X	X			X
Bluestem	<i>Panicum sp.</i>	3	Rare/Common	X			X		X
Canadian Wild Rye	<i>Elymus canadensis</i>	3	Rare/Common	X			X		X
Foxtail	<i>Alopercurus sp.</i>	3	Rare/Common		X	X			X
Indiangrass	<i>Sorghastrum nutans</i>	3	Rare/Common	X			X		X
Kentucky Bluegrass	<i>Poa patensis</i>	3	Rare/Common	X			X		X
Switchgrass	<i>Panicum virgatum</i>	3	Rare/Common	X			X		X
Threeawn	<i>Aristida sp.</i>	3	Rare/Common		X	X			X
Timothy	<i>Phleum pratense</i>	3	Rare/Common	X			X		X
Unidentified Grass 3	---	3	Rare/Common		X	X			X

**Percent Areal Coverage of Grasses and Forbs**

> 95%

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Appendix B5  
Vegetation Monitoring Form - Parcel 25  
May 2015  
Downstream Parcels Monitoring and Maintenance  
Bedford CET Facility

**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Aspen	<i>Populus sp.</i>		X	X			X
Elm	<i>Ulmus sp.</i>		X	X			X
Honey Locust	<i>Gleditsia tricacanthos</i>		X	X			X
Redbud	<i>Cercis canadensis</i>		X	X			X
Sycamore	<i>Platanus occidentalis</i>		X	X			X

**Survival Class**  
**Shrubs and Trees**

≤ 25%

26-50%

51-75%

> 75%

**III. WILDLIFE OBSERVED**

Numerous passerines  
Belted kingfisher  
Group of wild turkeys

**Appendix B6**  
**Vegetation Monitoring Form - Parcel 25**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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<b>Inspector</b>	S. Jones
<b>Date</b>	September 17, 2015
<b>Parcels/Cover Type</b>	Parcel 25/Forb Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Canada Goldenrod	<i>Solidago canadensis</i>	6	Abundant		X	X			X
Canada Thistle	<i>Cirsium arvense</i>	2	Rare		X	X			X
Common Ragweed	<i>Ambroia artemisiifolia</i>	3	Rare/Common		X	X			X
Compass Plant	<i>Silphium laciniatum</i>	4	Common	X			X		X
Crowned Beggarticks	<i>Bidens coronata</i>	4	Common		X	X			X
Cup Plant	<i>Silphium perfoliatum</i>	4	Common	X			X		X
Great Blue Lobelia	<i>Lobelia siphilitica</i>	3	Rare/Common	X			X		X
Greater Burdock	<i>Arctium lappa</i>	2	Rare		X	X			X
Jewelweed	<i>Impatiens capensis</i>	3	Rare/Common		X	X			X
Lurid Sedge	<i>Carex lurida</i>	1	Observed		X	X			X
Milkweed	<i>Ascleopias sp.</i>	3	Rare/Common		X	X			X
New England Aster	<i>Symphyotrichum novae-angliae</i>	4	Common	X			X		X
Nodding Beggarticks	<i>Bidens cernua</i>	4	Common	X			X		X
Primrose	<i>Oenothera sp.</i>	2	Rare		X	X			X
Queen Anne's Lace	<i>Daucus carota</i>	4	Common		X	X			X
Slender Goldenrod	<i>Euthamia galetorum</i>	2	Rare		X	X			X
Snakeroot	<i>Eupatorium seratorium</i>	3	Rare/Common		X	X			X
Tall Thoroughwort	<i>Eupatorium altissimum</i>	3	Rare/Common		X	X			X
Teasel	<i>Dipsacus sp.</i>	4	Common		X	X			X



