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Letter of Transmittal

To:	John R. Strang, P.E.	Date: 3/23/02	Job No.: 35629.00
	NYSDEC – Remedial Bureau A	Re:	Ft. Edward Landfill
	625 Broadway - 11th Floor		Work Assignment No. D003825-14.1
	Albany, New York 12233-7014		Site No. 5-58-001

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Project Manager

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FORT EDWARD LANDFILL

WETLAND EXPANSION AREA

2003 ANNUAL MONITORING REPORT

Prepared for:
URS Corporation
282 Delaware Avenue
Buffalo, New York 14202

Prepared by:
Delaware Engineering, P.C.
28 Madison Avenue Extension
Albany, New York 12203

December 2003

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APPENDICES

1.0 INTRODUCTION

This report represents the 2003 annual wetland expansion monitoring report for the Fort Edward Landfill Inactive Hazardous Waste Site located in the Town of Fort Edward, Washington County, New York. The report includes the annual vegetation monitoring conducted on September 1, 2003 and the bi-monthly (twice a month) water level monitoring data. The site location is depicted in Figure 1.

Delaware Engineering, P.C. (Delaware), on behalf of URS Corporation as part of their Superfund Standby Contract with the New York State Department of Environmental Conservation, initiated the 2003 wetland expansion area monitoring at the above referenced site on July 17, 2003. The monitoring was implemented following the requirements of Special Condition F of the U.S. Army Corps of Engineers (ACOE) Nationwide 38 Permit (Permit No. 95-05610-YN) for the Site and the URS wetland expansion monitoring plan.

2.0 STAFF GAGE AND SHALLOW MONITORING WELL INSTALLATION, MONITORING AND WETLAND HYDROLOGY CRITERIA

2.1 Staff Gage and Monitoring Well Installation and Monitoring

In July 1999 one staff gauge and one shallow monitoring well were installed in each of the three primary wetland expansion areas (expansion Area B, expansion Area D and expansion Area E). In August 2001, the monitoring well in expansion Area B was relocated. The relocation was necessary due to the regrading performed in the spring of 2000 to increase the size of the constructed wetland. The location of the wetland expansion areas and the approximate location of the staff gauges and shallow monitoring wells are depicted in Figure 2 (Map Pocket).

The shallow monitoring wells were installed following the ACOE, WRP Technical Note HY-1A-3.1, Installing Monitoring Wells/Piezometers in Wetlands, August 1993. The ACOE Technical Note HY-1A-3.1 states that two foot deep shallow monitoring wells may be used to determine when the shallow free-water surface is within depths required by wetland definitions and therefore can be used for wetland jurisdictional determinations.

The shallow monitoring wells installed in the Fort Edward Landfill wetland expansion areas were constructed of schedule 40 PVC. A three-inch diameter auger was used to create a thirty-inch deep auger hole. Approximately four to six inches of grade #0 sand was tamped into the bottom of the auger hole. An eighteen-inch length of 0.01 inch slotted PVC screen connected to solid PVC riser and a well point was inserted into the auger hole and into the sand. A sand pack was constructed by placing sand into the auger hole around the length of the screened interval and tamping the sand in place. A three-inch layer of bentonite chips was placed on top of the sand pack and wetted with water. A grout seal was placed from the top of the bentonite seal to the ground surface. A vented cap was placed on top of each shallow monitoring well.

A surface water staff gauge was installed in each of the primary wetland expansion areas at what appeared to be the deepest part of a pool. The staff gauges consisted of seven-foot steel fence

posts that were driven three to four feet into the ground. A steel measuring stick was attached to each fence post so that one end of the measuring stick was on the ground surface.

A discussion of the wetland expansion area shallow monitoring well and staff gage data are provided in Sections 4.0, 5.0 and 6.0 for wetland expansion areas B, D and E, respectively.

2.2 ACOE Wetland Hydrology Criteria

The shallow monitoring well and staff gage monitoring was implemented to document that the expansion areas meet the ACOE wetland hydrology criteria. The ACOE defines the wetland hydrology criteria as areas that are inundated or have soils that are saturated to the surface for sufficient duration during the growing season to develop hydric soils and support vegetation typically adapted for life in periodically anaerobic soil conditions.

The ACOE delineation manual states that for soil saturation to impact vegetation, it must occur within a major portion of the root zone (usually within 12 inches of the surface) of the prevalent vegetation. The major portion of the root zone is that portion of the soil profile in which more than one half of the plant roots occur. The depth of saturated soils is visually determined by digging a test pit to a depth of 16 inches and observing the level at which water stands in the hole after sufficient time has been allowed for water to drain into the hole. This level represents the depth to the water table. The depth to saturated soils will always be nearer the surface due to the capillary fringe.

The 1987 ACOE wetland delineation manual states that "an area has wetland hydrology if it is inundated or saturated to the surface continuously for at least 5% of the growing season in most years (50% probability of recurrence). These areas are wetlands if they also meet hydrophytic vegetation and hydric soil requirements." The ACOE manual states that the growing season "can be approximated by the number of frost-free days." and "estimated starting and ending dates for the growing season are based on 28 degree (F) air temperature thresholds at a frequency of 5 years in 10." For the Fort Edward Landfill the length of the growing season is approximately 165 days, based on temperature data from Saratoga Springs (Natural Resource Conservation Service 1961-1990) and occurs from April 26 to October 8. Therefore, soils that are saturated to the surface or inundated for eight or more consecutive days between April 26 and October 8 would meet the ACOE wetland hydrology criteria.

3.0 WETLAND PLANT COMMUNITY MONITORING

Plant community monitoring was performed in each of the three primary wetland expansion areas. The plant communities present in each of the wetland expansion areas was either wet meadow or emergent wetland. Monitoring consisted of an evaluation of vegetative cover and photo documentation of wetland conditions. The vegetation monitoring and photo documentation for the 2003 monitoring period was performed on September 1, 2003. A discussion of the plant community monitoring for the three primary wetland expansion areas, Areas B, D and E is provided in sections 4.0, 5.0 and 6.0, respectively.

Special condition F of the ACOE permit stated that "all plant species, along with their estimated relative frequency and percent cover, shall be identified using plots measuring 10 feet by 10 feet, with at least one representative plot located in each of the habitat types". Relative frequency cannot be determined using a single vegetation plot, therefore, four vegetation plots were located in wetland expansion areas D and E and three plots were located in wetland expansion area B. Also, an overall estimate of vegetative cover for the entire wetland area was performed.

Vegetation plots were located using a stratified random procedure. Using the base map provided by Kubricky Construction (New Wetland Boundary Map, 1/28/99) a numbered grid was placed over each of the three main wetland expansion areas. A random numbers generator was used to select four numbers for wetland expansion Areas D and E and three numbers for expansion Area B. In each of the wetland expansion areas, the grid number corresponding to the randomly selected number determined the vegetation plot location. The vegetation plots were located in the field using three-foot metal fence posts. The axis of the plots was laid in cardinal directions with the fence post representing the southwest corner of the vegetation plot. The approximate location of the vegetation plots is provided in Figure 2.0

Within each 100 square foot vegetation plot, the total vegetative percent cover of the plot was estimated. For each plant species, the percent cover was classified according to a modified Braun-Blanquet Cover Class System and a percentage estimate of the percent cover was also made. The modified Braun-Blanquet (B-B) Cover Class System is provided in Table 1.

In the herbaceous layer individual plants were counted using the following procedure:

- Forbs: Individual stems, cover was not estimated for individual stems, but rather for all individuals in the plot.
- Clump forming graminoids: Individual Clumps
- Sod forming graminoids: Each patch up to six square inches. Larger patches counted as the number of six-inch square equivalent patches making up the larger patch.

TABLE 1

Modified Braun-Blanquet Cover Class Ranges [1]

Class Contribution to Total Cover		
Cover Class	**Range, in %**	**Mean, in %**
5	75 to 100	87.5
4	50 to <75	62.5
3	25 to <50	37.5
2	5 to <25	15
1	1 to <5	3
+	<1	0.5
R	Observed but so rare as to not measurably contribute	

The relative frequency of each plant species was estimated for each wetland expansion area. The relative frequency was calculated using the following formula:

$$Rfi = fi / \hat{}fi$$

Where:
Rfi is the relative frequency of species i
fi is the number of plots in which the species was identified
^fi is the total number of plots sampled

Using the data from the vegetation plots, the relative percent coverage of each plant species was estimated for each wetland expansion area using the modified Braun-Blanquet cover classifications. The relative percent coverage was calculated using the following formula:

$$RCi = Ci / \hat{}Ci$$

Where:
Rci is the relative coverage of species i
Ci is the total of the species i modified B-B system values (i.e., 1 through 5)
^Ci is the total of all species modified B-B system values

Field data sheets for each of the vegetation plots are provided in Appendix A. The field data sheets provide the common and scientific name, the wetland indicator status the Braun-Blanquet cover class; the estimated percent cover (vegetative percent cover over entire wetland) and the number of individuals.

Table 2, provides the common and scientific name, the wetland indicator category, overall percent vegetative cover of the entire wetland, the Braun-Blanquet cover value, the relative percent cover and the relative percent frequency of each plant species for wetland expansion Areas B, D and E.

The wetland indicator category is an estimated probability (likelihood) of a species occurring in wetlands versus non-wetlands. A positive (+) or negative (-) sign is used with the Facultative Indicator categories to more specifically define the frequency of occurrence in wetlands. The positive sign indicates a frequency toward the higher end of the category (more frequently found in wetlands), and a negative sign indicates a frequency toward the lower end of the category (less frequently found in wetlands). An asterisk (*) following a regional Indicator identifies tentative assignments based on limited information from which to determine the indicator status. The wetland indicators or described below:

- Obligate Wetland (OBL): Occur almost always (estimated probability >99%) under natural conditions in wetlands.

- Facultative Wetland (FACW). Usually occur in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.

- Facultative (FAC). Equally likely to occur in wetlands or non wetlands (estimated probability 34%-66%).

- Facultative Upland (FACU). Usually occur in non-wetlands (estimated probability 67%-99%), but occasionally found on wetlands (estimated probability 1%-33%).

Obligate Upland (UPL). Occur in wetlands in another region, but occur almost always (estimated probability >99%) under natural conditions in non-wetlands.

At least one permanent photo station was established in each of the wetland expansion areas. Steel fence posts were used to mark the location of the photo stations in the field. Two photo stations were established in wetland expansion Areas D and E and one photo station was established in wetland expansion Area B. The approximate locations of the photo stations are provided on Figure 2 (Map Pocket). Photographs are provided on Figure 3 (Map Pocket).

4.0 WETLAND EXPANSION AREA B

Wetland expansion Area B is located on the south side of the landfill. This wetland is located adjacent to an existing wetland, which borders expansion Area B on the south, east and west. The north boundary of the expansion area is the landfill access road.

4.1 Wetland Expansion Area B Plant Community Monitoring

Table 2 summarizes the plant species identified in the three vegetation plots established in expansion Area B and the overall percent vegetative cover for Area B. Field data sheets presenting the percent cover of each plant species in the vegetative plots are provided in Appendix A. Photograph depicting the wetland conditions (as of September 1, 2003) are provided in Appendix B.

Based on the relative percent cover data, the relative frequency data and visual evaluation of the entire wetland area, the three dominant plant species in expansion Area B are rice cut grass (Leersia oryzoides), fragrant goldenrod (Euthamina graminifolia) and jewelweed (Impatiens carpensis). Pursuant to the scope of work, naming the three overall dominant plant species identifies the plant community types in each expansion area. Therefore, the plant community type in expansion Area B is a Leersia oryzoides – Euthamina graminifolia - Impatiens carpensis community. The wetland vegetation in expansion Area B appears to be healthy and thriving.

The U.S. Fish and Wildlife Service wetland indicator category for rice cut grass is OBL, the wetland indicator category for jewelweed is FACW and the indicator category for fragrant goldenrod is FAC. Therefore, the vegetation in wetland expansion Area B meets the USACOE wetland vegetation criteria, since greater than fifty-percent of the species are FAC or wetter.

4.2 Wetland Expansion Area B Water Level Elevation Data

Shallow monitoring well and staff gage water level elevation data for Area B are provided in Table 3. For the year 2003 monitoring period, the shallow monitoring well water levels and staff gage water elevations were measured bi-monthly beginning on July 17, 2003 and continued through November 2003.

From July through November 2003 the staff gage data indicates that there were two dates in November where wetland expansion Area B had standing water at the staff gage location. Wetland expansion Area B was often saturated to the surface in many areas within the perimeter of the expansion area, including the area near the staff gage. The saturated conditions observed at the staff gage and in other areas, indicate that wetland expansion Area B was most likely inundated for eight consecutive days within the growing season. The observations indicate that wetland expansion Area B meets the ACOE hydrology criteria.

The shallow monitoring well data indicate that the shallow water table was within 12 inches of the surface during the growing season. Figure 3 graphically depicts wetland expansion Area B ground water level data. The presence of saturated conditions within 12 inches of the surface near the perimeter of wetland expansion Area B for over 8 consecutive days indicates that the area does meet the ACOE wetland hydrology criteria.

The hydrology source for wetland expansion Area B and the existing adjacent wetland appears to be precipitation runoff from west of the landfill. The eastern part of the existing wetland also receives water via precipitation runoff from the southern section of the landfill cap.