**Appendix B6**  
**Vegetation Monitoring Form - Parcel 25**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Vetch	<i>Vicia sp.</i>	3	Rare/Common		X	X			X
Bluestem	<i>Panicum sp.</i>	3	Rare/Common	X			X		X
Canadian Wild Rye	<i>Elymus canadensis</i>	3	Rare/Common	X			X		X
Foxtail	<i>Alopercurus sp.</i>	3	Rare/Common		X	X			X
Indiangrass	<i>Sorghastrum nutans</i>	3	Rare/Common	X			X		X
Kentucky Bluegrass	<i>Poa patensis</i>	3	Rare/Common	X			X		X
Switchgrass	<i>Panicum virgatum</i>	3	Rare/Common	X			X		X
Threeawn	<i>Aristida sp.</i>	3	Rare/Common		X	X			X
Timothy	<i>Phleum pratense</i>	3	Rare/Common	X			X		X
Unidentified Grass 1	---	3	Rare/Common		X	X			X

**Percent Areal Coverage of Grasses and Forbs**

> 95%

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**Appendix B6**  
**Vegetation Monitoring Form - Parcel 25**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Aspen	<i>Populus sp.</i>		X	X			X
Elm	<i>Ulmus sp.</i>		X	X			X
Honey Locust	<i>Gleditsia tricacanthos</i>		X	X			X
Redbud	<i>Cercis canadensis</i>		X	X			X
Sycamore	<i>Platanus occidentalis</i>		X	X			X

**Survival Class**  
**Shrubs and Trees**

**≤ 25%**

26-50%

51-75%

> 75%

**III. WILDLIFE OBSERVED**

Numerous passerines



**Appendix B7**  
**Vegetation Monitoring Form - Parcel 29**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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<b>Inspector</b>	S. Jones
<b>Date</b>	May 27, 2015
<b>Parcels/Cover Type</b>	Parcel 29/Forb Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Canada Goldenrod	<i>Solidago canadensis</i>	4	Common		X	X			X
Cocklebur	<i>Xanthium sp.</i>	3	Rare/Common		X		X		X
Common Ragweed	<i>Ambroia artemisiifolia</i>	2	Rare		X		X		X
Crowned Beggarticks	<i>Bidens coronata</i>	4	Common		X	X			X
Lurid Sedge	<i>Carex lurida</i>	4	Common		X		X		X
New York Ironweed	<i>Vernonia noveboracensis</i>	1	Observed	X			X		X
Nodding Beggarticks	<i>Bidens cernua</i>	3	Rare/Common	X			X		X
Queen Anne's Lace	<i>Daucus carota</i>	3	Rare/Common		X	X			X
Snakeroot	<i>Eupatorium seratorium</i>	4	Common		X	X			X
White Heath Aster	<i>Symphyotrichum ericoides</i>	5	Very Common	X			X		X
Bluestem	<i>Panicum sp.</i>	4	Common	X			X		X
Foxtail	<i>Alopercurus sp.</i>	3	Rare/Common		X	X			X

**Percent Areal Coverage of Grasses and Forbs**

> 95%

**Appendix B7**  
**Vegetation Monitoring Form - Parcel 29**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Black Gum	<i>Nyssa sylvatica</i>	X					X
Oak	<i>Quercus sp.</i>	X					X
Tulip Poplar	<i>Liriodendron tulipifera</i>		X	X			X

**Survival Class**  
**Shrubs and Trees**

≤ 25%

**26-50%**

51-75%

> 75%

**III. WILDLIFE OBSERVED**

Numerous passerines



**Appendix B8**  
**Vegetation Monitoring Form - Parcel 29**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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<b>Inspector</b>	S. Jones
<b>Date</b>	September 17, 2015
<b>Parcels/Cover Type</b>	Parcel 29/Forb Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Canada Goldenrod	<i>Solidago canadensis</i>	4	Common		X	X			X
Cocklebur	<i>Xanthium sp.</i>	3	Rare/Common		X		X		X
Common Ragweed	<i>Ambroia artemisiifolia</i>	2	Rare		X		X		X
Crowned Beggarticks	<i>Bidens coronata</i>	4	Common		X	X			X
Lurid Sedge	<i>Carex lurida</i>	4	Common		X		X		X
New York Ironweed	<i>Vernonia noveboracensis</i>	1	Observed	X			X		X
Nodding Beggarticks	<i>Bidens cernua</i>	3	Rare/Common	X			X		X
Queen Anne's Lace	<i>Daucus carota</i>	3	Rare/Common		X	X			X
Snakeroot	<i>Eupatorium seratorium</i>	4	Common		X	X			X
White Heath Aster	<i>Symphyotrichum ericoides</i>	5	Very Common	X			X		X
Bluestem	<i>Panicum sp.</i>	4	Common	X			X		X
Foxtail	<i>Alopercurus sp.</i>	3	Rare/Common		X	X			X