5.0 WETLAND EXPANSION AREA D

Wetland expansion Area D is located east of the landfill, and south of wetland treatment Cell 1. The eastern boundary of expansion Area D is the landfill access road. Expansion Area D is shaped like a horseshoe around an existing wetland, with the open end of the horseshoe facing west. Four vegetation plots and two photo stations were established in expansion Area D.

The general contractor for the site, Kubricky Construction, provided a survey map (Sheet 1, New Wetland Boundary, January 28, 1999) which delineated the outer boundary of each of the wetland expansion areas. This map indicated that wetland expansion Area D was 1.014 acres. However, this acreage estimate included part of the pre-existing wetland. The actual acreage of constructed wetland is approximately 0.66 acres, all of which meets the ACOE wetland criteria.

5.1 Wetland Expansion Area D Plant Community Monitoring

Table 2 summarizes the plant species identified in the four vegetation plots established in expansion Area D and the overall percent vegetative cover for Area D. Field data sheets presenting the percent cover of each plant species in the vegetative plots are provided in Appendix A. Photographs depicting the wetland conditions (as of September 1, 2003) are provided in Appendix B.

All of wetland mitigation Area D exhibits the vegetative characteristics of an ACOE jurisdictional wetland and the vegetation appears to be thriving and healthy. The wetland indicator category for the dominant vegetation in the four vegetative plots was OBL. Based on the relative percent cover and the relative frequency data for the vegetation plots and visual evaluation of the entire wetland expansion area, the dominant plant species in expansion Area D are cattail (Typha latifolia) and rice cut grass (Leersia oryzoides). Arrowhead (Sagittaria latifolia) and bur-reed (Sparganium eurycarpum) were also significantly represented. The wetland area D plant community in expansion Area D is a Typha latifolia – Leersia oryzoides plant community.

5.2 Wetland Expansion Area D Water Level Elevation Data

Shallow monitoring well and staff gage water level elevation data are provided in Table 4. The shallow monitoring well water levels and staff gage water elevations were measured bi-monthly beginning on July 17, 2003 and continued through November 2003.

The wetland expansion Area D staff gage water level data indicate that the area in the vicinity of the staff gage was inundated for over eight consecutive days during the growing season. The data indicate that this area of wetland expansion Area D meets the ACOE wetland hydrology criteria.

The shallow monitoring well ground water elevation data are depicted graphically in Figure 4 and are summarized in Table 4. The data indicate that the ground water levels were within twelve inches of the ground surface for eight consecutive days during the growing season. The shallow monitoring well data indicate that wetland expansion Area D meets the ACOE wetland hydrology criteria.

The staff gage and the shallow ground water monitoring well data indicate that the source of hydrology for wetland expansion Area D is a combination of ground water and surface water. The surface water source appears to be runoff from the capped landfill.

6.0 WETLAND EXPANSION AREA E

The survey map provided by Kubricky Construction depicted expansion Area E as 0.848 acres; however, this included the pre-existing wetland associated with the drainage feature. The approximate actual acreage of the wetland expansion area is 0.7 acres of which approximately 0.52 acres meets the ACOE wetland criteria

Expansion Area E is located south of treatment Cell 3 and east and south of the pre-treatment building. There is also a sub-area located south of the main body of expansion Area E. Four vegetation plots and two photo stations were established in the main section of expansion Area E. One photo station was established in the western sub-area of expansion Area E.

6.1 Wetland Expansion Area E Plant Community Monitoring

The wetland areas of wetland expansion Area E is currently dominated by Carex species and rice cut grass and is therefore a Carex-Leersia oryzoides plant community. Photographs or Area E are provided in Appendix B.

Grading work performed during the spring of 2000 significantly increased the wetland acreage within expansion Area E. Three shallow depressional areas were created that are connected to the existing natural drainage channel.

There remains approximately 0.18 acres within Area E that do not meet the ACOE wetland vegetation criteria. The two factors that appear to be responsible for the upland vegetation conditions in these areas are a rise in elevation. The non-wetland area appears to be 1 foot to 1.5 feet higher than the adjacent wetland area

The regrading performed in the western sub-section of expansion Area E also increased the acreage meeting the ACOE wetland criteria. The entire area of the western sub-section of Area E (approximately 0.15 acres) meets the ACOE wetland criteria. The vegetation appears to be healthy and thriving.

6.2 Wetland Expansion Area E Water Level Elevation Data

Shallow monitoring well and staff gage water level elevation data are provided in Table 5. The shallow monitoring well water levels and staff gage water elevations were measured bi-monthly beginning on July 17, 2003 and continued through November 2003.

The wetland expansion Area E staff gage water level data indicate that the area in the vicinity of the staff gage was inundated or saturated at the surface for over eight consecutive days during the monitoring period. Also, the shallow monitoring well ground water elevation data, depicted graphically in Figure 5 and summarized in Table 5, indicate that the ground water levels were within twelve inches of the ground surface for eight consecutive days during the growing season. The 2003 shallow monitoring well data for wetland expansion Area E (area which currently meets the hydrophytic vegetation criteria) confirms that the ACOE wetland hydrology criteria were satisfied during the growing season.

The staff gage and the shallow ground water monitoring well data indicate that the source of hydrology for wetland expansion Area E is most likely a combination of ground water and surface water. The surface water runoff for this area appears to be precipitation runoff from the area west of the landfill.

7.0 CONCLUSION

The fourth annual vegetation evaluation and photo documentation (specified in Special Condition F of the ACOE permit) was conducted on September 1, 2003.

The annual vegetation inspection and the hydrological data indicate that all of wetland expansion Area B, Area D and the western sub-section of Area E meet the ACOE jurisdictional wetland criteria. Of the 0.7 acres comprised by expansion Area E, approximately 0.52 acres meet the ACOE wetland criteria. The remaining 0.18 acres are dominated by upland vegetation and are approximately 1 foot to 1.5 feet higher in elevation than the adjacent wetland areas.

A summary of the wetland acreage is provided below:

- Expansion Area B 0.223 acres: All 0.223 acres are ACOE jurisdictional wetland.
- Expansion Area D 0.66 acres: All 0.66 acres are ACOE jurisdictional wetland.
- Expansion Area E (main section) 0.7 acres: Approximately 0.52 acres jurisdictional wetland
- Expansion Area E sub-section 0.15 acres: All 0.15 acres are ACOE jurisdictional wetland.

Total wetland acreage created is approximately 1.55 acres.

TABLES

Table 2
Fort Edward Landfill
Wetland Mitigation Monitoring
Summary Braun-Blanquet Percent Cover Value, Relative Percent Cover and Relative Percent Frequency
September 2003

	Leersia oryzoides (Rice cut grass)	Polygonum pensylanicum (Smartweed)	Euthamia graminifolia (Fragrant goldenrod)	Eupatorium perfoliatum (Boneset)	Verbena hastata (Blue Vervain)	Impatiens capensis (Jewelweed)	Carex species	Typha latifolia (Common Cattail)	Scirpus atrovirens	Lotus corniculatus (Bird foot trefoil)	Alisma subcordatum (Water plantain)	Sagittaria latifolia (Arrowhead)	Sparganium eurycarpum (Bur reed)	Scirpus validus (Soft stem rush)	Juncus diffusus	Trifolium pratense (Red clover)	Trifolium hybridum (Alsike clover)	Phleum pratense (Timothy)	Lolium perene (Annual ryegrass)	Avena sativa (Oats)	Carex vulpinoidea (Fox sedge)	Poa pratensis	Daucus carota (Wild Carrot)	Panicum species	Scirpus acutus (Hardstem Bull rush)	Salix discolor (Pussy Willow)	Bidens frondosa	Lemna Valdiviana(Duck Weed)
Wetland Indicator Status	OBL	FACW	FAC	FACW+	FACW+	FACW	FACW	OBL	OBL	FACU-	OBL	OBL	OBL	OBL	FACW+	FACU-	FACU-	FACU	FACU-	FACU	OBL	FACU	FACU	FAC	OBL	FACW	FACW	OBL
WETLAND B Overall Percent Vegetative Cover = 95%																												
Braun-Blanquet Percent Cover Value																												
Plot 1	4		2		1	1	3																					
Plot 2	3		3	2					1	2					1													
Plot 3			3			5		3																				
Sub-total	7	0	6	2	1	5	3	3	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Relative Percent Cover	**22.6**	**0.0**	**19.4**	**6.5**	**3.2**	**16.1**	**9.7**	**9.7**	**3.2**	**6.5**	**0.0**	**0.0**	**0.0**	**0.0**	**3.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Frequency [1]																												
Plot 1	1		1		1	1	1																					
Plot 2	1		1	1	1				1	1					1													
Plot 3			1			1		1																				
Relative Frequency	**66.7**	**0.0**	**100.0**	**33.3**	**66.7**	**66.7**	**33.3**	**33.3**	**33.3**	**33.3**	**0.0**	**0.0**	**0.0**	**0.0**	**33.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
WETLAND D Overall Percent Vegetative Cover = 95%																												
Braun-Blanquet Percent Cover Value																												
Plot 1								5																				
Plot 2	3							4				+													1			
Plot 3	3							3				3																
Plot 4	4							2					2												3			
Sub-total	10	0	0	0	0	0	0	14	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0
Relative Percent Cover	**30.3**	**0**	**0**	**0**	**0**	**0**	**0**	**42.4**	**0**	**0**	**0**	**9.09**	**6.061**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12.1**	**0**	**0**	**0**
Frequency [1]																												
Plot 1								1																				
Plot 2	1							1				1													1			
Plot 3	1							1				1																
Plot 4	1							1					1												1			
Relative Frequency	**75**	**0**	**0**	**0**	**0**	**0**	**0**	**100**	**0**	**0**	**0**	**50**	**25**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**50**	**0**	**0**	**0**
WETLAND E Overall Percent Vegetative Cover =95%																												
Braun-Blanquet Percent Cover Value																												
Plot 1	5							1					1															
Plot 2	4			1			3								2										1			
Plot 3							4																	3				
Plot 4							2			3								1				4					2	
Sub-total	9	0	0	1	0	0	7	1	0	3	0	0	0	0	2	0	0	1	0	0	0	4	0	3	1	0	2	0

Table 2
Fort Edward Landfill
Wetland Mitigation Monitoring
Summary Braun-Blanquet Percent Cover Value, Relative Percent Cover and Relative Percent Frequency
September 2003

	Leersia oryzoides (Rice cut grass)	Polygonum pensylanicum (Smartweed)	Eutharnia graminifolia (Fragrant goldenrod)	Eupatorium perfoliatum (Boneset)	Verbena hastata (Blue Vervain)	Impatiens capensis (Jewelweed)	Carex species	Typha latifolia (Common Cattail)	Scirpus atrovirens	Lotus corniculatus (Bird foot trefoil)	Alisma subcordatum (Water plantain)	Sagittaria latifolia (Arrowhead)	Sparganium eurycarpum (Bur reed)	Scirpus validus (Soft stem rush)	Juncus diffusus	Trifolium pratense (Red clover)	Trifolium hybridum (Alsike clover)	Phleum pratense (Timothy)	Lolium perene (Annual ryegrass)	Avena sativa (Oats)	Carex vulpinoidea (Fox sedge)	Poa pratensis	Daucus carota (Wild Carrot)	Panicum species	Scirpus acutus (Hardstem Bull rush)	Salix discolor (Pussy Willow)	Bidens frondosa	Lemna Valdiviana(Duck Weed)
Wetland Indicator Status	OBL	FACW	FAC	FACW+	FACW+	FACW	FACW	OBL	OBL	FACU-	OBL	OBL	OBL	OBL	FACW+	FACU-	FACU-	FACU	FACU-	FACU	OBL	FACU	FACU	FAC	OBL	FACW	FACW	OBL
Relative Percent Cover	26.5	0	0	2.94118	0.0	0	20.588	2.9	0	8.8235	0.0	0	0	0.0	5.9	0	0	2.9	0	0	0	11.8	0	8.8	2.9	0	5.9	0
Frequency [1]																												
Plot 1	1							1					1															
Plot 2	1			1			1								1													
Plot 3							1																	1				
Plot 4							1			1								1				1					1	
Relative Frequency	50	0	0	25	0	0	75	25	0	25	0	0	25	0	25	0	0	25	0	0	0	25	0	25	0	0	25	0

[1] - A 1 indicates the species was present a blank space indicates the species was not present