**Percent Areal Coverage of Grasses and Forbs**

> 95%

**Appendix B8**  
**Vegetation Monitoring Form - Parcel 29**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Black Gum	<i>Nyssa sylvatica</i>	X					X
Shumard Oak	<i>Quercus shumardi</i>	X					X
Tulip Poplar	<i>Liriodendron tulipifera</i>		X	X			X

**Survival Class**  
**Shrubs and Trees**

≤ 25%

**26-50%**

51-75%

> 75%

**III. WILDLIFE OBSERVED**

Numerous passerines



**Appendix B9**  
**Vegetation Monitoring Form - Parcel 40**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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<b>Inspector</b>	S. Jones
<b>Date</b>	May 27, 2015
<b>Parcels/Cover Type</b>	Parcel 40/Forb Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Aster	<i>Aster sp.</i>	3	Rare/Common		X	X			X
Common Ragweed	<i>Ambroia artemisiifolia</i>	6	Abundant		X	X			X
Daisy Fleabane	<i>Erigeron philadelphicus</i>	4	Common		X	X			X
Dandelion	<i>Taraxacum officiale</i>	2	Rare		X	X			X
Field Bindweed	<i>Convolvulus arvensis</i>	2	Rare		X	X			X
Golden Ragwort	<i>Packera aurea</i>	4	Common		X	X			X
Goldenrod	<i>Solidago sp.</i>	4	Common	X			X		X
Plantain	<i>Plantago sp.</i>	2	Rare		X	X			X
Red Clover	<i>Trifolium pratense</i>	6	Abundant		X	X			X
Sunflower	<i>Helianthus sp.</i>	3	Rare/Common		X	X			X
White Mullein	<i>Verbascum sp.</i>	3	Rare/Common		X	X			X
Canadian Wild Rye	<i>Elymus canadensis</i>	4	Common	X			X		X
Fescue	<i>Festuca sp.</i>	3	Rare/Common	X			X		X
Foxtail	<i>Alopercurus sp.</i>	4	Common		X	X			X
Kentucky Bluegrass	<i>Poa patensis</i>	4	Common	X			X		X
Redtop	<i>Agrostis gigantea</i>	2	Rare	X			X		X

**Percent Areal Coverage of Grasses and Forbs**

85% - 90%

**Appendix B9**  
**Vegetation Monitoring Form - Parcel 40**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Aspen	<i>Populus tremuloides</i>		X	X			X
Bur Oak	<i>Quercus marcocarpa</i>	X					X
Honey Locust	<i>Gleditsia tricacanthos</i>		X	X			X
Maple	<i>Acer rubrum</i>	X					X
Red Oak	<i>Quercus rubra</i>	X					X
Willow	<i>Salix sp.</i>		X	X			X