TABLE 3
FORT EDWARD LANDFILL
GROUND WATER/SURFACE WATER DATA
WETLAND AREA B

DATE	GROUND WATER DEPTH (FEET BELOW MEASURING POINT)	GROUND WATER DEPTH (FEET BELOW GROUND SURFACE)	SURFACE WATER DEPTH (INCHES OF STANDING WATER)
7/23/99	Dry	>2.4	None
8/6/99	6.45	1.85	None
8/20/99	6.87	2.27	None
9/3/99	Dry	>2.4	None
9/17/99	5.59	0.99	1
10/1/99	5.77	1.17	None
10/14/99	5.67	1.07	None
10/29/99	5.8	1.2	None
11/12/99	5.8	1.2	None
11/29/99	5.7	1.1	None
4/6/00	5.64	1.04	None*
4/20/00	5.8	1.2	None*
5/3/00	5.91	1.31	None*
5/17/00	5.96	1.36	None*
5/30/00	6.2	1.6	None*
6/14/00	5.79	1.19	None*
6/28/00	6.36	1.76	None*
7/13/00	6.84	2.24	None
7/26/00	6.62	2.02	None
8/11/00	6.36	1.76	None*
8/24/00	5.55	0.95	None*
9/6/00	6.4	1.8	None
9/28/00	6.5	1.9	None
10/5/00	5.71	1.11	2"
10/19/00	5.65	1.05	None
11/3/00	5.81	1.21	None
11/17/00	5.73	1.13	None
8/15/01	6.81	2.21	None
8/29/01	6.76	2.16	None
9/14/01	4.42	0.52	None
9/28/01	4.11	0.21	Saturated at Surface
10/11/01	4.16	0.26	Saturated at Surface
10/26/01	4.15	0.25	Saturated at Surface
11/9/01	4.18	0.28	Saturated at Surface
11/29/01	3.95	0.05	1"
7/17/03	4.8	0.9	Saturated at Surface
7/31/03	5.56	1.66	None
8/13/03	4.31	0.41	Saturated at Surface
8/29/03	5.65	1.75	None
9/12/03	5.34	1.44	None
9/25/03	4.39	0.49	Saturated at Surface
10/8/03	4.35	0.45	Saturated at Surface
10/23/03	4.35	0.45	Saturated at Surface
11/3/03	4.22	0.32	1"
11/19/03	4.22	0.32	2"
9/14/01 First water level measurement following relocation of monitoring well on August 30, 2001			

TABLE 4
FORT EDWARD LANDFILL
GROUND WATER/SURFACE WATER DATA
WETLAND AREA D

DATE	GROUND WATER DEPTH (FEET BELOW MEASURING POINT)	GROUND WATER DEPTH (FEET BELOW GROUND SURFACE)	SURFACE WATER DEPTH (INCHES OF STANDING WATER)
7/23/99	Dry	>2.2	None
8/6/99	5.5	0.73	None
8/20/99	5.99	1.22	None
9/3/99	6.2	1.43	None
9/17/99	5	0.23	9
10/1/99	5.11	0.34	4.5
10/14/99	5.04	0.27	6
10/29/99	5.1	0.33	4
11/12/99	5.12	0.35	4.25
11/29/99	5.08	0.31	5.5
4/6/00	4.51	-0.26	10
4/20/00	5.02	0.25	8
5/3/00	5.09	0.32	9
5/17/00	5.03	0.26	7.5
5/30/00	5.21	0.44	10
6/14/00	4.98	0.21	8.5
6/28/00	5.21	0.44	6.5
7/13/00	5.36	0.59	6
7/26/00	5.37	0.6	6
8/11/00	5.19	0.42	7.5
8/24/00	5.07	0.3	8
9/6/00	5.24	0.47	6
9/18/00	5.23	0.46	7
10/5/00	5.26	0.49	10
10/19/00	5.08	0.31	8
11/3/00	5.17	0.4	8
11/17/00	5.11	0.34	8
8/15/01	5.18	0.41	8
8/29/01	5.3	0.53	4.5
9/14/01	5.34	0.57	4
9/28/01	5.15	0.38	8
10/11/01	5.29	0.52	9.5
10/26/01	5.16	0.39	9
11/9/01	5.14	0.37	8
11/29/01	5	0.23	10
7/17/03	4.99	0.22	4
7/31/03	5.34	0.57	4
8/13/03	5.23	0.46	6
8/29/03	5.42	0.65	4
9/12/03	5.45	0.68	4
9/25/01	5.21	0.44	7
10/8/03	5.26	0.49	7
10/23/03	5.82	1.05	6
11/3/03	5.15	0.38	8
11/19/03	5.2	0.43	7

TABLE 5
FORT EDWARD LANDFILL
GROUND WATER/SURFACE WATER DATA
WETLAND AREA E

DATE	GROUND WATER DEPTH (FEET BELOW MEASURING POINT)	GROUND WATER DEPTH (FEET BELOW GROUND SURFACE)	SURFACE WATER DEPTH (INCHES OF STANDING WATER)
7/23/99	Dry	2.48	None
8/6/99	Dry	2.48	None
8/20/99	6.6	2.04	None
9/3/99	6.85	2.29	None
9/17/99	6.79	2.23	12
10/1/99	6	1.44	11.5
10/14/99	5.19	0.63	12
10/29/99	4.87	0.31	12
11/12/99	4.79	0.23	12
11/29/99	4.6	0.04	12.5
4/6/00	4.42	-0.14	18
4/20/00	4.45	-0.11	11.5
5/3/00	4.45	-0.11	12
5/17/00	4.51	-0.05	10.8
5/30/00	4.55	-0.01	14
6/14/00	4.47	-0.09	11.5
6/28/00	5.67	1.11	9
7/13/00	5.93	1.37	6
7/26/00	6.03	1.47	8
8/11/00	4.59	0.03	10
8/24/00	4.46	-0.1	11
9/6/00	5.16	0.6	8
9/18/00	4.93	0.37	9
10/5/00	4.5	-0.06	12
10/19/00	4.45	-0.11	11
11/3/00	4.55	-0.01	10
11/17/00	4.47	-0.09	11
8/15/01	6.45	1.89	Saturated at Surface
8/29/01	6.28	1.72	Saturated at Surface
9/14/01	6.78	2.22	None
9/28/01	5.18	0.62	Saturated at Surface
10/11/01	5.13	0.57	Saturated at Surface
10/26/01	5.25	0.69	Saturated at Surface
11/9/01	5.13	0.57	Saturated at Surface
11/29/01	4.61	0.05	2
7/17/03	5.12	0.56	Saturated at Surface
7/31/03	5.63	1.07	Saturated at Surface
8/13/03	4.63	0.07	2
8/29/03	5.9	1.34	None
9/12/03	5.52	0.96	Saturated at Surface
9/25/03	4.69	0.13	2
10/8/03	4.7	0.14	2
10/23/03	4.72	0.16	3
11/3/03	4.64	0.08	3
11/19/03	4.67	0.11	3

FIGURES

Figure 1 Fort Edwad Landfill Location

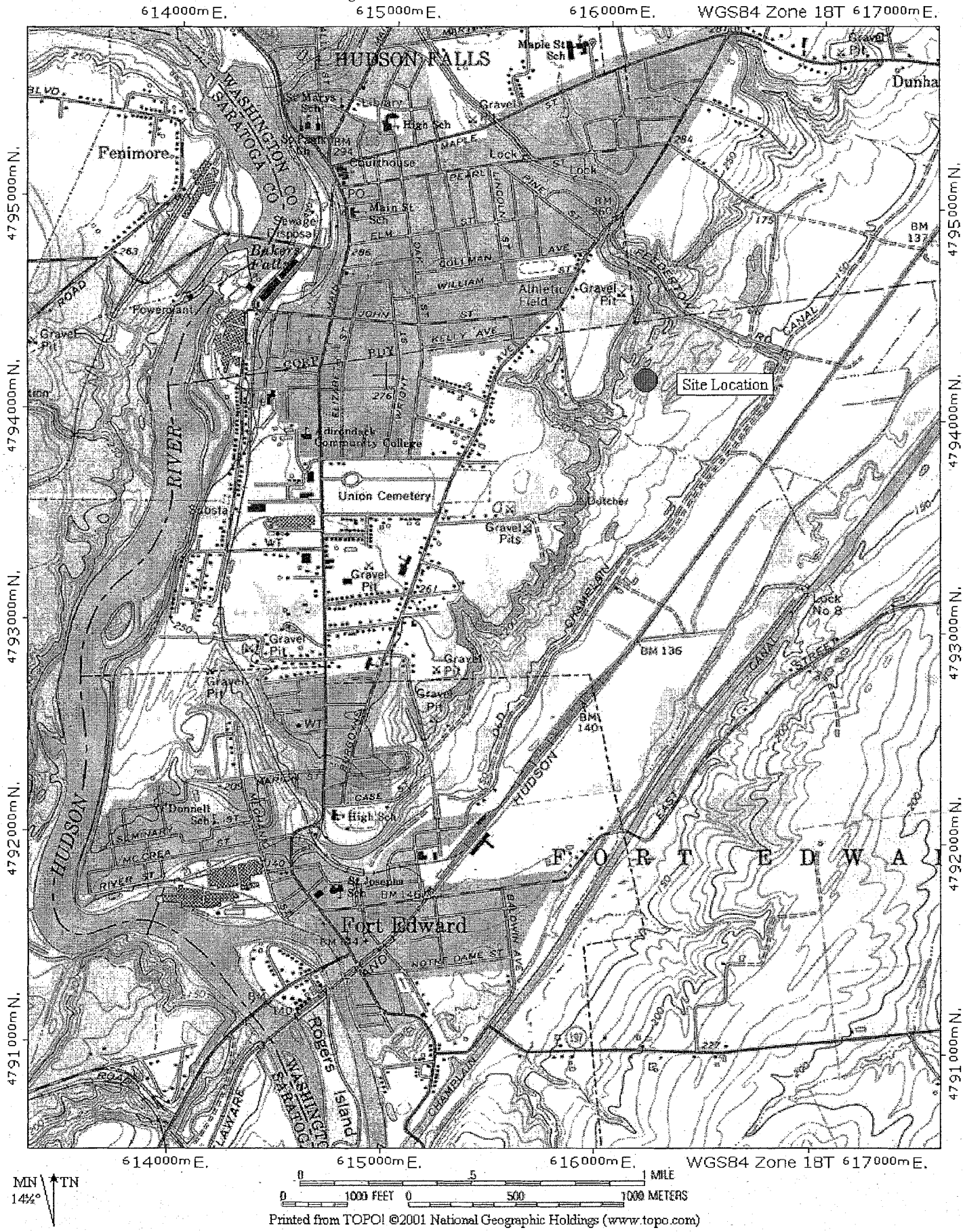

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Figure 3 Wetland B Ground Water Depth (Feet Below Ground Surface)