**Survival Class**  
**Shrubs and Trees**

≤ 25%

26-50%

**51-75%**

> 75%

**III. WILDLIFE OBSERVED**

Numerous passerines



**Appendix B10**  
**Vegetation Monitoring Form - Parcel 40**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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<b>Inspector</b>	S. Jones
<b>Date</b>	September 17, 2015
<b>Parcels/Cover Type</b>	Parcel 40/Forb Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Blue Mistflower	<i>Conoclinium coelestinum</i>	4	Common		X	X			X
Canada Goldenrod	<i>Solidago canadensis</i>	4	Common		X	X			X
Cocklebur	<i>Xanthium sp.</i>	5	Very Common		X	X			X
Common Ragweed	<i>Ambroia artemisiifolia</i>	5	Very Common	X			X		X
Crowned Beggarticks	<i>Bidens coronata</i>	4	Common		X	X			X
Great Ragweed	<i>Ambroia trifida</i>	5	Very Common		X	X			X
New York Ironweed	<i>Vernonia noveboracensis</i>	1	Observed	X			X		X
Nodding Beggarticks	<i>Bidens cernua</i>	4	Common		X	X			X
Pennsylvania Smartweed	<i>Polygonum pensylvanicum</i>	4	Common		X	X			X
Slender Goldenrod	<i>Euthamia galetorum</i>	4	Common		X	X			X
Snakeroot	<i>Eupatorium seratorium</i>	5	Very Common		X	X			X
Canadian Wild Rye	<i>Elymus canadensis</i>	4	Common	X			X		X
Fescue	<i>Festuca sp.</i>	3	Rare/Common	X			X		X
Foxtail	<i>Alopercurus sp.</i>	4	Common		X	X			X
Kentucky Bluegrass	<i>Poa patensis</i>	4	Common	X			X		X
Redtop	<i>Agrostis gigantea</i>	2	Rare	X			X		X

**Percent Areal Coverage of Grasses and Forbs**

85% - 90%

Appendix B10  
Vegetation Monitoring Form - Parcel 40  
September 2015  
Downstream Parcels Monitoring and Maintenance  
Bedford CET Facility

**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Honey Locust	<i>Gleditsia tricacanthos</i>		X	X			X
Aspen	<i>Populus tremuloides</i>		X	X			X
Willow	<i>Salix sp.</i>		X	X			X
Red Oak	<i>Quercus rubra</i>	X			X		X
Bur Oak	<i>Quercus marcocarpa</i>	X			X		X
Red Maple	<i>Acer rubrum</i>	X			X		X

**Survival Class**  
**Shrubs and Trees**

≤ 25%      26-50%      **51-75%**      > 75%

**III. WILDLIFE OBSERVED**

Numerous passerines  
Deer tracks and scat



**Appendix B11**  
**Vegetation Monitoring Form - Parcel 81**  
**May 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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<b>Inspector</b>	S. Jones
<b>Date</b>	May 27, 2015
<b>Parcels/Cover Type</b>	Parcel 81/Grass Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Queen Anne's Lace	<i>Daucus carota</i>	4	Common		X	X			X
White Mullein	<i>Verbascum sp.</i>	2	Rare		X	X			X
Canadian Wild Rye	<i>Elymus canadensis</i>	3	Rare/Common	X			X		X
Kentucky Bluegrass	<i>Poa patensis</i>	5	Very Common	X			X		X
Timothy	<i>Phleum pratense</i>	2	Rare	X			X		X
Fescue	<i>Festuca sp.</i>	5	Very Common	X			X		X
Unidentified Grasses (mowed)		6	Abundant		X	X			X

**Percent Areal Coverage of Grasses and Forbs**

> 95%

**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Blue Spruce	<i>Picea pungens</i>	X			X		X

**Survival Class**

≤ 25%

26-50%

51-75%

**> 75%**

**Shrubs and Trees**

**III. WILDLIFE OBSERVED**

None

**Appendix B12**  
**Vegetation Monitoring Form - Parcel 81**  
**September 2015**  
**Downstream Parcels Monitoring and Maintenance**  
**Bedford CET Facility**

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<b>Inspector</b>	S. Jones
<b>Date</b>	September 17, 2015
<b>Parcels/Cover Type</b>	Grass Meadow

**I. GRASSES AND FORBS**

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Queen Anne's Lace	<i>Daucus carota</i>	4	Common		X	X			X
White Heath Aster	<i>Symphyotrichum ericoides</i>	4	Common	X			X		X
Threeawn	<i>Aristida sp.</i>	5	Very Common		X		X		X
Unidentified Grasses (mowed)		6	Abundant	X			X		X

**Percent Areal Coverage of Grasses and Forbs**

**> 95%**

**II. SHRUBS AND TREES**

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Blue Spruce	<i>Picea pungens</i>	X			X		X

**Survival Class**

≤ 25%

26-50%

51-75%

**> 75%**

**Shrubs and Trees**

**III. WILDLIFE OBSERVED**

None



[www.ghd.com](http://www.ghd.com)