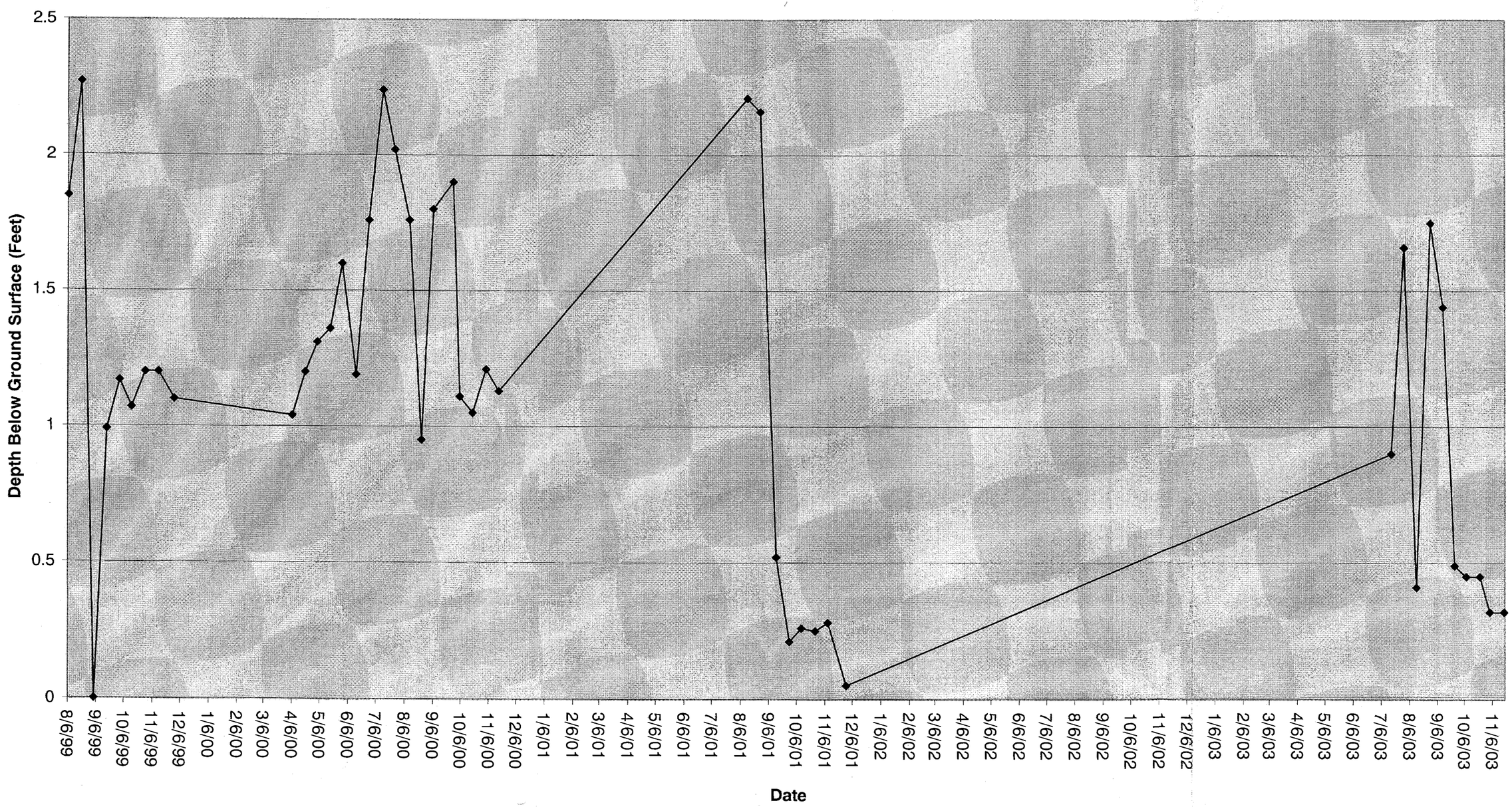
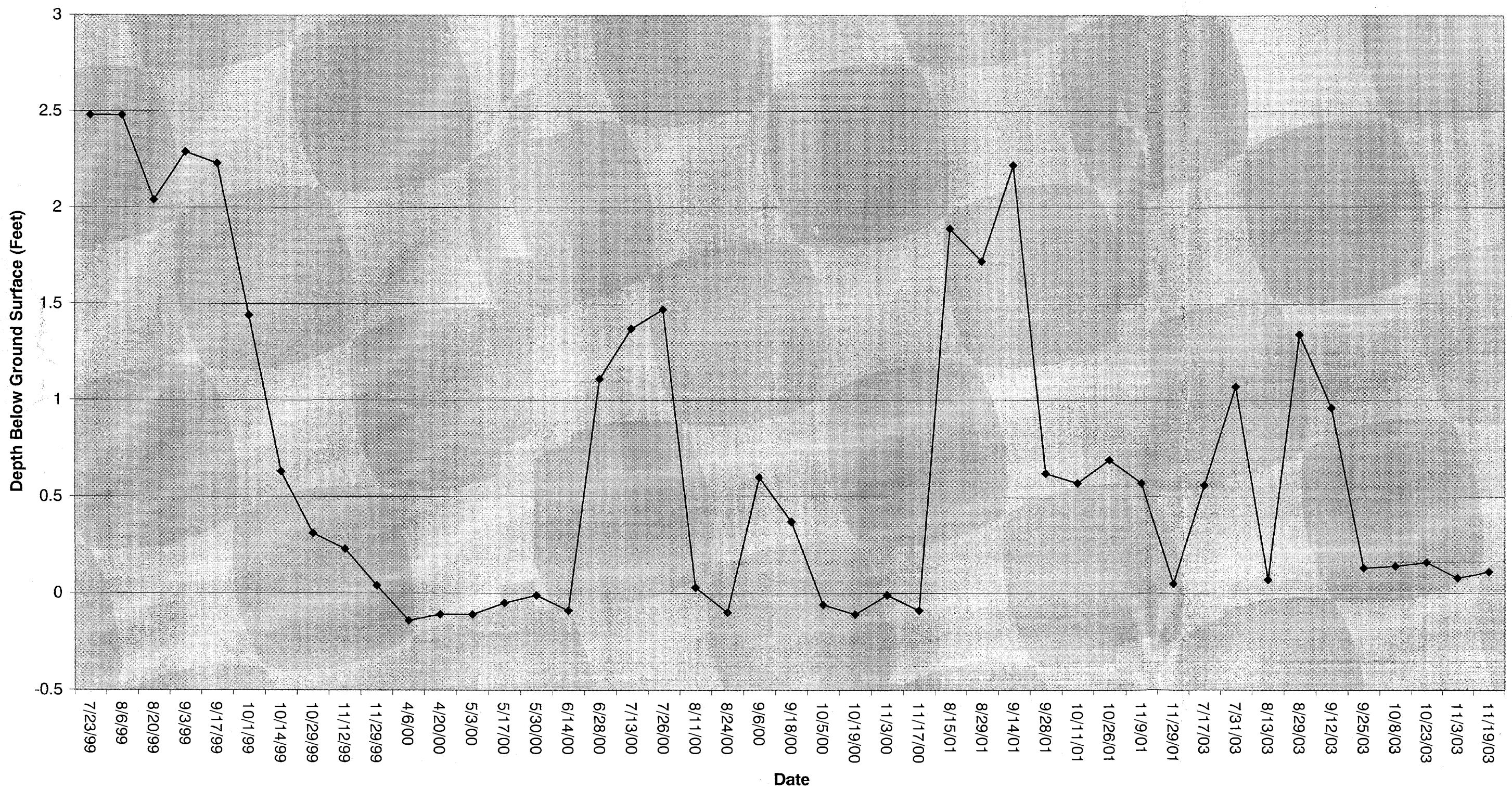


Figure 5 Wetland E Ground Water Depth (Feet Below Ground Surface)



APPENDIX A

VEGETATION FIELD DATA SHEETS

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/1/03

Transect Wetl B Plot 1 Plot Size 10 sq ft

Plant Community Leersia oryzoides – Carex lurida

Community Description Shallow Emergent Marsh / Wet Meadow

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum 100%

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Carex species	Sedge	OBL	3	20
Leersia oryzoides	Rice Cutgrass	OBL	4	300 6" patches
Verbena hastata	Blue Vervain	FACW	1	10
Impatiens capensis	Jewel weed	FACW	1	10
Euthamia graminifolia	Fragrant goldenrod	FAC	2	20

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/1/03

Transect WetB Plot 3 Plot Size 10 sq ft

Plant Community Impatiens Capensis - Typha latifolia

Community Description Shallow Emergent Marsh / wet meadow

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum 100%

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Impatiens capensis	Jewelweed	FACW	5	300 6" patches
Typha latifolia	Cattail	OBL	3	100+
Euthamia graminifolia	Fragrant goldenrod	FAC	2	25

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/1/03

Transect wetL D Plot 1 Plot Size 10 sqfeet

Plant Community Typha latifolia

Community Description Emergent Marsh

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum 95% 5% open H_2O

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Typha latifolia	Cattail	OBL	5	10 sq ft at 95%

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/1/03

Transect wetland D Plot 2 Plot Size 10 sqft

Plant Community Typha latifolia – Leersia oryzoides

Community Description Emergent Marsh

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum 100

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Typha latifolia	Cattail	OBL	4-5	200+
Sagittaria latifolia	Arrowhead	OBL	+	5
Scirpus acutus	Hardstem bulrush	OBL	1	40 6" patches
Leersia Oryzoides	Rice Cutgrass	OBL	3	100 6" patches

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/1/03

Transect Wetland D Plot 3 Plot Size 10 sq ft

Plant Community Typha latifolia – Sagittaria latifolia

Community Description Emergent Marsh

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum 100

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Sagittaria latifolia	Arrowhead	OBL	3	100
Typha latifolia	Cattail	OBL	3	175 +
Leersia oryzoides	Rice cutgrass	OBL	2	60-6" patches

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/1/03

Transect WetLB Plot 4 Plot Size 10 sqft

Plant Community Leersia oryzoides - Scirpos acutus

Community Description Shallow Emergent Marsh

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum 100

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Leersia oryzoides	Rice cutgrass	OBL	4	250 6" patches
Scirpus acutus	Hardstem Bulrush	OBL	3	100 6" patches
Typha latifolia	Cattail	OBL	2	30+
Sparganium eurycarpum	Bur reed	OBL	2	20+

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/2/03

Transect WETLE Plot 1 Plot Size 10 sq ft

Plant Community Leersia oryzoides

Community Description Shallow Emergent Marsh / Wet Meadow

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum 100

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Leersia oryzoides	Rice cutgrass	OBL	5	375 6" patches
Typha latifolia	Cattail	OBL	1	15
Sparganium eurycarpum	Bur-reed	OBL	1	22

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/1/03

Transect wetL E Plot 2 Plot Size 10 sq ft

Plant Community Leersia oryzoides - Carex

Community Description Shallow Emergent Marsh - Wet Meadow

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum 100

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Scirpus cyatus	Hardstem bulrush	OBL	2	20
Leersia oryzoides	Rice cutgrass	OBL	4	200 6" patches
Carex spp		Facw - OBL	3	100 6" patches
Juncus effusus	Soft Rush	OBL	2	50 6" patches
Eupatorium perfoliatum	Dove set	Facw+	1	10

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/1/03

Transect WetLE Plot 3 Plot Size 10 sq ft

Plant Community Carex

Community Description Wet Meadow

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum 90%

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Carex species	sedge	Facw	4	150 6" Patches
Panicum spp	grass species	Fac	3	100 6" Patches

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

DELAWARE ENGINEERING, P.C.

VEGETATION SUMMARY SHEET

Project/Project Number URS Fort Edward Landfill

Date 9/1/03

Transect WetE Plot 4 Plot Size

Plant Community Poa pratensis - Lotus corniculatus

Community Description Upland

Stratum (Circle One) Herbaceous Shrub Tree Percent Cover[1] of Stratum

Scientific Name	Common Name	Indicator Status	B-B[2] Cover Class	Estimated No. Of Individuals
Carex species	sedge	Facw	2	30 6" patches
Poa pratensis	grass	Facu	4	150 6" patches
Lotus corniculatus	Birds foot trefoil	Facu	3	100 6" patches

[1] Percent Cover = The percent of the total area that would be covered by a shadow cast from the stratum/species if the sun was directly overhead.

[2] B-B = Modified Braum-Banquet Cover Class. The class contribution to total cover is as follows: Cover Class 5 = 75% to 100%, 4 = 50% to <75%, 3 = 25% to <50%, 2 = 5% to <25%, 1 = 1% to <5%, + = <1%, R = Rare, does not contribute measurable.

APPENDIX B

PHOTOGRAPHS

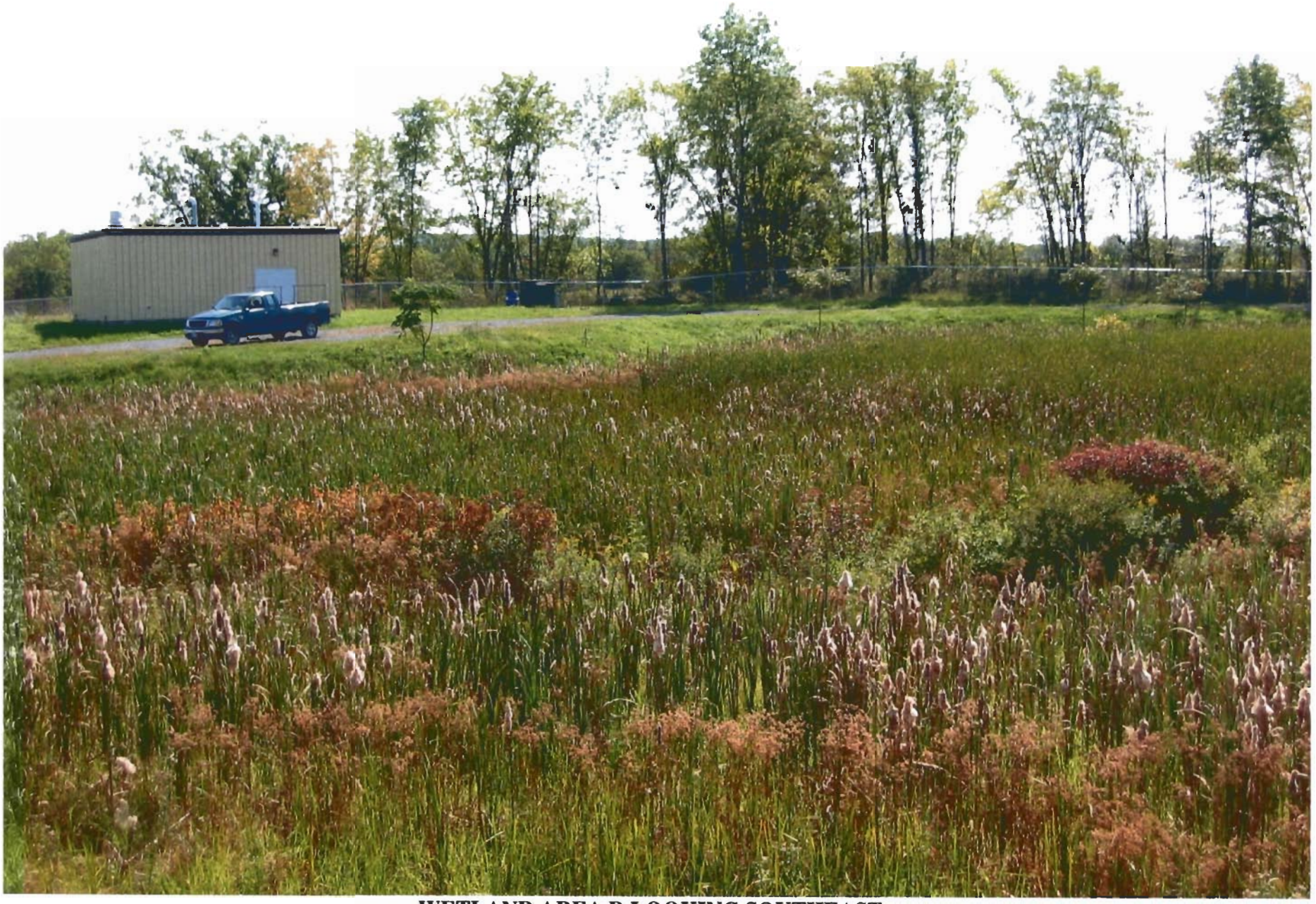
WETLAND AREA B LOOKING SOUTHEAST

WETLAND AREA B LOOKING WEST

WETLAND AREA B LOOKING SOUTH

WETLAND AREA D LOOKING WEST (SOUTH-ARM)

WETLAND AREA D LOOKING NORTH



WETLAND AREA D LOOKING SOUTHEAST

WETLAND AREA E LOOKING EAST

WETLAND AREA E LOOKING WEST

WETLAND AREA E LOOKING SOUTH

WETLAND AREA E WESTERN SUBAREA LOOKING NORTHWEST